

Universal Newborn Hearing
Screening and Early
Intervention Programme



Universal Newborn Hearing Screening and Early Intervention Programme (UNHSEIP)

**Monitoring Report on Newborn Hearing
Screening Service Provision**

April 2010 – September 2010

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1. Executive Summary

The national implementation of the Universal Hearing Screening and Early Intervention Programme (UNHSEIP) was completed in August 2010 with all 20 District Health Boards (DHBs) now offering screening to the families and whānau of newborn babies.

This monitoring report covers the six month period from 1 April 2010 to 30 September 2010. All but one DHB had implemented newborn hearing screening at the beginning of this period, and by the end all DHBs were offering screening. The first UNHSEIP monitoring report for October 2009 to March 2010 provided information on screening, but audiology information did not begin being collected until April 2010. This means that this is first monitoring report that includes both screening and audiology indicators. Tables 1 and 2 below provide a summary of the screening and audiology information contained within this report.

Key Points from April to September 2010

- This reporting period includes data from all 20 DHBs, although Southern DHB data is only from August 2010 onwards. Screening was therefore at 100% implementation by the end of this reporting period.
- At the national level within this reporting period, 85% of families and whānau were offered newborn hearing screening, compared with live birth data.
- Nationally, less than 2% of the families who were offered screening declined.
- Consents for screening when compared to live birth data identified just over three quarters (78%) of babies born in the period had consent to undertake screening.
- Of those with consent for screening, the babies prioritised ethnicities were 50% European, 26% Maori and 11% each for Asian and Pacific.
- Of those with consent for screening, a high proportion started the process (99.5%). These high rates were consistent across DHBs, ethnicities and decile groups. Similarly high rates of completion were found with an average of 99% completion, once again showing little difference across DHBs, ethnicity or decile ratings.
- In total 23,561 babies completed newborn hearing screening in this six month period. Compared with the 30,694 live births in this time, approximately 77% of babies born completed screening.
- Approximately 94% of babies completed screening by the target of one month of age (correct age). This did show variation by DHB, ranging from 66% to 99.5%. Only minor variation was seen by ethnicity and no variation by Well Baby and NICU/SCBU.
- Overall the referral rate to audiology was 2.4%, which is well within the international benchmark of 4% or less. This rate did show some variation between DHBs ranging from 0% to 6.3%. The referral rate for NICU/SCBU babies was higher at 8.6% as might be expected.

- Of those babies that passed screening 7.4% were identified for targeted follow-up. This showed a variation between DHBs and was significantly higher for babies from NICU/SCBU at 40.5%.
- Of those babies referred to audiology, 40.5% started audiology assessment. This rate varied significantly between DHBs from 0% through to 75%. This does not necessarily mean that 60% of babies have not been seen by audiology. The data is limited because some DHBs have not submitted audiology forms to the NSU, and also there are some forms that are yet to be entered into the national database due to missing information. Overall, 563 babies did not pass screening and were referred to audiology, however audiology information was recorded in the national database for just 228 of these babies.
- All babies that started audiology assessment completed the assessment, and 64% of those that completed did so within the target of completion by three months of age. Variation between DHBs, ethnicity and decile can be seen but the numbers are too small to draw any strong conclusions.
- 11 babies (4.8% of those that completed an audiology assessment) had a permanent/congenital hearing loss identified; only one of these was a NICU/SCBU baby.
- A greater percentage of babies were identified with a Conductive or Mixed, hearing loss - 24.1% of those who completed an audiology assessment.
- The age at which a hearing loss was identified is outlined in the report, numbers are small but, 9 were identified by 4 weeks, 13 by 8 weeks, 16 by 12 weeks and the remaining 27 by over 12 weeks.

Table 1a Summary of newborn hearing screening indicators by DHB, for 1 April 2010 - 30 Sept 2010

DHB of birth	Live Births	Consent for Screen	Started Screen	Completed Screening by 1 month of age	Completed Screening	Pass	Referred to Audiology	Passed with Targeted follow-up	Consents to Live Births	Started Screening to Consented for Screening	Completed Screening by 1 month to completed	Completed Screening to Consents for Screening	Referral Rate to audiology	Targeted follow-up
Northland	1157	537	532	342	518	494	24	72	46.4%	99.1%	66.0%	96.5%	4.6%	14.6%
Waitemata	3862	1886	1882	1740	1861	1838	23	115	48.8%	99.8%	93.5%	98.7%	1.2%	6.3%
Auckland	3179	3080	3063	2856	3025	2891	134	136	96.9%	99.4%	94.4%	98.2%	4.4%	4.7%
Counties Manukau	4231	2087	2082	1996	2045	1916	129	167	49.3%	99.8%	97.6%	98.0%	6.3%	8.7%
Waikato	2675	2702	2698	2574	2691	2644	47	187	101.0%	99.9%	95.7%	99.6%	1.7%	7.1%
Lakes	738	809	806	764	803	788	15	54	109.6%	99.6%	95.1%	99.3%	1.9%	6.9%
Bay of Plenty	1394	1380	1374	1297	1352	1340	12	73	99.0%	99.6%	95.9%	98.0%	0.9%	5.4%
Tairāwhiti	341	359	357	342	350	347	3	22	105.3%	99.4%	97.7%	97.5%	0.9%	6.3%
Taranaki	764	766	765	666	753	736	17	82	100.3%	99.9%	88.4%	98.3%	2.3%	11.1%
Hawke's Bay	1058	1122	1118	1097	1117	1096	21	96	106.0%	99.6%	98.2%	99.6%	1.9%	8.8%
Whanganui	424	407	406	354	403	394	9	38	96.0%	99.8%	87.8%	99.0%	2.2%	9.6%
Mid Central	1168	632	632	525	632	618	14	76	54.1%	100.0%	83.1%	100.0%	2.2%	12.3%
Hutt Valley	1038	1096	1088	1079	1084	1072	12	148	105.6%	99.3%	99.5%	98.9%	1.1%	13.8%
Capital & Coast	1930	1858	1857	1827	1856	1847	9	143	96.3%	99.9%	98.4%	99.9%	0.5%	7.7%
Wairarapa	247	194	193	188	193	192	1	14	78.5%	99.5%	97.4%	99.5%	0.5%	7.3%
Nelson Marlborough	844	800	789	708	779	771	8	66	94.8%	98.6%	90.9%	97.4%	1.0%	8.6%
West Coast	209	127	126	119	125	125	0	13	60.8%	99.2%	95.2%	98.4%	0.0%	10.4%
Canterbury	3231	3067	3064	2847	3045	2981	64	130	94.9%	99.9%	93.5%	99.3%	2.1%	4.4%
South Canterbury	318	314	312	307	311	307	4	14	98.7%	99.4%	98.7%	99.0%	1.3%	4.6%
Southern	1753	666	635	531	618	601	17	50	38.0%	95.3%	85.9%	92.8%	2.8%	8.3%
Total	30,694	23,889	23,779	22,159	23,561	22,998	563	1,696	77.8%	99.5%	94.0%	98.6%	2.4%	7.4%

Table 1b Summary of newborn hearing screening indicators by Ethnicity, Deprivation and Birth Location for 1 April 2010 - 30 Sept 2010

DHB of Birth	Consent for Screen	Started Screen	Completed Screening by 1 month of age	Completed Screening	Pass	Referred to Audiology	Passed with Targeted follow-up	Started Screening to Consented for Screening	Completed Screening by 1 month to completed	Completed Screening to Consents for Screening	Referral Rate to audiology	Targeted follow-up
Ethnicity												
Maori	6149	6120	5606	6039	5872	167	540	99.5%	92.8%	98.2%	2.8%	9.2%
Pacific	2597	2584	2429	2543	2432	111	160	99.5%	95.5%	97.9%	4.4%	6.6%
Asian	2708	2698	2582	2685	2613	72	115	99.6%	96.2%	99.2%	2.7%	4.4%
European	11845	11790	10983	11711	11514	197	845	99.5%	93.8%	98.9%	1.7%	7.3%
Unspecified	30	30	30	30	30	0	2	100.0%	100.0%	100.0%	0.0%	6.7%
Other ethnic groups	560	557	529	553	537	16	34	99.5%	95.7%	98.8%	2.9%	6.3%
Total	23,889	23,779	22,159	23,561	22,998	563	1,696	99.5%	94.0%	98.6%	2.4%	7.4%
Deprivation												
Decile 1-2	3399	3385	3201	3362	3304	58	235	99.6%	95.2%	98.9%	1.7%	7.1%
Decile 3-4	3657	3641	3385	3611	3541	70	222	99.6%	93.7%	98.7%	1.9%	6.3%
Decile 5-6	4508	4489	4186	4454	4368	86	288	99.6%	94.0%	98.8%	1.9%	6.6%
Decile 7-8	5742	5713	5292	5664	5527	137	438	99.5%	93.4%	98.6%	2.4%	7.9%
Decile 9-10	6570	6538	6082	6457	6245	212	513	99.5%	94.2%	98.3%	3.3%	8.2%
Unknown	13	13	13	13	13	0	0	100.0%	100.0%	100.0%	0.0%	0.0%
Total	23,889	23,779	22159	23561	22998	563	1,696	99.5%	94.0%	98.6%	2.4%	7.4%
Birth Location												
Public Hospital	23406	23299	21786	23087	22535	552	1661	99.5%	94.4%	98.6%	2.4%	7.4%
Private Hospital	92	91	87	91	90	1	3	98.9%	95.6%	98.9%	1.1%	3.3%
Home	374	372	271	366	356	10	29	99.5%	74.0%	97.9%	2.7%	8.1%
Other Location	17	17	15	17	17	0	3	100.0%	88.2%	100.0%	0.0%	17.6%
Total	23,889	23,779	22,159	23,561	22,998	563	1,696	99.5%	94.0%	98.6%	2.4%	7.4%

Table 2a Summary of newborn hearing audiology indicators by DHB for 1 April 2010 - 30 Sept 2010

DHB of audiology	Commenced Audiology	Completed Audiology	Completed Audiology in 3 months	Permanent /Congenital Hearing Loss	Conductive /Mixed Hearing Loss		Completed Audiology From commenced	Completed Audiology in 3 months from completed audiology	Permanent /Congenital Hearing Loss from completed	Conductive/Mixed hearing loss from completed
Northland	9	9	6	0	3		100.0%	66.7%	0.0%	33.3%
Waitemata							-			
Auckland	24	24	12	1	2		100.0%	50.0%	4.2%	8.3%
Counties Manukau	60	60	20	1	16		100.0%	33.3%	1.7%	26.7%
Waikato	31	31	23	2	12		100.0%	74.2%	6.5%	38.7%
Lakes	1	1	0	0	0		100.0%	0.0%	0.0%	0.0%
Bay of Plenty	7	7	7	0	2		100.0%	100.0%	0.0%	28.6%
Tairāwhiti	2	2	2	1	0		100.0%	100.0%	50.0%	0.0%
Taranaki	14	14	14	0	1		100.0%	100.0%	0.0%	7.1%
Hawke's Bay							-			
Whanganui							-			
Mid Central	9	9	6	0	1		100.0%	66.7%	0.0%	11.1%
Hutt Valley	7	7	7	0	0		100.0%	100.0%	0.0%	0.0%
Capital & Coast	2	2	0	1	0		100.0%	0.0%	50.0%	0.0%
Wairarapa							-			
Nelson Marlborough	3	3	2	1	0		100.0%	66.7%	33.3%	0.0%
West Coast							-			
Canterbury	45	45	38	4	12		100.0%	84.4%	8.9%	26.7%
South Canterbury	3	3	3	0	0		100.0%	100.0%	0.0%	0.0%
Southern	11	11	6	0	6		100.0%	54.5%	0.0%	54.5%
Total	228	228	146	11	55		100.0%	64.0%	4.8%	24.1%

- Indicates no figure included usually due to no babies progressing to this stage and percentages therefore not being meaningful.

Table 2b Summary of newborn hearing audiology indicators by Ethnicity, Deprivation and Birth Location for 1 April 2010 - 30 Sept 2010

	Commenced Audiology	Completed Audiology	Completed Audiology in 3 months	Permanent /Congenital Hearing Loss	Conductive /Mixed Hearing Loss		Completed Audiology From commenced	Completed Audiology in 3 months from completed audiology	Permanent /Congenital Hearing Loss from completed	Conductive/Mixed hearing loss from completed
Ethnicity										
Maori	64	64	40	4	18		100.0%	62.5%	6.3%	28.1%
Pacific	34	34	10	1	9			29.4%	2.9%	26.5%
Asian	26	26	13	1	6		100.0%	50.0%	3.8%	23.1%
European	98	98	78	5	21		100.0%	79.6%	5.1%	21.4%
Other ethnic groups	6	6	5	0	1		100.0%	83.3%	0.0%	16.7%
Total	228	228	146	11	55		100.0%	64.0%	4.8%	24.1%
Deprivation										
Decile 1-2	21	21	17	1	4		100.0%	81.0%	4.8%	19.0%
Decile 3-4	35	35	24	1	9			68.6%	2.9%	25.7%
Decile 5-6	43	43	27	2	11		100.0%	62.8%	4.7%	25.6%
Decile 7-8	51	51	41	2	15		100.0%	80.4%	3.9%	29.4%
Decile 9-10	78	78	37	5	16		100.0%	47.4%	6.4%	20.5%
Total	228	228	146	11	55		100.0%	64.0%	4.8%	24.1%
Birth Location										
Public Hospital	221	221	141	10	53		100.0%	63.8%	4.5%	24.0%
Private Hospital	0	-	-	-	-		-	-	-	-
Home	7	7	5	1	2		100.0%	71.4%	14.3%	28.6%
Total	228	228	146	11	55		100.0%	64.0%	4.8%	24.1%

Summary of Recommendations

OFFER OF SCREENING

1. The National Screening Unit to follow-up with Waitemata, Counties Manukau, MidCentral and West Coast DHBs about their offer of screening figures.
2. All DHBs are to be requested to provide the total number of live births within their DHB for future reports.

CONSENT FOR SCREENING

3. The National Screening Unit to follow-up with Northland DHB about their consent for screening figure.

DECLINE OF SCREENING

4. The National Screening Unit to follow-up with Northland and Southern DHBs about their decline of screening figures, including breakdown by ethnicity.

NEWBORN HEARING SCREENING STARTED

5. DHBs are to be congratulated on their achievements regarding the high proportion of screening started compared with consent to screening.

NEWBORN HEARING SCREENING COMPLETED

6. The National Screening Unit to follow-up with Northland, Taranaki, Whanganui, MidCentral and Southern DHBs about their newborn hearing screening completed by one month of age figures.

REFERRAL TO AUDIOLOGY

7. The National Screening Unit to list DHBs by their NICU service level in the next monitoring report.

TARGETED FOLLOW-UP

8. The National Screening Unit to follow-up with Northland, Taranaki, MidCentral, Hutt Valley and West Coast about their proportion of targeted follow-up.

AUDIOLOGY ASSESSMENT COMPLETED

9. The National Screening Unit to follow-up with Northland, Auckland, Counties Manukau, Waikato, MidCentral, Capital and Coast, Nelson Marlborough, Canterbury and Southern DHBs about their audiology assessment completed by three months figures.

2. Introduction

2.1. The Universal Newborn Hearing Screening and Early Intervention Programme

Universal newborn hearing screening is the standard of care internationally, and has now been introduced in New Zealand. The early detection of hearing loss, and the application of appropriate medical and educational interventions, has been demonstrated to significantly improve the baby's long-term language skills and cognitive ability.

New Zealand's Universal Newborn Hearing Screening and Early Intervention Programme (UNHSEIP) was implemented over a three year period 2007 – 2010. The UNHSEIP is jointly overseen by two Government agencies, the Ministries of Health and Education. The Ministry of Health has responsibility for screening, audiology diagnosis of hearing loss and medical interventions, and the Ministry of Education has responsibility for Early Intervention Services.

District Health Boards (DHBs) are the main providers of newborn hearing screening, follow-up audiology services, and medical interventions. Newborn hearing screening must be offered to the family/whānau of all eligible babies born in a DHB region, whether they are born in hospital or at home, within a framework of nationally consistent policies, standards and guidelines.

2.2. Programme Monitoring

The aim of the UNHSEIP is for the early identification of newborns with hearing loss, so that they can access timely and appropriate interventions, inequalities are reduced and the outcomes for these children, their families and whānau, communities and society are improved. The core goals of the UNHSEIP are described as “1-3-6” goals which are based on international benchmarks:

1. Babies to be screened by 1 month of age
3. Audiology assessment to be completed by 3 months of age
6. Initiation of appropriate medical and audiological services, and Early Intervention education services, by 6 months of age.

In 2007, a Monitoring Framework, centred around the Programme goals, was developed (<http://www.nsu.govt.nz/health-professionals/3824.aspx>). A Monitoring Framework is a plan for the routine, systematic collection and recording of information about aspects of the Programme over time. The purpose is to assess whether progress is being made on achieving the Programme goals. For this reporting period, the UNHSEIP was not fully implemented in all DHB's and it is recognised that performance will improve over time.

Monitoring is a core aspect of quality improvement activities, which are concerned with maximising the likelihood that the day-to-day operations of the screening programme will deliver the expected outcomes.

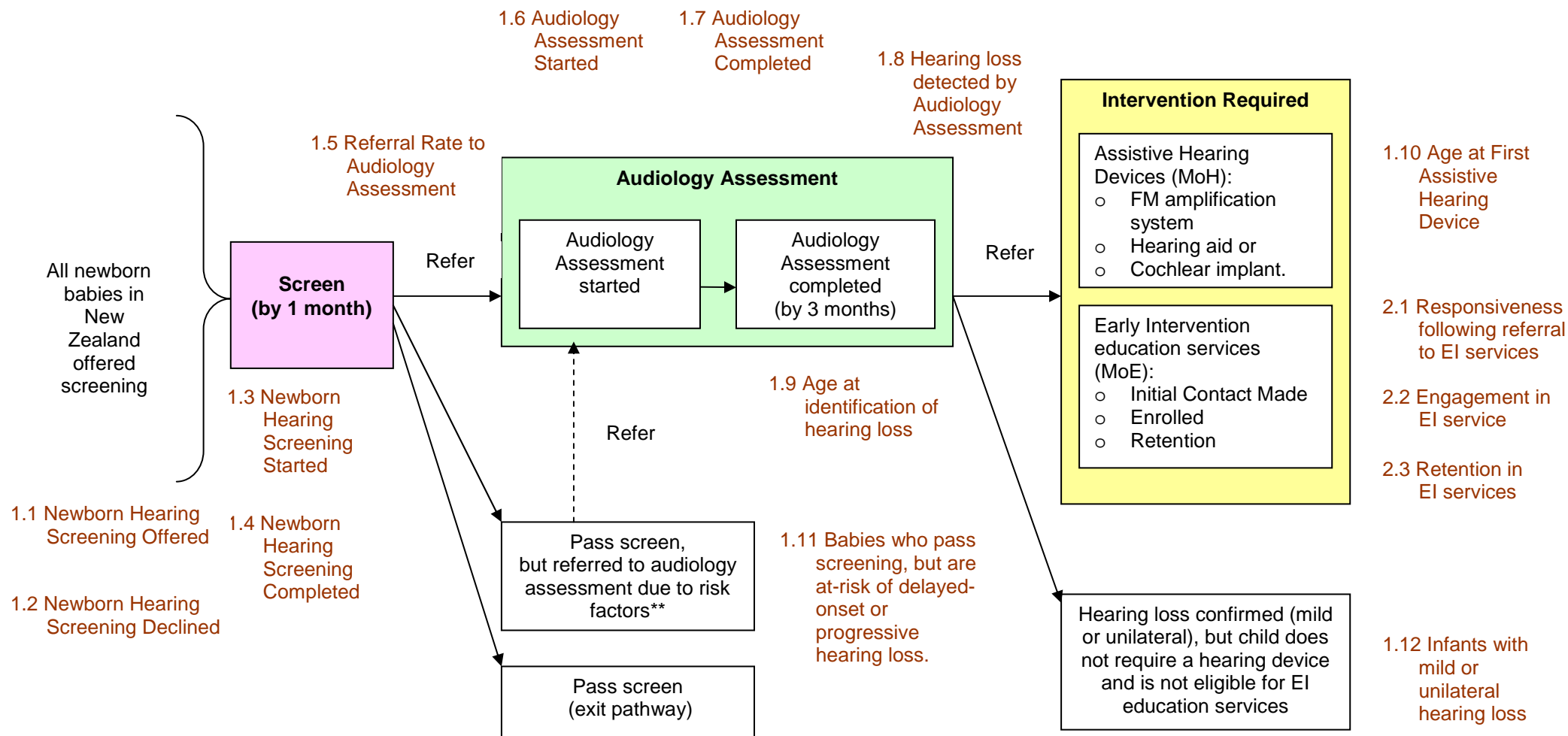
Routine monitoring, based on newborn hearing screening and audiology data provided to the Ministry by DHBs, will be reported on a quarterly basis. Quarterly monitoring will focus on babies who have screening, and their outcomes.

Annual reporting will be at a higher level, and incorporate other aspects of the Programme such as audiology and Early Intervention information. The full UNHSEIP screening pathway and associated indicators, as depicted in Figure 1, will be the basis of annual reporting.

This report, which is based on the data of babies who were screened during the six month period 1 April 2010 though to 30 September 2010, covers the following indicators:

- 1.1 Newborn Hearing Screening Offered
- 1.2 Newborn Hearing Screening Declined
- 1.3 Newborn Hearing Screening Started
- 1.4 Newborn Hearing Screening Completed
- 1.5 Referral Rate to Audiology Assessment
- 1.6 Audiology Assessment Started
- 1.7 Audiology Assessment Completed
- 1.8 Hearing Loss Detected by Audiology Assessment
- 1.9 Age at Identification of Hearing Loss
- 1.11 Babies who Pass Screening but are at risk of delayed onset or progressive hearing loss.

Figure 1 The UNHSEIP Screening Pathway and Indicators



**These babies passed screening, however it is recommended that they have “targeted follow-up” as they may be at-risk of delayed-onset or progressive hearing loss. While targeted follow-up is outside the primary screening pathway, it is recommended that these babies have at least one audiology assessment by the time they are 18 months of age.

3. Data

3.1. Data Collection Process

Screening and audiology information is collected and recorded on paper forms by newborn hearing screening providers. The paper forms are regularly submitted to the Ministry of Health's National Screening Unit (NSU) and the data is entered into the NSU's web-based application/database. The start date for entering newborn hearing screening information was for babies born from 1 October 2009 onwards, however the audiology form was not implemented until April/May 2010. Therefore this report includes the first available audiology information.

Data, for babies who started screening during the reporting period, is extracted from the NSU's web-based application via an Oracle package. Deprivation data is added to the screening data from the Ministry of Health's National Health Index database. Then the NSU systematically checks the data for missing values and discrepancies. There are 32 business rules applied to ensure the data reported on is of the highest quality. The data extract is produced in a tabular format, which is then analysed against the monitoring indicators and presented as tables and/or charts.

At this time, additional information for monitoring is sourced from quarterly DHB contractual reporting. This information is used to monitor trends in offer and decline of newborn hearing screening, as only information from babies with consent is recorded in the national database.

3.2. Information Included in this Report

The information reported is from newborn hearing screening forms where the date of screening started was between 1 April 2010 and 30 September 2010.

Participating District Health Boards 1 April 2010 – 30 September 2010

The information in this report relates to all 20 DHBs for which screening activity was recorded in the national database for the period 1 April 2010 to 30 September 2010. Out of the 20 DHBs two were new at the beginning of this period, Northland and Wairarapa, and one, Southern, started towards the end of this period as detailed in Table 3. The data for Southern, while included for completeness, should not have any conclusions drawn about it being only partial data for the period.

Table 3: DHBs Participating in UNHSEIP April to September 2010

DHB	Screening for this period	Start date of implementation
Northland	Yes	April 2010
Waitemata	Yes	late March 2010
Auckland	Yes	late March 2010
Counties Manukau	Yes	late March 2010
Waikato	Yes	July 2007
Lakes	Yes	March 2009
Bay of Plenty	Yes	March 2009
Tairāwhiti	Yes	July 2007
Taranaki	Yes	April 2009
Hawke's Bay	Yes	July 2007
Whanganui	Yes	June 2009
Mid-Central	Yes	February 2010
Wairarapa	Yes	April 2010
Hutt Valley	Yes	July 2009
Capital & Coast	Yes	June 2009
Nelson Marlborough	Yes	late March 2010
West Coast	Yes	December 2009
Canterbury	Yes	May 2009
South Canterbury	Yes	April 2009
Southern	Partial	August 2010

Audiology assessment

This is the first report to include audiology assessment information. The audiology form was not implemented until April/May 2010 (the beginning of this reporting period). The data provided to date is limited, however it is important to start this type of monitoring. Audiology data is limited because some DHBs did not submit forms, and also some forms were unable to be entered into the national database due to missing information. This report includes audiology information on 228 of the 563 babies that were referred for audiology assessment.

Early intervention education services

This report does not include information on the early intervention education service. Early intervention information will be included in annual reporting, as its goal of "initiation by 6 months of age" is not suited for quarterly monitoring. Annual reporting will be a more useful way of portraying this information.

3.3. Ethnicity Reporting

Ethnicity data in this report is grouped according to a prioritised system. This is a common method of ethnicity reporting across the health sector. Prioritised ethnic groups involve each person being allocated to a single ethnic group, based on the ethnicities they have identified with, in the prioritised order of Māori, Pacific, Asian, European and Other. For example, if someone identifies as being European and Māori, under the prioritised ethnic group method, they are classified as Māori for the purpose of the analysis.

Ethnicity data prioritisation means that the group of prioritised Other effectively refers to non-Māori, non-Pacific, non-Asian, non-European people. The aim of prioritisation is to ensure that where some need exists to assign people to a single ethnic group, ethnic groups of policy importance, or of small size, are not overwhelmed by the European ethnicity.

People may identify with as many ethnic groups as they choose. Within this population of babies, the maximum number of ethnicities recorded for eleven babies was five. Four ethnicities were recorded for 108 babies and three ethnicities were recorded for 3% of babies (n=777). Two ethnicities were recorded for 22% of babies (n=5183) and the remaining almost 75% of babies had only one ethnicity recorded.

3.4. Deprivation Index

The deprivation index is the average level of deprivation of people living in an area at a particular point in time, relative to the whole of New Zealand. Deprivation refers to areas (based on New Zealand Census meshblocks) rather than individuals. Nine indicators are combined to give the deprivation index. The indicators reflect aspects of material and social deprivation, and the nine indicators are:

- income derived from benefits
- unemployment
- low income earning
- access to car
- access to telephone
- sole-parent families
- lack of formal educational qualifications
- level of home ownership
- living space within a home.

In the deprivation index system used by the health sector, areas classified as Decile 1-2 have the least deprivation and areas classified as Decile 9-10 have the most deprivation. This is opposite to some other systems of classification such as that used by education, where level 10 is the least disadvantaged and level 1 the most disadvantaged.

3.5. Known Data Quality Issues in this Report

The following data quality issues should be considered when interpreting the data presented in this publication.

Gestational age

Where gestational age was not recorded, a gestational age of 40 weeks was allocated (2% of records, n=522). DHBs will be encouraged to include the correct gestational age on the data forms, as this is an important field. For babies born at less than full term, corrected age was calculated for the reporting of screening completed by one month of age and audiology completed by three months.

Accuracy of reporting

Data is manually entered into the national database from hand written screening forms. The potential for errors in data entry is minimised by a two step data checking process one at data entry and the other during data processing. An example of this is that a birth date of 16 July 1980 would not be allowed. Each record must contain a value in twelve mandatory fields to be included in reporting. These fields are:

- valid NHI number
- consent = yes
- valid birth date
- screening protocol
- birth location
- DHB of birth
- ethnicity
- screening outcome
- DHB of screening test 1
- DHB audiology test
- test Method 1.

All newborn hearing screening providers are responsible for maintaining a high quality of data. Although the National Screening Unit monitors the quality of the information, newborn hearing screening providers are also expected to have quality control mechanisms in place. During the data entry process, quality issues, such as missing information, were raised with DHBs, and data quality continues to improve.

Denominator

For the purpose of this report, birth data from Statistics New Zealand is used. This is based on live birth registrations and is sourced from the Births, Deaths and Marriages Register. The denominator for this report is Statistics New Zealand live births for the period 1 April 2010 – 30 September 2010 provided by the National Collections team of the Ministry of Health. At this time, this is the only source of a denominator that is available in a timely manner – it is released about 8 weeks after the close of the quarter. Other denominator sources have a lag time of 6-12 months, which is not useful. The limitations of this denominator are discussed further under sections 4.1 and 4.2.

4. Monitoring Indicators

1.1 Newborn hearing screening offered
Description The proportion of parents / guardians of eligible newborns offered newborn hearing screening.
Relevant outcome The UNHSEIP has a principle of “universality”: that all parents / guardians of eligible newborns should be offered newborn hearing screening. A high screen offered rate should result in high screening uptake rate.
methodology <i>Indicator 1.1</i> Numerator: Number of eligible newborns offered screening. Denominator: Number of eligible live births.
notes <ul style="list-style-type: none">• It is recognised that newborn hearing screening programmes do not usually achieve high coverage in the early stages of implementation. Additionally, programmes often have a phased implementation such as screening of hospital births occurring first, followed by implementation in the community. As a result, a percentage outcome target was not set at this stage of the programme.• The UNHSEIP will regularly review coverage data for this indicator. If the goal of “All” is not being achieved, then the UNHSEIP will work collaboratively with DHBs and negotiate targets in order to improve coverage.

4.1. Offer of Newborn Hearing Screening

At this time, the offer of newborn hearing screening is reported through DHB contractual reporting to the Ministry. This is because only babies with informed consent for screening can be recorded on the national database – families who do not consent, and those who are not offered screening, are not recorded in the national database. In the future, if a coordinated electronic system for maternity and newborn notes is in place, the offer of screening will be able to be nationally recorded.

The information reported in Table 4 is not from the national database extract, it is sourced from DHB quarterly reports. However reporting on the offer of screening will enable the monitoring of trends over time. In the 20 DHBs who submitted quarterly reports, 84.7% of babies were offered newborn hearing screening. Southern DHB began implementation towards the end of this reporting period so the percentage offered is lower overall. The other DHB's with low offer percentages began screening in early 2010 were Waitemata, Counties Manukau and MidCentral. The relatively low offer rates on the West Coast (79.9%) is an increase on the last six month period but is still lower than many other DHBs.

Table 4 Offer of Screening by DHB for April to September 2010

DHB	Offered Screening	Live Births	Percentage Offered
Northland	961	1157	83.1
Waitemata	1731	3862	44.8
Auckland	3421	3179	107.6
Counties Manukau	2737	4231	64.7
Waikato	2788	2675	104.2
Lakes	874	738	118.4
Bay of Plenty	1489	1394	106.8
Tairāwhiti	384	341	112.6
Taranaki	833	764	109.0
Hawkes Bay	1064	1058	100.6
Whanganui	463	424	109.2
Midcentral	616	1168	52.7
Hutt Valley	1133	1038	109.2
Capital & Coast	1927	1930	99.8
Wairarapa	225	247	91.1
Nelson Marlborough	898	844	106.4
West Coast	167	209	79.9
Canterbury	3153	3231	97.6
South Canterbury	324	318	101.9
Southern	796	1753	45.4
Total	25,984	30,694	84.7

Challenges in reporting on the offer of newborn hearing screening

The number of babies offered screening within a reporting period can be greater than the number of live births attributed to the DHB, leading to the percentage offered being more than 100%. One contributing factor is that live

births are reported based on the baby's DHB of residence, and sometimes babies may be offered screening at a different DHB. The local over (and under) proportions should balance out at regional and national levels.

Another issue for periodic reporting is that babies offered screening may have been born outside of the reporting period. For example a baby born in September may be offered screening in October, but this birth will not be included in the denominator. Annual reporting will be based on babies born within a one year period, which will improve reporting against the denominator.

Progress with national implementation

During this six month period, there were 30,694 live births recorded, distributed by DHB as shown in Figure 2. At this time, at a national level, newborn hearing screening has been implemented by all DHBs though two began implementing at the beginning of this reporting period, and one during.

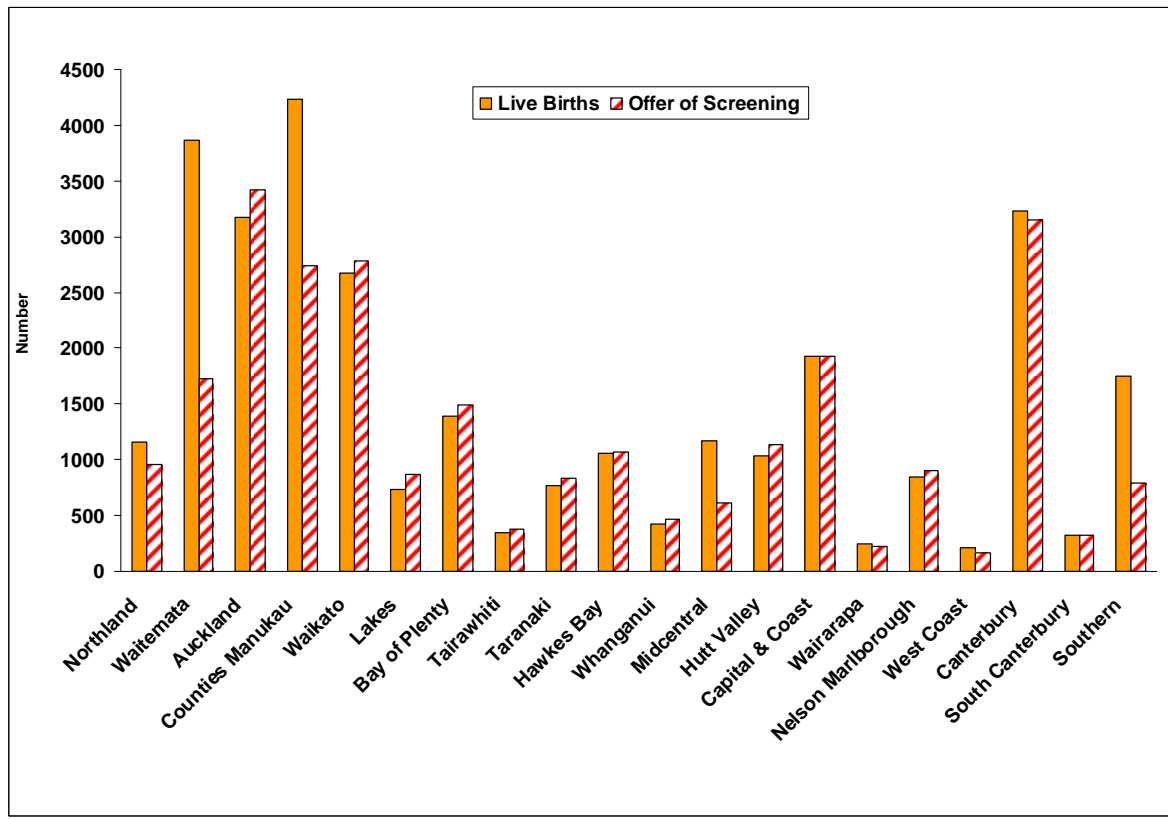


Figure 2 Number of live births by DHB for April to September 2010 (n=30,694) compared with the number of offers of screening by DHBs

RECOMMENDATIONS ON OFFER OF SCREENING

1. The National Screening Unit to follow-up with Waitemata, Counties Manukau, MidCentral and West Coast DHBs about their offer of screening figures.
2. All DHBs are to be requested to provide the total number of live births within their DHB for future reports.

4.2. Consent for Newborn Hearing Screening

Monitoring the proportion of families and whanau consenting to newborn hearing screening is a way of looking at screening coverage. All babies with informed consent for newborn hearing screening are captured in the national database. This information is compared with live births by DHB, to enable the proportion of families who consent to newborn hearing screening to be monitored. While this does not allow the separation of declines from those who were not offered screening, this information is important for monitoring trends over time.

The low percent of consents to live births for Southern (Table 5) is because the DHB was at the beginning of implementing newborn hearing screening. These data have been included in the table for completeness of reporting, however no conclusions should be drawn as this is not a complete data set for this period.

Other DHB's that had low proportions of consents for screening to live births were Northland (46.4%), Waitemata (48.8%), Counties Manukau (49.3%), MidCentral (54.1%) and West Coast (60.8%). The remaining DHBs were all above 94% of consents to live births, with the exception of Wairarapa (78.5%).

Table 5 Consents for Newborn Hearing Screening by DHB, April to September 2010

DHB	Consents for Screening	Live Births	% consents to Live Births
Northland	537	1157	46.4%
Waitemata	1,886	3862	48.8%
Auckland	3,080	3179	96.9%
Counties Manukau	2,087	4231	49.3%
Waikato	2,702	2675	101.0%
Lakes	809	738	109.6%
Bay of Plenty	1,380	1394	99.0%
Tairāwhiti	359	341	105.3%
Taranaki	766	764	100.3%
Hawke's Bay	1,122	1058	106.0%
Whanganui	407	424	96.0%
Mid Central	632	1168	54.1%
Hutt Valley	1,096	1038	105.6%
Capital & Coast	1,858	1930	96.3%
Wairarapa	194	247	78.5%
Nelson Marlborough	800	844	94.8%
West Coast	127	209	60.8%
Canterbury	3,067	3231	94.9%
South Canterbury	314	318	98.7%
Southern	666	1753	38.0%
Total	23,889	30,694	77.8%

The DHB of a baby's birth is used as the parameter for data extraction, as the denominator sourced from Statistics New Zealand is based on where the baby is born. However, DHB screening activity is reported based on babies who are screened within the DHB, which can be different to the DHB of birth. A comparison of DHB of birth with DHB of screening is shown in Table 6. This information indicates that at this time, only a small proportion of babies are screened in a different DHB to where they were born.

The proportion of babies screened at other than the DHB of birth is small and is generally 2% or less. Babies born in MidCentral and Auckland had around 3% of screens at another DHB but this difference is too small to take any strong inference from. This matter has been discussed previously by the Advisory Group, and it was agreed that for monitoring purposes, reporting should continue to use DHB of baby's birth as the parameter for data extraction. All tables in this report refer to DHB of babies birth unless otherwise stated.

Table 6 Comparison of DHB of birth with DHB of screening, April to September 2010

DHB of birth	Total consents for screening	DHB of screening	Number of babies
Northland	537	Northland	537
Waitemata	1886	Auckland	28
		Canterbury	2
		Hawke's Bay	1
		Wairarapa	1
		Waitemata	1,854
Auckland	3,080	Auckland	3,002
		Canterbury	1
		Capital & Coast	3
		Counties Manukau	6
		Hutt Valley	1
		Lakes	3
		Mid Central	1
		Northland	2
		Southern	2
		Tairāwhiti	1
		Taranaki	2
		Waikato	6
		Waitemata	49
		Whanganui	1
Counties Manukau	2,087	Auckland	10
		Counties Manukau	2,069
		Hawke's Bay	2
		Lakes	2
		Nelson Marlborough	1
		Taranaki	1
		Waikato	2
Waikato	2,702	Bay of Plenty	4
		Capital & Coast	1
		Hutt Valley	2
		Lakes	10
		Mid Central	1
		Tairāwhiti	3
		Taranaki	1
		Waikato	2,680

DHB of birth	Total consents for screening	DHB of screening	Number of babies
Lakes	809	Bay of Plenty	1
		Hawke's Bay	1
		Lakes	804
		Tairāwhiti	1
		Waikato	2
Bay of Plenty	1,380	Bay of Plenty	1,366
		Lakes	1
		Waikato	12
		Whanganui	1
Tairāwhiti	359	Bay of Plenty	1
		Hawke's Bay	1
		Tairāwhiti	356
		Waikato	1
Taranaki	766	Taranaki	766
Hawke's Bay	1,122	Canterbury	1
		Capital & Coast	1
		Hawke's Bay	1,117
		Mid Central	2
		Waikato	1
Whanganui	407	Hawke's Bay	1
		Mid Central	1
		Waikato	1
		Whanganui	404
Mid Central	632	Capital & Coast	1
		Hawke's Bay	1
		Hutt Valley	1
		Mid Central	611
		Nelson Marlborough	1
		Whanganui	17
Hutt Valley	1,096	Capital & Coast	5
		Hutt Valley	1,091
Capital & Coast	1,858	Canterbury	1
		Capital & Coast	1,823
		Hutt Valley	20
		Lakes	1
		Mid Central	1
		Nelson Marlborough	5
		Taranaki	2
		Wairarapa	5
Wairarapa	194	Wairarapa	194
Nelson Marlborough	800	Capital & Coast	1
		Counties Manukau	1
		Nelson Marlborough	795
		West Coast	3
West Coast	127	West Coast	127
Canterbury	3,067	Bay of Plenty	2
		Canterbury	3,059
		Mid Central	1
		South Canterbury	2
		West Coast	3
South Canterbury	314	Canterbury	2
		South Canterbury	312
Southern	666	Nelson Marlborough	1
		Southern	665
TOTAL			23,889

The live births denominator from Statistics New Zealand is only available by DHB at this time, so consents for screening cannot be compared with a denominator for ethnicity, deprivation status or birth location for this report. However, the proportion of consents for screening can be reported by these factors, as shown in Figures 3-5 below.

Figure 3 shows that more than half of the babies with consent for screening were in the “European” ethnic group. In this period 26% were prioritised as Maori with 11% each for Pacific and Asian ethnicities.

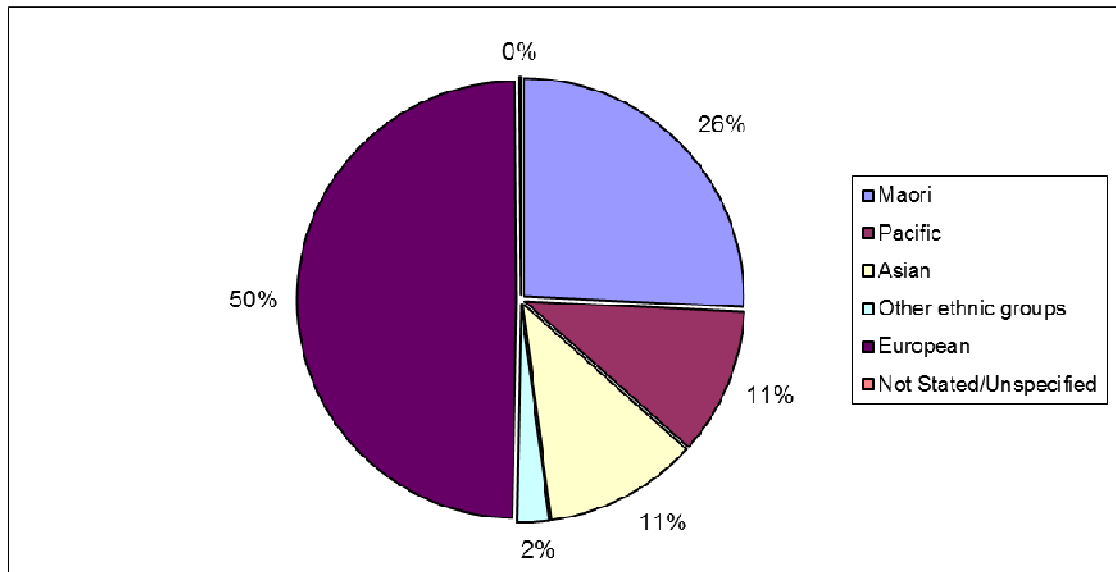


Figure 3 Consents for screening (total n=23,889) by prioritised ethnicity, April to September 2010

Figure 4 shows that just over half (54%) of the babies that consented for screening were in Decile 7 or greater (the more disadvantaged areas). Rather than this being a specific outcome related to hearing screening this is consistent with the national live births data, where a greater proportion of births occur in the more disadvantaged areas.

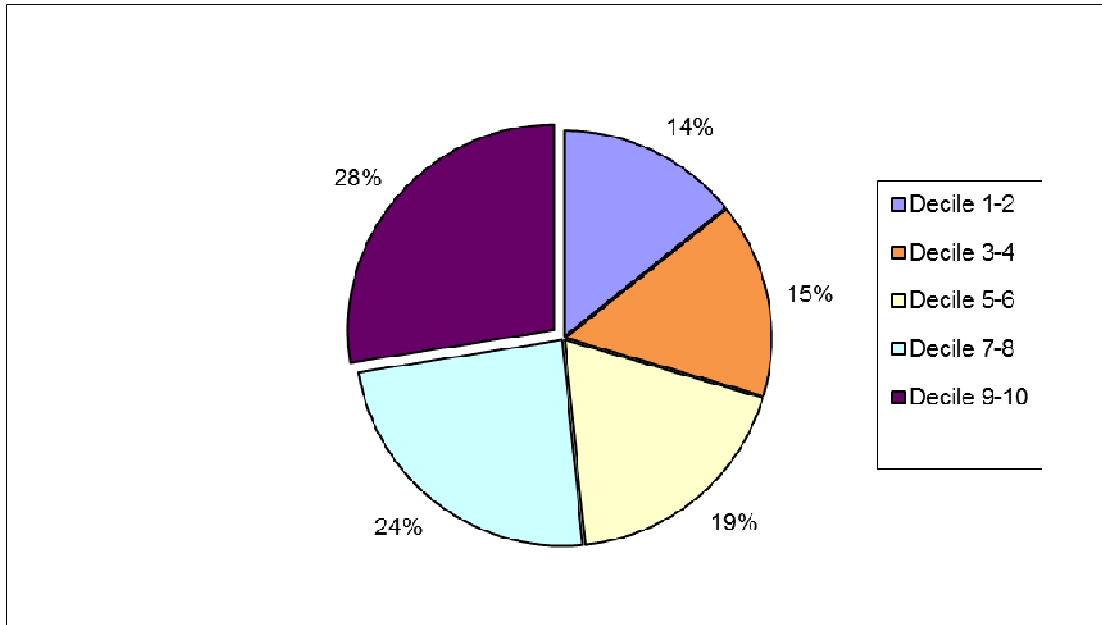


Figure 4 Consents for screening (total n=23,889) by deprivation, April to September 2010

The majority of births occur in public hospitals (98%) as seen in Figure 5. This result may reflect the implementation approach of starting newborn hearing screening in hospitals, and then rolling out screening to private and community settings. However, the birth patterns in New Zealand are strongly based in public hospitals, so this is likely to remain as the most frequent birth location.

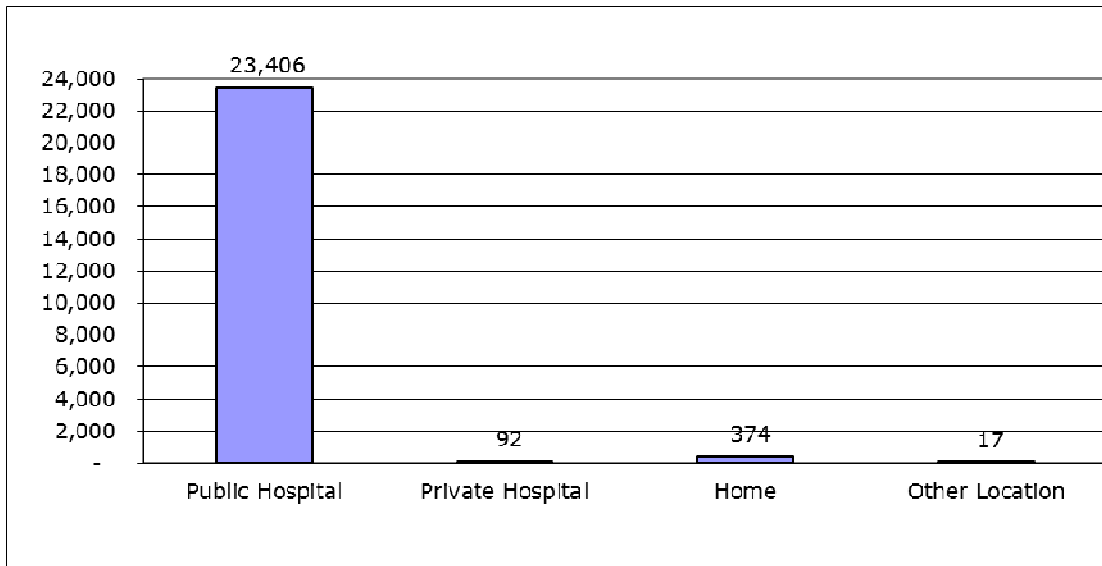


Figure 5 Consents for screening (total n=23,889) by birth location, April to September 2010

RECOMMENDATIONS ON CONSENTS FOR SCREENING

3. The National Screening Unit to follow-up with Northland DHB about their consent for screening figure.

1.2 Newborn hearing screen declined
<p>Description</p> <p>The proportion of newborns whose parents / guardian decline screening.</p>
<p>Relevant outcome</p> <p>The proportion of newborns whose parents / guardian decline screening is expected to be very low and in keeping with international programmes.</p> <p>No percentage outcome target at this stage of the programme (see rationale section).</p>
<p>Rationale</p> <p>Parents / guardians have the same right to accept or decline hearing screening or any follow-up care for their newborn as for any other screening or evaluation procedures or intervention.</p> <p>A high decline rate (eg, for an individual DHB, for the programme relative to international figures or for particular ethnic groups) would warrant further investigation and consideration of outcome targets.</p>
<p>methodology</p> <p><i>Indicator 1.2</i></p> <p>Numerator: Number of eligible newborns whose parents/guardian declined newborn hearing screening.</p> <p>Denominator: Number of eligible newborns whose parents/guardian were offered screening.</p>
<p>Notes</p> <p>There are some limitations to the decline data that will be available, due to privacy concerns. For this reason, only babies with informed consent are included in the database. The UNHSEIP receives data on the number of declines through DHB contractual reporting.</p>

4.3. Newborn Hearing Screening Declined

At this time, the decline of newborn hearing screening is reported through DHB contractual reporting to the Ministry. This is because only babies with informed consent for screening can be recorded on the national database – families who decline, and those who are not offered screening, are not recorded in the national database. In the future, if a coordinated electronic system for maternity and newborn notes is in place, the decline of screening will be able to be nationally recorded.

Table 7 is sourced from DHB quarterly reports, not from the national database extract. It is still important to report on the decline of screening, as this will enable the monitoring of trends over time. Across all the DHBs, the overall decline rate was just under 2% of those offered screening. When looking at individual DHB information, it is important to take into account that when an area has a small number of live births, the percentage of declines may look disproportionate. The decline rates were highest in Southern and Northland at around 6 percent. Southern began reporting during this time and this rate could be related to that, the higher rate in Northland is less clear and may need to be explored.

Table 7 Decline of Screening by DHB for April to September 2010

DHB	Declined Screening	Offered Screening	Percentage Declined
Northland	56	961	5.8
Waitemata	33	1731	1.9
Auckland	88	3421	2.6
Counties Manukau	31	2737	1.1
Waikato	18	2788	0.6
Lakes	12	874	1.4
Bay of Plenty	24	1489	1.6
Tairāwhiti	1	384	0.3
Taranaki	16	833	1.9
Hawkes Bay	4	1064	0.4
Whanganui	4	463	0.9
Midcentral	3	616	0.5
Hutt	7	1133	0.6
Capital & Coast	31	1927	1.6
Wairarapa	6	225	2.7
Nelson Marlborough	29	898	3.2
West Coast	3	167	1.8
Canterbury	52	3153	1.6
South Canterbury	10	324	3.1
Southern	50	796	6.3
Total	478	25984	1.8

RECOMMENDATIONS ON DECLINE OF SCREENING

4. The National Screening Unit to follow-up with Northland and Southern DHBs about their decline of screening figure, including breakdown by ethnicity.

1.3 Newborn hearing screening started	
Description	The proportion of the eligible newborns whose parents / guardian consented to newborn hearing screening that start screening.
Relevant outcome	All eligible newborns (whose parents / guardian consent to newborn hearing screening) start screening.
RATIONALE	
<p>For ongoing service and programme development it is important to compare consent for screening numbers, with screening started coverage and screening completed coverage, particularly from an inequalities perspective.</p> <p>International programmes generally have a >95% screen completed target for all eligible births. As many of these programmes are achieving their targets after initial implementation (see screen completed indicator), a high screen started figure should be achievable once the UNHSEIP is fully implemented.</p> <p>At this stage of programme implementation, a specific outcome target has not been set. However, if regular reviews of data for this indicator reveal issues with progression through the screening pathway from consent to screening started to screening completed, particularly from an inequalities perspective, then further investigation, working with DHBs and consideration of outcome targets would be necessary.</p>	
Methodology	
<i>Indicator 1.3</i>	
Numerator:	Number of eligible newborns that started newborn hearing screening.
Denominator:	Number of eligible newborns born whose parents / guardian consented to newborn hearing screening.

4.4. Newborn Hearing Screening Started

Monitoring the proportion of babies who actually start screening when their family and whānau has consented is important to identify potential gaps in systems and processes. For example if a high proportion of babies with consent are not starting screening due to early discharge, then solutions such as more outpatient clinics may need to be considered. Started screening is when there is a valid date for screening test 1, and there is a valid screening outcome for at least one ear. For records to be included in each of the following indicators they must have started screening.

Factors such as whether the baby is admitted to NICU/SCBU, ethnicity, deprivation status and birth location could influence participation in newborn hearing screening. The information presented in Tables 9-11 indicates that none of these factors are significant at this time.

Overall, 99.5% of babies with consent for screening do start screening, and this high proportion is consistent across DHBs, as show in Figure 6.

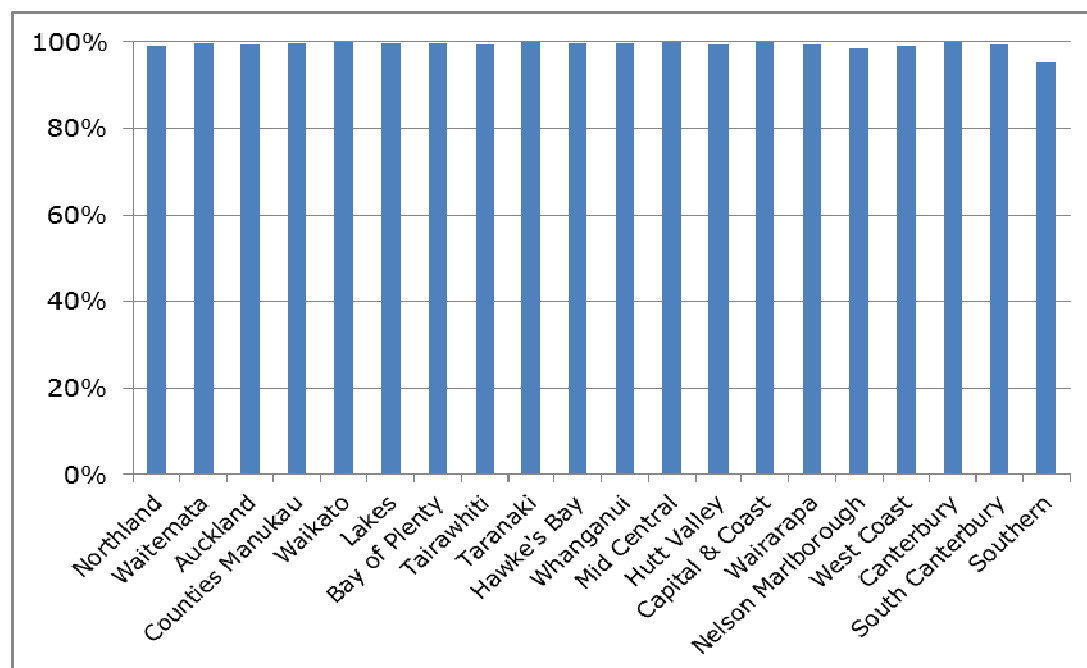


Figure 6 Proportion of babies with consent who start newborn hearing screening, April to September 2010

RECOMMENDATIONS ON NEWBORN HEARING SCREENING STARTED

5. DHBs are to be congratulated on their achievements regarding the high proportion of screening started compared with consent to screening.

Table 8 Newborn Hearing Screening Started compared with Consents to Screening by DHB, April to September 2010

DHB	Well Baby			NICU/SCBU			Total		
	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started
Northland	487	483	99.2%	50	49	98.0%	537	532	99.1%
Waitemata	1797	1,793	99.8%	89	89	100.0%	1886	1,882	99.8%
Auckland	2875	2,862	99.5%	205	201	98.0%	3080	3,063	99.4%
Counties Manukau	1938	1,934	99.8%	149	148	99.3%	2087	2,082	99.8%
Waikato	2471	2,467	99.8%	231	231	100.0%	2702	2,698	99.9%
Lakes	745	742	99.6%	64	64	100.0%	809	806	99.6%
Bay of Plenty	1279	1,273	99.5%	101	101	100.0%	1380	1,374	99.6%
Tairāwhiti	322	320	99.4%	37	37	100.0%	359	357	99.4%
Taranaki	698	697	99.9%	68	68	100.0%	766	765	99.9%
Hawke's Bay	1021	1,017	99.6%	101	101	100.0%	1122	1,118	99.6%
Whanganui	378	377	99.7%	29	29	100.0%	407	406	99.8%
Mid Central	537	537	100.0%	95	95	100.0%	632	632	100.0%
Hutt Valley	964	957	99.3%	132	131	99.2%	1096	1,088	99.3%
Capital & Coast	1679	1,679	100.0%	179	178	99.4%	1858	1,857	99.9%
Wairarapa	179	178	99.4%	15	15	100.0%	194	193	99.5%
Nelson Marlborough	752	745	99.1%	48	44	91.7%	800	789	98.6%
West Coast	126	125	99.2%	1	1	100.0%	127	126	99.2%
Canterbury	2840	2,837	99.9%	227	227	100.0%	3067	3,064	99.9%
South Canterbury	300	298	99.3%	14	14	100.0%	314	312	99.4%
Southern	609	580	95.2%	57	55	96.5%	666	635	95.3%
Total	21,997	21,901	99.6%	1,892	1,878	99.3%	23,889	23,779	99.5%

Table 9 Newborn Hearing Screening Started compared with Consents to Screening by Ethnicity, April to September 2010

Ethnicity	Well Baby			NICU/SCBU			Total		
	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started
Maori	5,580	5,554	99.5%	569	566	99.5%	6,149	6,120	99.5%
Pacific	2,413	2,401	99.5%	184	183	99.5%	2,597	2,584	99.5%
Asian	2,541	2,532	99.6%	167	166	99.4%	2,708	2,698	99.6%
European	10,913	10,867	99.6%	932	923	99.0%	11,845	11,790	99.5%
Not Stated/Unspecified	28	28	100.0%	2	2	100.0%	30	30	100.0%
Other ethnic groups	522	519	99.4%	38	38	100.0%	560	557	99.5%
Total	21,997	21,901	99.6%	1,892	1,878	99.3%	23,889	23,779	99.5%

Table 10 Newborn Hearing Screening Started compared with Consents to Screening by Deprivation, April to September 2010

Decile	Well Baby			NICU/SCBU			Total		
	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started
Decile 1-2	3,157	3,147	99.7%	242	238	98.3%	3,399	3,385	99.6%
Decile 3-4	3,392	3,378	99.6%	265	263	99.2%	3,657	3,641	99.6%
Decile 5-6	4,160	4,144	99.6%	348	345	99.1%	4,508	4,489	99.6%
Decile 7-8	5,254	5,227	99.5%	488	486	99.6%	5,742	5,713	99.5%
Decile 9-10	6,022	5,993	99.5%	548	545	99.5%	6,570	6,538	99.5%
Unknown	12	12	100.0%	1	1	100.0%	13	13	100.0%
Total	21,997	21,901	99.6%	1,892	1,878	99.3%	23,889	23,779	99.5%

Table 11 Newborn Hearing Screening Started compared to Consents to Screening by Birth Location, April to September 2010

Birth Location	Well Baby			NICU/SCBU			Total		
	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started	Consented to screening	Started Screening	% of consents that started
Public Hospital	21535	21442	99.6%	1871	1857	99.3%	23406	23299	99.5%
Private Hospital	91	90	98.9%	1	1	100.0%	92	91	98.9%
Home	356	354	99.4%	18	18	100.0%	374	372	99.5%
Other location	15	15	100.0%	2	2	100.0%	17	17	100.0%
Total	21997	21901	99.6%	1892	1878	99.3%	23889	23779	99.5%

1.4 Newborn hearing screening completed

Description

1. The proportion of eligible newborns that complete the UNHS screening protocol.
2. The proportion of eligible newborns who complete the UNHS screening protocol by 1 month of age.

Relevant Outcome

A core goal of the programme is that eligible newborns, whose parents/guardians consented, should complete newborn screening by 1 month of age.

Rationale

“Newborns to be screened by 1 month of age” is a core goal of the UNHSEIP ie: the 1 part of the 1-3-6 goals.

Although the international targets are usually >95% of all newborns screened by 1 month of age, many are achieving above this:

- >95% coverage should be obtainable where screening occurs in a hospital environment
- >95% for community screening may depend on factors such as the timeliness of notification of birth, but should be achievable in the longer-term.

This indicator will be closely monitored and further investigation will be required if progression towards the goal is not occurring.

Methodology

Indicator 1.4a

Numerator: Number of eligible newborns that complete newborn hearing screening.

Denominator: Number of eligible newborns who began newborn hearing screening.

Indicator 1.4b

Numerator: Number of eligible newborns that complete newborn hearing screening by 1 month of age.

Denominator: Number of eligible newborns who complete newborn hearing screening.

4.5. Newborn Hearing Screening Completed

Monitoring the proportion of babies who complete screening when it has been started is important in identifying potential gaps in systems and processes. For example, if a high proportion of babies start screening but do not complete the process, protocols for following-up families and offering outpatient appointments may need to be strengthened, or transfer between DHBs may be an issue. One of the core goals of the programme is for newborn hearing screening to be completed by the time the baby is one month of age (4 weeks corrected age).

Overall, 99.1% of babies who started screening completed, and 94% of those babies who had completed screening did so by the time they were one month of age. The high proportion of completion overall is consistent across DHBs, as shown in Figure 7. There is much more variation in the data for completion by one month with the lowest rates being seen in Northland (66%) which joined the screening programme at the beginning of this reporting period.

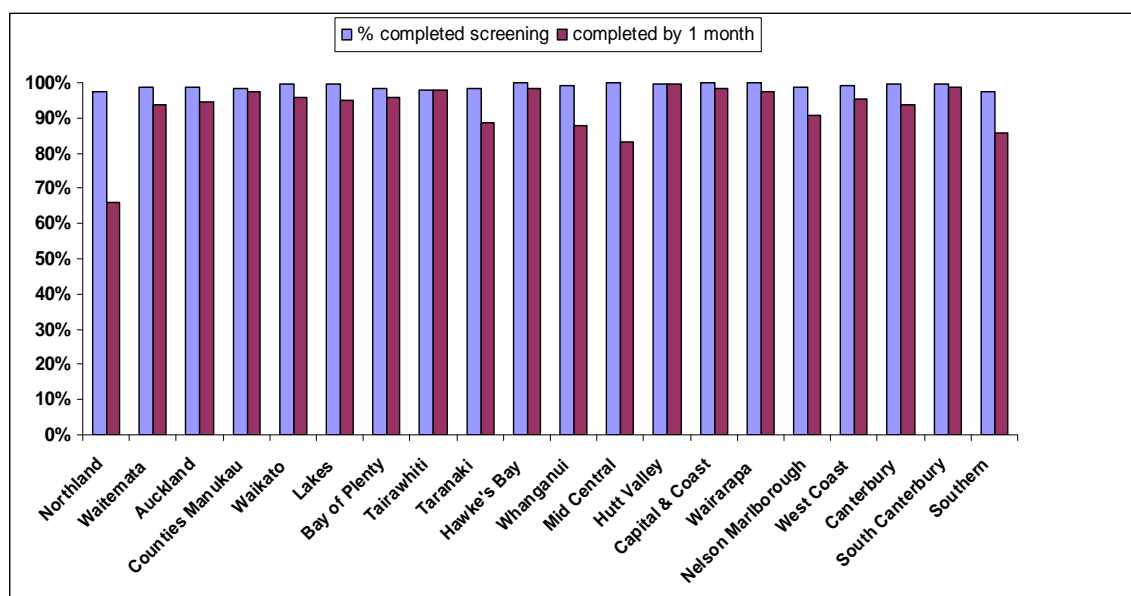


Figure 7 Proportion of babies who complete screening after starting, and the proportion of those who completed screening by the time they were one month of age, April to September 2010

This information can be seen in greater detail in Tables 12 and 13. It is interesting to note the 100% of screening started in NICU/SCBU was completed.

Figure 8 shows the spread of screening times for all those who completed screening. There are 23 babies not shown on the graph who had completion times greater than 17 weeks. All but one were completed by 35 weeks with one baby completing screening at 57 weeks.

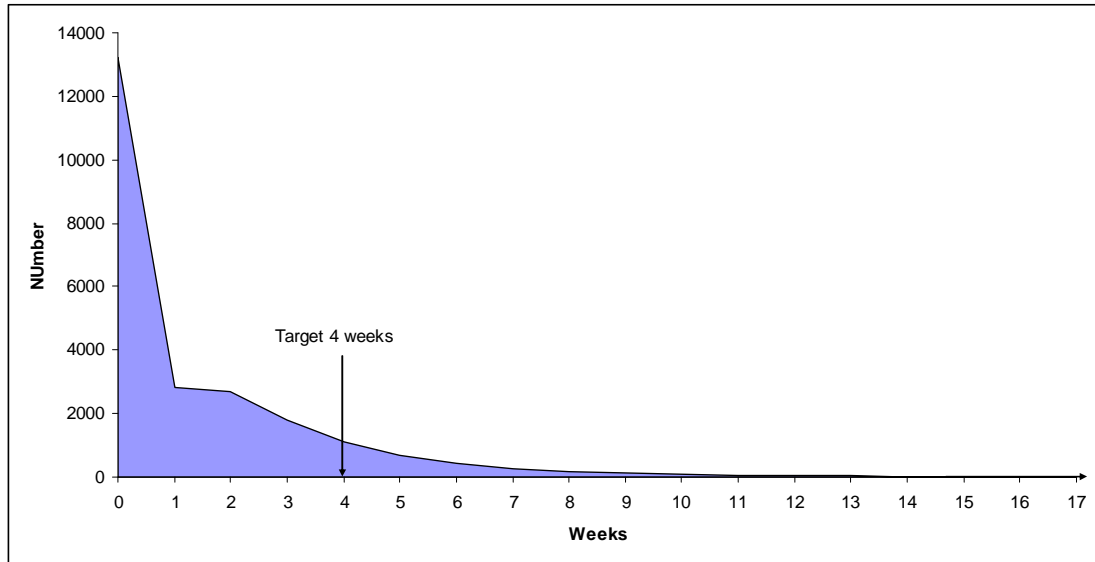


Figure 8 Spread of screening completion times in weeks, April to September 2010

Table 12 Newborn Hearing Screening Completed compared with Started by DHB, April to September 2010

DHB	Well Baby			NICU/SCBU			Total		
	Started Screening	Completed Screening	% Started that completed	Started Screening	Completed Screening	% Started that completed	Started Screening	Completed Screening	% Started that completed
Northland	483	469	97.1%	49	49	100.0%	532	518	97.4%
Waitemata	1,793	1,772	98.8%	89	89	100.0%	1,882	1,861	98.9%
Auckland	2,862	2,824	98.7%	201	201	100.0%	3,063	3,025	98.8%
Counties Manukau	1,934	1,897	98.1%	148	148	100.0%	2,082	2,045	98.2%
Waikato	2,467	2,460	99.7%	231	231	100.0%	2,698	2,691	99.7%
Lakes	742	740	99.7%	64	63	98.4%	806	803	99.6%
Bay of Plenty	1,273	1,251	98.3%	101	101	100.0%	1,374	1,352	98.4%
Tairāwhiti	320	313	97.8%	37	37	100.0%	357	350	98.0%
Taranaki	697	685	98.3%	68	68	100.0%	765	753	98.4%
Hawke's Bay	1,017	1,016	99.9%	101	101	100.0%	1,118	1,117	99.9%
Whanganui	377	374	99.2%	29	29	100.0%	406	403	99.3%
Mid Central	537	537	100.0%	95	95	100.0%	632	632	100.0%
Hutt Valley	957	953	99.6%	131	131	100.0%	1,088	1,084	99.6%
Capital & Coast	1,679	1,678	99.9%	178	178	100.0%	1,857	1,856	99.9%
Wairarapa	178	178	100.0%	15	15	100.0%	193	193	100.0%
Nelson Marlborough	745	735	98.7%	44	44	100.0%	789	779	98.7%
West Coast	125	124	99.2%	1	1	100.0%	126	125	99.2%
Canterbury	2,837	2,818	99.3%	227	227	100.0%	3,064	3,045	99.4%
South Canterbury	298	297	99.7%	14	14	100.0%	312	311	99.7%
Southern	580	563	97.1%	55	55	100.0%	635	618	97.3%
Total	21,901	21,684	99.0%	1,878	1,877	99.9%	23,779	23,561	99.1%

Table 13 Newborn Hearing Screening Completed by one month of age by DHB, April to September 2010

DHB	Well Baby			NICU/SCBU			Total		
	Completed Screening	Completed Screening by 1 month of age	% Completed that completed by 1 month of age	Completed Screening	Completed Screening by 1 month of age	% Completed that completed by 1 month of age	Completed Screening	Completed Screening by 1 month of age	% Completed that completed by 1 month of age
Northland	469	312	66.5%	49	30	61.2%	518	342	66.0%
Waitemata	1,772	1,661	93.7%	89	79	88.8%	1,861	1,740	93.5%
Auckland	2,824	2,673	94.7%	201	183	91.0%	3,025	2,856	94.4%
Counties Manukau	1,897	1,850	97.5%	148	146	98.6%	2,045	1,996	97.6%
Waikato	2,460	2,349	95.5%	231	225	97.4%	2,691	2,574	95.7%
Lakes	740	702	94.9%	63	62	98.4%	803	764	95.1%
Bay of Plenty	1,251	1,199	95.8%	101	98	97.0%	1,352	1,297	95.9%
Tairāwhiti	313	306	97.8%	37	36	97.3%	350	342	97.7%
Taranaki	685	601	87.7%	68	65	95.6%	753	666	88.4%
Hawke's Bay	1,016	997	98.1%	101	100	99.0%	1,117	1,097	98.2%
Whanganui	374	326	87.2%	29	28	96.6%	403	354	87.8%
Mid Central	537	436	81.2%	95	89	93.7%	632	525	83.1%
Hutt Valley	953	948	99.5%	131	131	100.0%	1,084	1,079	99.5%
Capital & Coast	1,678	1,653	98.5%	178	174	97.8%	1,856	1,827	98.4%
Wairarapa	178	174	97.8%	15	14	93.3%	193	188	97.4%
Nelson Marlborough	735	666	90.6%	44	42	95.5%	779	708	90.9%
West Coast	124	118	95.2%	1	1	100.0%	125	119	95.2%
Canterbury	2,818	2,622	93.0%	227	225	99.1%	3,045	2,847	93.5%
South Canterbury	297	293	98.7%	14	14	100.0%	311	307	98.7%
Southern	563	479	85.1%	55	52	94.5%	618	531	85.9%
Total	21,684	20,365	93.9%	1,877	1,794	95.6%	23,561	22,159	94.0%

Factors such as ethnicity, deprivation status and birth location may influence completion rates, and/or the time taken for the completion for newborn hearing screening. The information presented in Tables 14-16 show little difference at the moment with the exception of the proportion of those babies who were born at home who have completed screening they are less likely to have completed within a month.

Table 14 Newborn Hearing Screening Completed by Ethnicity, April to September 2010

Ethnicity	Started screening	Completed screening	Completed screening by 1 month of age	% started that completed screening	% completed that completed by 1 month of age
Maori	6,120	6,039	5,606	98.7%	92.8%
Pacific	2,584	2,543	2,429	98.4%	95.5%
Asian	2,698	2,685	2,582	99.5%	96.2%
European	11,790	11,711	10,983	99.3%	93.8%
Not stated/Unspecified	30	30	30	100.0%	100.0%
Other ethnic groups	557	553	529	99.3%	95.7%
Total	23,779	23,561	22,159	99.1%	94.0%

Table 15 Newborn Hearing Screening Completed by Deprivation, April to September 2010

Decile	Started screening	Completed screening	Completed screening by 1 month of age	% started that completed screening	% completed that completed by 1 month of age
Decile 1-2	3,385	3,362	3,201	99.3%	95.2%
Decile 3-4	3,641	3,611	3,385	99.2%	93.7%
Decile 5-6	4,489	4,454	4,186	99.2%	94.0%
Decile 7-8	5,713	5,664	5,292	99.1%	93.4%
Decile 9-10	6,538	6,457	6,082	98.8%	94.2%
Unknown	13	13	13	100.0%	100.0%
Total	23,779	23,561	22,159	99.1%	94.0%

Table 16 Newborn Hearing Screening Completed by Birth Location, April to September 2010

Birth Location	Started screening	Completed screening	Completed screening by 1 month of age	% started that completed screening	% completed that completed by 1 month of age
Public Hospital	23,299	23,087	21,786	99.1%	94.4%
Private Hospital	91	91	87	100.0%	95.6%
Home	372	366	271	98.4%	74.0%
Other Location	17	17	15	100.0%	88.2%
Total	23,779	23,561	22,159	99.1%	94.0%

RECOMMENDATIONS ON NEWBORN HEARING SCREENING COMPLETED

6. The National Screening Unit is to follow-up with Northland, Taranaki, Whanganui, MidCentral and Southern DHBs about their newborn hearing screening completed by one month of age figures.

1.5 Referral rate to audiology assessment	
Description	The proportion of newborns that do not pass the hearing screening process and are referred for audiology assessment.
Relevant Outcome	Less than 4% of eligible newborns screened in the UNHSEIP will be referred for audiology assessment.
Rationale	<p>An unnecessarily high number of newborns being referred to audiology assessment could lead to potential strain on audiological capacity and parental anxiety issues. Conversely, if the referral rate is too low, newborns with a hearing loss may be being missed. High or low referral rates may indicate that further training of screeners or investigation is needed.</p> <p>Internationally, the referral targets for audiology assessment are generally 4% or less. In keeping with international experience, it is anticipated that referral rates will be higher in the initial stages of implementation and decrease as the programme becomes established.</p> <p>Subsequent reviews of the data and Monitoring Framework will revisit this indicator with respect to improving referral rates and consideration of outcome targets for DHBs.</p>
Methodology	<p>Indicator 1.5</p> <p>Numerator: Number of eligible newborns who complete screening with a referral to audiology assessment (ie do not pass screen).</p> <p>Denominator: The number of eligible newborns who complete screening.</p>

4.6. Referral to Audiology

The maximum referral rate for audiology assessment from newborn hearing screening has been set at 4%, based on international literature. This is generally thought to be quite a high level, and rates of 1-2% are commonly reported by international screening programmes. The average rate of referral to audiology in this period was 2.4 percent as detailed in Table 16 below.

The higher rates for Northland, Auckland and Counties Manukau are of note but as it is still early days of implementation for these DHB's the figures will need to be monitored over a longer period.

The rates in the remaining DHBs range from 2.8% in Southern to none on the West Coast. It is not possible to make any valid comments due to the small difference in percentages and small actual number of referrals in many DHBs.

Admission to NICU/SCBU (for 48 hours or more) resulted in a higher proportion of referrals to audiology, at an average of 8.6% as show in Table 17. More detail on referrals to audiology by ethnicity, deprivation status and birth location are presented in Tables 18-20. The information indicates that none of these factors have an impact at this time, with the possible exception of higher referral rates for Pacific babies – this will need to be monitored over time to see if this is a consistent trend as the differences are quite small.

Table 17 Referral to Audiology by DHB and NICU/SCBU admission, April to September 2010

DHB of Birth	Well Baby			NICU/SCBU			Total		
	Number completed screening	Number referred to audiology	% completed screening that were referred	Number completed screening	Number referred to audiology	% completed screening that were referred	Number completed screening	Number referred to audiology	% completed screening that were referred
Northland	469	20	4.3%	49	4	8.2%	518	24	4.6%
Waitemata	1,772	19	1.1%	89	4	4.5%	1,861	23	1.2%
Auckland	2,824	94	3.3%	201	40	19.9%	3,025	134	4.4%
Counties Manukau	1,897	100	5.3%	148	29	19.6%	2,045	129	6.3%
Waikato	2,460	29	1.2%	231	18	7.8%	2,691	47	1.7%
Lakes	740	13	1.8%	63	2	3.2%	803	15	1.9%
Bay of Plenty	1,251	9	0.7%	101	3	3.0%	1,352	12	0.9%
Tairāwhiti	313	2	0.6%	37	1	2.7%	350	3	0.9%
Taranaki	685	10	1.5%	68	7	10.3%	753	17	2.3%
Hawke's Bay	1,016	10	1.0%	101	11	10.9%	1,117	21	1.9%
Whanganui	374	6	1.6%	29	3	10.3%	403	9	2.2%
Mid Central	537	7	1.3%	95	7	7.4%	632	14	2.2%
Hutt Valley	953	5	0.5%	131	7	5.3%	1,084	12	1.1%
Capital & Coast	1,678	5	0.3%	178	4	2.2%	1,856	9	0.5%
Wairarapa	178	0	0.0%	15	1	6.7%	193	1	0.5%
Nelson Marlborough	735	6	0.8%	44	2	4.5%	779	8	1.0%
West Coast	124	0	0.0%	1	0	0.0%	125	0	0.0%
Canterbury	2,818	47	1.7%	227	17	7.5%	3,045	64	2.1%
South Canterbury	297	4	1.3%	14	0	0.0%	311	4	1.3%
Southern	563	15	2.7%	55	2	3.6%	618	17	2.8%
Total	21,684	401	1.8%	1,877	162	8.6%	23,561	563	2.4%

Table 18 Referral to Audiology by Ethnicity, April to September 2010

Ethnicity	Number completed screening	Number referred to audiology	% completed screening that were referred
Maori	6,039	167	2.8%
Pacific	2,543	111	4.4%
Asian	2,685	72	2.7%
European	11,711	197	1.7%
Not stated/Unspecified	30	0	0.0%
Other ethnic groups	553	16	2.9%
Total	23,561	563	2.4%

Table 19 Referral to Audiology by Deprivation, April to September 2010

Decile	Number completed screening	Number referred to audiology	% completed screening that were referred
Decile 1-2	3,362	58	1.7%
Decile 3-4	3,611	70	1.9%
Decile 5-6	4,454	86	1.9%
Decile 7-8	5,664	137	2.4%
Decile 9-10	6,457	212	3.3%
Unknown	13	0	0.0%
Total	23,561	563	2.4%

Table 20 Referral to Audiology by Birth Location, April to September 2010

Birth Location	Number completed screening	Number referred to audiology	% completed screening that were referred
Public Hospital	23,087	552	2.4%
Private Hospital	91	1	1.1%
Home	366	10	2.7%
Other Location	17	0	0.0%
Total	23,561	563	2.4%

RECOMMENDATIONS ON REFERRAL TO AUDIOLOGY

7. The National Screening Unit is to list the DHBs by their NICU service level in the next monitoring report.

1.11 Newborns at-risk of delayed-onset or progressive hearing loss	
Description	The proportion of newborns that pass screening, but have risk factors for developing late-onset or progressive hearing loss.
Relevant Outcome	Eligible newborns that passed newborn screening with risk factors for developing late-onset or progressive hearing loss should be followed up as per UNHSEIP recommendations. Although this subset of children do not form part of the primary target group for the UNHSEIP, it is important to monitor the number being referred to audiology assessment services.
Rationale	<p>There are a number of risk factors for developing late-onset or progressive hearing loss eg, family history of permanent childhood hearing loss; in-utero infections such as Cytomegalovirus (CMV) and Rubella; and certain syndromes (Joint Committee on Infant Hearing, 2007).</p> <p>Children who pass newborn hearing screening but who have certain risk factors require follow-up to detect any subsequent development of hearing loss. International programmes generally monitor follow-up of these children.</p>
Methodology	<p>Indicator 1.11</p> <p>Numerator: Number of eligible newborns who passed screening, but have risk factors for developing late-onset or progressive hearing loss.</p> <p>Denominator: Number of eligible newborns who passed screening (as part of the UNHSEIP).</p>

4.7. Targeted Follow-up

An average of 7.4% of babies who passed screening were flagged for targeted follow-up due to the presence of one or more risk factors for delayed onset/progressive hearing loss. This indicator is calculated based on the screening outcome recorded as “Pass Targeted follow-up required” on the Newborn Hearing Screening data from.

Table 21 below indicates that the proportion of babies flagged for targeted follow-up varies between DHBs. The highest percentage of follow-up is seen in Northland (15%) and Hutt Valley (14%). Discussion with Hutt Valley DHB around clarification of risk factor interpretation mean this proportion will drop in future reports. As would be expected, admission to NICU/SCBU (for 48 hours or more) resulted in a higher proportion of babies for targeted follow-up.

More detail on targeted follow-up by ethnicity, deprivation status and birth location are presented in Tables 22-24. The information indicates that these factors do not seem to be influencing targeted follow-up rates at this time. The proportion of targeted follow up appears to be slightly higher for Maori babies and slightly lower for Asian babies, however monitoring trends to see if these are valid over time will be important.

Within this reporting period, from August 2010, some minor changes were made to the risk factors, which may have had a flow on effect on the proportion of babies requiring targeted follow-up. This current data will be compared to the data in the next report to monitoring any differences.

Table 21 Proportion of Targeted Follow-up by DHB and NICU/SCBU, April to September 2010

DHB of birth	Well Baby			NICU/SCBU			Total		
	Passed screening	Passed Targeted Follow-up Required	Targeted Follow-up Proportion	Passed screening	Passed Targeted Follow-up Required	Targeted Follow-up Proportion	Passed screening	Passed Targeted Follow-up Required	Targeted Follow-up Proportion
Northland	449	41	9.1%	45	31	68.9%	494	72	14.6%
Waitemata	1,753	69	3.9%	85	46	54.1%	1,838	115	6.3%
Auckland	2,730	72	2.6%	161	64	39.8%	2,891	136	4.7%
Counties Manukau	1,797	92	5.1%	119	75	63.0%	1,916	167	8.7%
Waikato	2,431	114	4.7%	213	73	34.3%	2,644	187	7.1%
Lakes	727	28	3.9%	61	26	42.6%	788	54	6.9%
Bay of Plenty	1,242	43	3.5%	98	30	30.6%	1,340	73	5.4%
Tairāwhiti	311	13	4.2%	36	9	25.0%	347	22	6.3%
Taranaki	675	49	7.3%	61	33	54.1%	736	82	11.1%
Hawke's Bay	1,006	76	7.6%	90	20	22.2%	1,096	96	8.8%
Whanganui	368	21	5.7%	26	17	65.4%	394	38	9.6%
Mid Central	530	39	7.4%	88	37	42.0%	618	76	12.3%
Hutt Valley	948	81	8.5%	124	67	54.0%	1,072	148	13.8%
Capital & Coast	1,673	59	3.5%	174	84	48.3%	1,847	143	7.7%
Wairarapa	178	7	3.9%	14	7	50.0%	192	14	7.3%
Nelson Marlborough	729	55	7.5%	42	11	26.2%	771	66	8.6%
West Coast	124	12	9.7%	1	1	100.0%	125	13	10.4%
Canterbury	2,771	103	3.7%	210	27	12.9%	2,981	130	4.4%
South Canterbury	293	3	1.0%	14	11	78.6%	307	14	4.6%
Southern	548	24	4.4%	53	26	49.1%	601	50	8.3%
Total	21,283	1,001	4.7%	1,715	695	40.5%	22,998	1,696	7.4%

Table 22 Proportion of Targeted Follow-up by Ethnicity, April to September 2010

Ethnicity	Passed screening	Passed - Targeted Follow-up Required	Targeted Follow-up Proportion
Maori	5872	540	9.2%
Pacific	2432	160	6.6%
Asian	2613	115	4.4%
European	11514	845	7.3%
Not stated/Unspecified	30	2	6.7%
Other ethnic groups	537	34	6.3%
Total	22,998	1696	7.4%

Table 23 Proportion of Targeted Follow-up by Deprivation, April to September 2010

Decile	Passed screening	Passed - Targeted Follow-up Required	Targeted Follow-up Proportion
Decile 1-2	3304	235	7.1%
Decile 3-4	3541	222	6.3%
Decile 5-6	4368	288	6.6%
Decile 7-8	5527	438	7.9%
Decile 9-10	6245	513	8.2%
Unknown	13	0	0.0%
Total	22,998	1696	7.4%

Table 24 Proportion of Targeted Follow-up by Birth Location, April to September 2010

Birth Location	Passed screening	Passed - Targeted Follow-up Required	Targeted Follow-up Proportion
Public Hospital	22,535	1,661	7.4%
Private Hospital	90	3	3.3%
Home	356	29	8.1%
Other Location	17	3	17.6%
Total	22,998	1,696	7.4%

RECOMMENDATIONS ON TARGETED FOLLOW-UP

8. The National Screening Unit to follow-up with Northland, Taranaki, MidCentral, Hutt Valley and West Coast about their proportion of targeted follow-up.

4.8. Risk Factors

From April to September 2,753 (12%) of babies that completed screening had at least one risk factor recorded. As can be seen in the tables above 1,696 (7.4%) of all babies had a screening outcome of “Pass Targeted follow-up required”.

As noted previously, some of this difference is explained because the risk factor of “jaundice phototherapy” does not require targeted follow-up, but this does not account for the complete difference. It is understood that in some areas clinicians are involved in assessing screening information, and making recommendations on whether targeted follow-up was necessary. This process seems to have had an impact and ongoing monitoring of this difference will be needed.

The most frequently reported risk factor was “Family History” followed by “Other” during this reporting period. Each of these accounted for around a quarter of risk factors recorded for those babies who had a risk factor and was a risk factor for around 3% (for each of these) for all babies who started screening.

There was an expectation that “Family History” may increase as a proportion given the decision to include second degree relatives since August 2010 which is within this reporting period. This policy change also clarified the interpretation of ventilation and TORCHS, and the proportion of these two risk factors is expected to decrease after this time.

Table 25 Frequency of Risk Factors, April to September 2010

Risk Factor	Number of babies	Of those babies with a risk factor the proportion for each risk factor	Of those babies who started screening the proportion for each risk factor
Family History	680	25%	2.9%
Jaundice Phototherapy	581	21%	2.4%
Ventilation	496	18%	2.1%
NICU more than 5 days	430	16%	1.8%
Cranio-facial Anomalies	356	13%	1.5%
TORCH/S	306	11%	1.3%
Bacterial/Viral Meningitis	148	5%	0.6%
Head Trauma	62	2%	0.3%
Syndrome	47	2%	0.2%
Jaundice Transfusion Level	31	1%	0.1%
Other	628	23%	2.6%

Of the 2,753 babies with one or more risk factors recorded, 75% had just one risk factor, 17% had two, 5% had three, 2% had four and less than one percent had the maximum of five risk factors, as show in Figure 9.

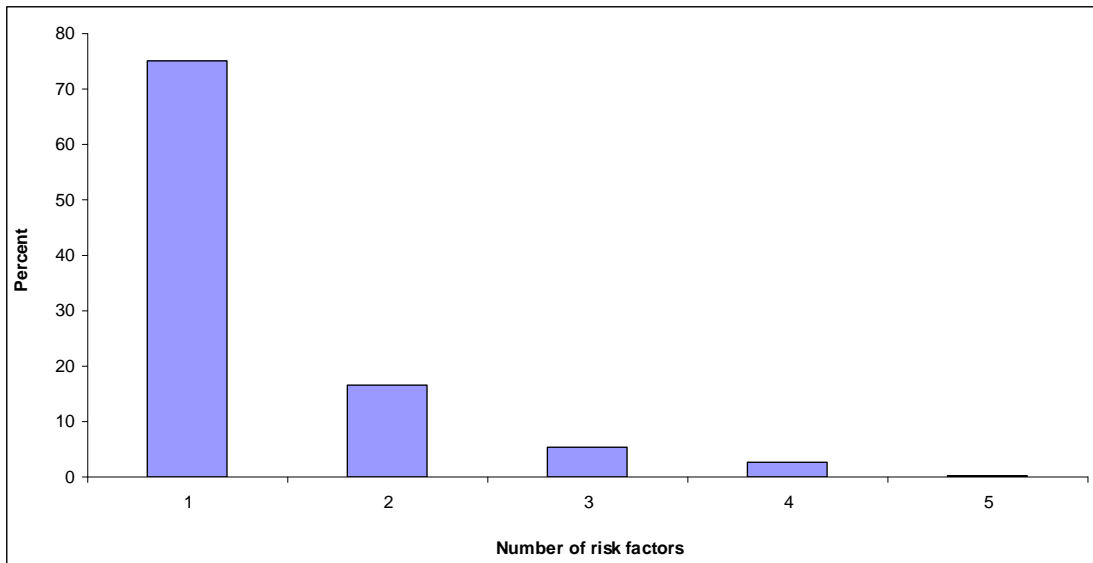


Figure 9 Of those babies with a risk factor the proportion with one or more risk factors, April to September 2010

RECOMMENDATIONS ON RISK FACTORS

There were no recommendations made by the Advisory Group.

1.6 Audiology assessment started
<p>Description</p> <p>The average time from completing screening to commencing audiology assessment.</p> <p>The proportion of eligible newborns that are referred from screening who commence audiology assessment.</p>
<p>Relevant Outcome</p> <p>“Audiology assessment is completed by 3 months of age” is a core goal of the UNHSEIP ie: the 3 part of the 1-3-6 goals. Eligible newborns that <i>do not pass</i> hearing screening should have the audiology assessment completed by 3 months of age.</p>
<p>Rationale</p> <p>The UNHSEIP has the core goals of screening completed by 1 month of age and audiology assessment completed by 3 months of age.</p> <p>This indicator will monitor the time period between the two stages. Prolonged delays, or inequalities amongst groups, in this indicator would warrant investigation.</p>
<p>Methodology</p> <p><i>Indicator 1.6a</i></p> <p>Average time (in days) from when screening was completed for newborns to when audiology assessment commences¹.</p> <p><i>Indicator 1.6b</i></p> <p>Numerator: Number of eligible newborns who start audiology assessment.</p> <p>Denominator: Number of eligible newborns who were referred from screening for audiology assessment.</p>

¹It is expected that this average time should be approximately 4 weeks.

4.9. Audiology Assessment Started

This is the first reporting of audiology indicators and as such the information presented is largely to illustrate what the Programme reporting expectations will be for the future. Only approximately 40% of the expected amount of information on audiology was recorded in the national database for this reporting period. This poor level of information capture was mostly due to DHBs not submitting forms to the National Screening Unit, and also some information was not able to be entered because it was incomplete.

Data in this section is for babies who were referred from screening to audiology (did not pass screening) and the audiology assessment was then started (n=228). As per Table 17, 563 babies did not pass screening and were referred to audiology, however audiology information was provided to the NSU and available for just 228 of these babies. This does not necessarily mean that only 40% of referred babies were seen by audiology, but it does mean that DHB audiologists must be encouraged to complete and submit the audiology forms.

For this six month period there were no audiology referrals from the West Coast, hence no data for this DHB is included in this section. While there were referrals from all but the West Coast DHB, a further four DHBs had no audiology assessment data reported (Waitemata, Hawkes Bay, Whanganui, and Wairarapa).

Table 26 below shows where babies who had an initial screening test and where their audiology test was performed. The data in the table is based on the 228 completed audiology tests. It can be seen that the majority of audiology tests occur in the same DHB as the initial screening. The greatest variation was seen for Hutt Valley where five audiology tests occurred in Counties Manukau and one in Waikato.

Table 27 below indicates that of those babies referred to audiology, the Programme had information in the national database for 40.5% of these babies. The incomplete nature of this audiology information contributes to the variable rates of audiology assessment started between the DHBs. Also in many cases the actual numbers are small and statistical comparisons are not valid or useful.

For this indicator, the DHB of birth has been used so that DHBs are able to track their referrals. For the other audiology indicators, DHB of audiology has been used, as the responsibility of completing audiology rests with the DHB carrying out the audiology assessments.

Table 26 Comparison of DHB of screening with DHB of Audiology assessment, April to September 2010

DHB of initial screening	Number of babies	DHB of Audiology Test	Number of babies
Northland	9	Northland	9
Auckland	28	Auckland	24
		Counties Manukau	4
Counties Manukau	51	Counties Manukau	51
Waikato	28	Waikato	28
Lakes	1	Lakes	1
Bay of Plenty	7	Bay of Plenty	7
Tairāwhiti	2	Tairāwhiti	2
Taranaki	15	Taranaki	13
		Waikato	2
Mid Central	9	Mid Central	9
Hutt Valley	12	Counties Manukau	5
		Hutt Valley	7
Capital & Coast	3	Capital & Coast	2
		Taranaki	1
Nelson Marlborough	3	Nelson Marlborough	3
Canterbury	46	Canterbury	45
		Waikato	1
South Canterbury	3	South Canterbury	3
Southern	11	Southern	11
Total	228		228

DHBs are responsible for screening babies born within their DHB, and if they are referred to audiology the DHB of audiology is responsible for seeing the audiology assessment through to completion. Table 27 below outlines those babies that were referred for audiology and those that commenced. Tables 28 to 30 show the information by ethnicity, decile and birth location. Around half of babies of European that are referred to audiology do start assessment. Percentages in other ethnic groups are lower but not significantly different from each other given the number of babies included. There is no consistent trend by decile. Around half of those in deciles 3-6 start assessment in all other decile groups just over two thirds start assessment.

Table 27 Commenced audiology assessment by DHB and NICU/SCBU admission, April to September 2010

DHB of birth	Well Baby			NICU/SCBU			Total		
	Refer for Audiology	Commenced Audiology Assessment	Commenced Audiology Assessment to Refer for Audiology	Refer for Audiology	Commenced Audiology Assessment	Commenced Audiology Assessment to Refer for Audiology	Refer for Audiology	Commenced Audiology Assessment	Commenced Audiology Assessment to Refer for Audiology
Northland	20	8	40.0%	4	1	25.0%	24	9	37.5%
Waitemata	19	0	0.0%	4	0	0.0%	23	0	0.0%
Auckland	94	18	19.1%	40	11	27.5%	134	29	21.6%
Counties Manukau	100	41	41.0%	29	10	34.5%	129	51	39.5%
Waikato	29	20	69.0%	18	10	55.6%	47	30	63.8%
Lakes	13	1	7.7%	2	0	0.0%	15	1	6.7%
Bay of Plenty	9	5	55.6%	3	1	33.3%	12	6	50.0%
Tairāwhiti	2	1	50.0%	1	1	100.0%	3	2	66.7%
Taranaki	10	7	70.0%	7	7	100.0%	17	14	82.4%
Hawke's Bay	10	0	0.0%	11	0	0.0%	21	0	0.0%
Whanganui	6	0	0.0%	3	0	0.0%	9	0	0.0%
Mid Central	7	4	57.1%	7	5	71.4%	14	9	64.3%
Hutt Valley	5	4	80.0%	7	6	85.7%	12	10	83.3%
Capital & Coast	5	2	40.0%	4	2	50.0%	9	4	44.4%
Wairarapa	0	0	-	1	0	0.0%	1	0	0.0%
Nelson Marlborough	6	3	50.0%	2	0	0.0%	8	3	37.5%
West Coast	0	0	-	0	0	-	0	0	-
Canterbury	47	31	66.0%	17	15	88.2%	64	46	71.9%
South Canterbury	4	3	75.0%	0	0	-	4	3	75.0%
Southern	15	9	60.0%	2	2	100.0%	17	11	64.7%
Total	401	157	39.2%	162	71	43.8%	563	228	40.5%

Table 28 Commenced audiology assessment by ethnicity, April to September 2010

Ethnicity	Refer for Audiology	Commenced Audiology Assessment	Commenced Audiology Assessment to Refer for Audiology
Maori	167	64	38.3%
Pacific	111	34	30.6%
Asian	72	26	36.1%
European	197	98	49.7%
Other ethnic groups	16	6	37.5%
Total	563	228	40.5%

Table 29 Commenced audiology assessment by decile, April to September 2010

Decile	Refer for Audiology	Commenced Audiology Assessment	Commenced Audiology Assessment to Refer for Audiology
Decile 1-2	58	21	36.2%
Decile 3-4	70	35	50.0%
Decile 5-6	86	43	50.0%
Decile 7-8	137	51	37.2%
Decile 9-10	212	78	36.8%
Total	563	228	40.5%

Table 30 Commenced audiology assessment by birth location, April to September 2010

Birth Location	Refer for Audiology	Commenced Audiology Assessment	Commenced Audiology Assessment to Refer for Audiology
Public Hospital	552	221	40.0%
Private Hospital	1	0	0.0%
Home	10	7	70.0%
Total	563	228	40.5%

RECOMMENDATIONS ON AUDIOLOGY ASSESSMENT STARTED

There were no recommendations made by the Advisory Group.

1.7 Audiology assessment completed
<p>Description</p> <ol style="list-style-type: none"> 1. The proportion of eligible newborns that are referred from screening who complete the audiology assessment. 2. The number of eligible newborns that are referred from screening who complete the audiology assessment by 3 months of age.
<p>Relevant Outcome</p> <p>Eligible newborns that do not pass hearing screening should have the initial audiological assessment completed by 3 months of age.</p>
<p>Rationale</p> <p>The audiology assessment by 3 months of age is a core goal for the UNHSEIP (ie the 3 in the 1-3-6 goals) and is based on international benchmarks.</p> <p>There is, however, some variation with regards to international benchmarks as to whether the 3 months refers to audiology assessment <i>completed</i> or <i>started</i>. After discussion by the Monitoring, Policy and Indicators working group it was agreed that that completion of audiology assessment by 3 months of age should be the desired outcome.</p> <p>Providers should strive to complete the audiology assessment by 3 months of age for all newborns requiring this service.</p> <p>DHB and programme performance data for this indicator will be regularly reviewed, particularly from an inequalities perspective. The programme will work collaboratively with DHBs to improve performance as well as negotiating specific percentage targets if required.</p>
<p>Methodology</p> <p><i>Quantitative indicator 1.7a</i></p> <p>Numerator: Number of eligible newborns who complete audiology assessment.</p> <p>Denominator: Number of eligible newborns who commence audiology assessment.</p> <p><i>Quantitative indicator 1.7b</i></p> <p>Numerator: Number of eligible newborns who complete audiology assessment by 3 months of age.</p> <p>Denominator: Number of eligible newborns who complete audiology assessment.</p>

4.10. Audiology Assessment Completed

The number of audiology assessments completed and started is the same. This is because audiology forms are sent to the NSU only when the audiology assessment is complete. Data on audiology assessment completion by three months is variable, although with small numbers in many DHB's it is not useful to make any strong statements. Figure 10 below shows the percentage of babies who completed audiology along with the percent of those that completed who did so by 3 months. Figure 11 below identifies the spread of completion times for babies within audiology screening.

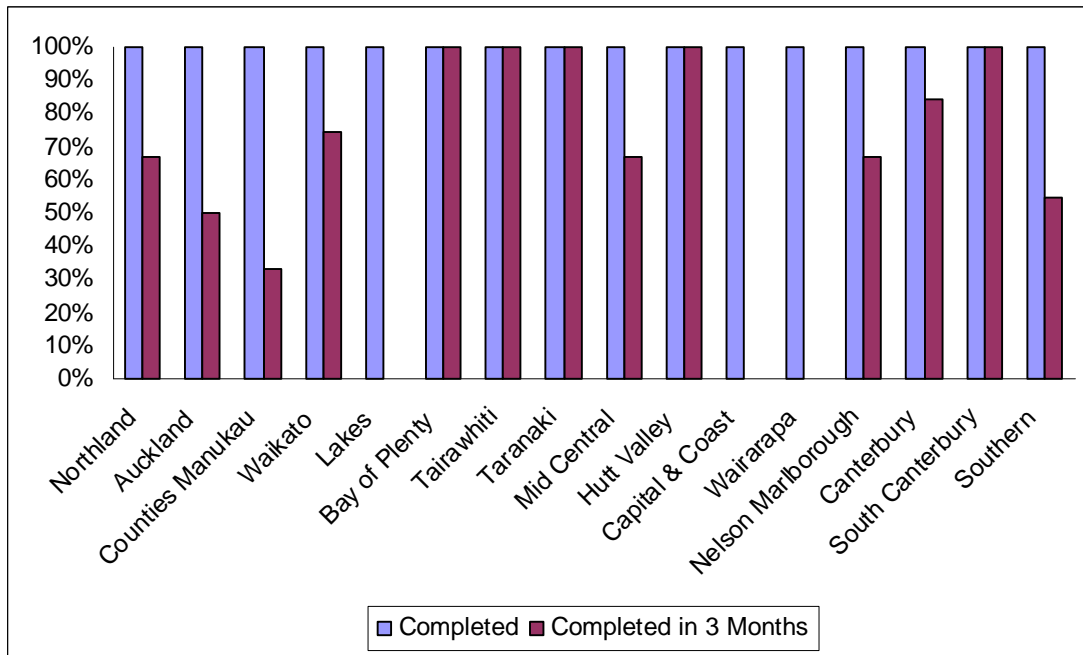


Figure 10 Proportion of babies who complete audiology, and the proportion who had completed audiology by the time they were three months of age, April to September 2010 by DHB of Audiology

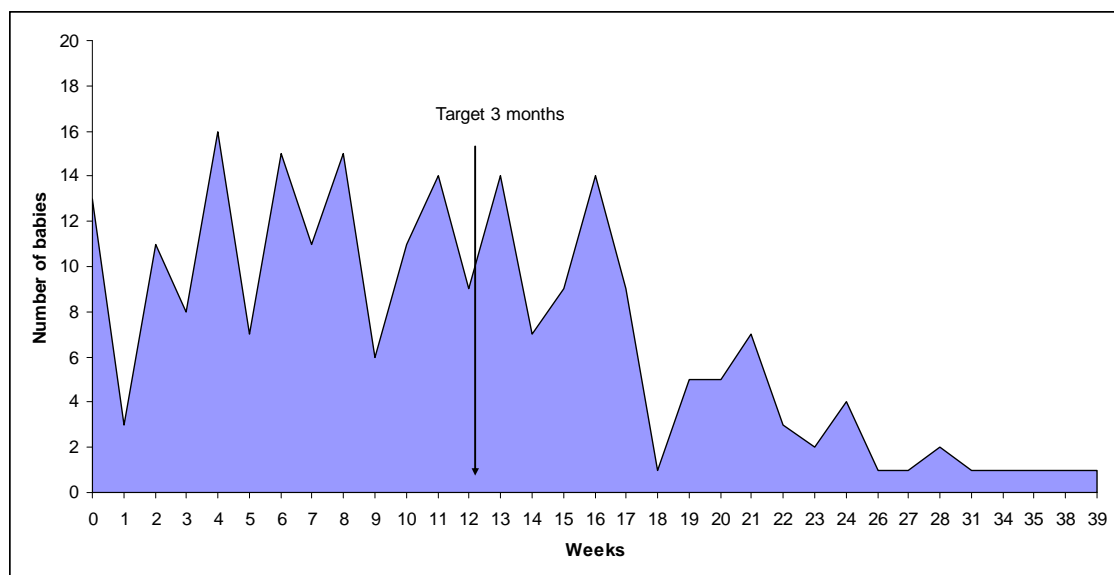


Figure 11 Spread of audiology completion times, April to September 2010

Table 31 Audiology Completed by DHB, April to September 2010

DHB of Audiology	Well Baby			NICU/SCBU			Total		
	Audiology Commenced	Audiology Completed	% Completed that commenced	Audiology Commenced	Audiology Completed	% Completed that commenced	Audiology Commenced	Audiology Completed	% Completed that commenced
Northland	8	8	100%	1	1	100%	9	9	100.0%
<i>Waitemata</i>									
Auckland	14	14	100%	10	10	100%	24	24	100.0%
Counties Manukau	47	47	100%	13	13	100%	60	60	100.0%
Waikato	22	22	100%	9	9	100%	31	31	100.0%
Lakes	1	1	100%	0	0	-	1	1	100.0%
Bay of Plenty	5	5	100%	2	2	100%	7	7	100.0%
Tairāwhiti	1	1	100%	1	1	100%	2	2	100.0%
Taranaki	6	6	100%	8	8	100%	14	14	100.0%
<i>Hawke's Bay</i>									
<i>Whanganui</i>									
Mid Central	4	4	100%	5	5	100%	9	9	100.0%
Hutt Valley	2	2	100%	5	5	100%	7	7	100.0%
Capital & Coast	2	2	100%	0	0	-	2	2	100.0%
<i>Wairarapa</i>									
Nelson Marlborough	3	3	100%	0	0	-	3	3	100.0%
<i>West Coast</i>									
Canterbury	30	30	100%	15	15	100%	45	45	100.0%
South Canterbury	3	3	100%	0	0	-	3	3	100.0%
Southern	9	9	100%	2	2	100%	11	11	100.0%
Total	157	157	100%	71	71	100%	228	228	100.0%

Table 32 Audiology Completed by three months of age by DHB, April to September 2010

DHB of Audiology	Well Baby			NICU/SCBU			Total		
	Audiology Completed	Completed Audiology by 3 months of age	% of completed by 3 month of age	Audiology Completed	Completed Audiology by 3 months of age	% of completed by 3 month of age	Audiology Completed	Completed Audiology by 3 months of age	% of completed by 3 month of age
Northland	8	5	62.5%	1	1	100.0%	9	6	66.7%
<i>Waitemata</i>									
Auckland	14	8	57.1%	10	4	40.0%	24	12	50.0%
Counties Manukau	47	12	25.5%	13	8	61.5%	60	20	33.3%
Waikato	22	15	68.2%	9	8	88.9%	31	23	74.2%
Lakes	1	0	0.0%	0	0	-	1	0	0.0%
Bay of Plenty	5	5	100.0%	2	2	100.0%	7	7	100.0%
Tairāwhiti	1	1	100.0%	1	1	100.0%	2	2	100.0%
Taranaki	6	6	100.0%	8	8	100.0%	14	14	100.0%
<i>Hawke's Bay</i>									
<i>Whanganui</i>									
Mid Central	4	3	75.0%	5	3	60.0%	9	6	66.7%
Hutt Valley	2	2	100.0%	5	5	100.0%	7	7	100.0%
Capital & Coast	2	0	0.0%	0	0	-	2	0	0.0%
<i>Wairarapa</i>									
Nelson Marlborough	3	2	66.7%	0	0	-	3	2	66.7%
<i>West Coast</i>									
Canterbury	30	25	83.3%	15	13	86.7%	45	38	84.4%
South Canterbury	3	3	100.0%	0	0	-	3	3	100.0%
Southern	9	4	44.4%	2	2	100.0%	11	6	54.5%
Total	157	91	58.0%	71	55	77.5%	228	146	64.0%

Factors such as ethnicity, deprivation status and birth location may influence completion rates, and/or the time taken for the completion for newborn hearing screening. The information presented in Tables 33-35 indicates some difference by ethnicity and decile. Namely the percentage of Pacific babies that complete by 3 months and those in decile groups 9-10 appears to be lower than for others.

Table 33 Audiology Screening Completed by Ethnicity, April to September 2010

Ethnicity	Audiology Commenced	Audiology Completed	Completed Audiology by 3 months of age	% Completed that commenced	% commenced that completed by 3 month of age
Maori	64	64	40	100%	62.5%
Pacific	34	34	10	100%	29.4%
Asian	26	26	13	100%	50.0%
European	98	98	78	100%	79.6%
Other ethnic groups	6	6	5	100%	83.3%
Total	228	228	146	100%	64.0%

Table 34 Audiology Screening Completed by Deprivation, April to September 2010

Decile	Audiology Commenced	Audiology Completed	Completed Audiology by 3 months of age	% Completed that commenced	% commenced that completed by 3 month of age
Decile 1-2	21	21	17	100%	81.0%
Decile 3-4	35	35	24	100%	68.6%
Decile 5-6	43	43	27	100%	62.8%
Decile 7-8	51	51	41	100%	80.4%
Decile 9-10	78	78	37	100%	47.4%
Total	228	228	146	100%	64.0%

Table 35 Audiology Screening Completed by Birth Location, April to September 2010

Birth Location	Audiology Commenced	Audiology Completed	Completed Audiology by 3 months of age	% Completed that commenced	% commenced that completed by 3 month of age
Public Hospital	221	221	141	100%	63.8%
Private Hospital	0	-	-	-	-
Home	7	7	5	100%	71.4%
Total	228	228	146	100%	64.0%

RECOMMENDATIONS ON AUDIOLOGY ASSESSMENT COMPLETED

9. The National Screening Unit is to follow-up with Northland, Auckland, Counties Manukau, Waikato, MidCentral, Capital and Coast, Nelson Marlborough, Canterbury and Southern DHBs about their audiology assessment completed by three months of age figures.

1.8 Hearing loss detected by audiology assessment

Description

This indicator reports the numbers/rate for permanent childhood hearing loss and classifies the loss into several categories (ie by severity and type of hearing loss).

Relevant Outcome

No minimum hearing loss detection outcome target for UNHSEIP at present (see rationale section). To be reviewed with subsequent reviews of Monitoring Framework.

Rationale

New Zealand Deafness Notification data on childhood hearing loss suggests that New Zealand's incidence of hearing loss is similar to international reports. However, there are some limitations to the data and the true extent of congenital hearing loss in New Zealand is currently unknown.

The New Zealand Deafness Notification data also suggests that Māori children are disproportionately represented in deafness notifications and are more likely to have mild hearing losses than other ethnic groups. Again, there are some uncertainties regarding these data.

Collecting detailed data on hearing loss will enable more accurate analyses, including assessing if there are inequalities in hearing loss with regards to ethnicity or deprivation status.

Most international programmes do not have a minimum detection of hearing loss rate. The potential requirement for a minimum detection rate will be revisited with subsequent reviews of the Monitoring Framework.

Methodology

Indicator 1.8

Numerator: Number of eligible newborns who had permanent childhood hearing loss confirmed by audiology assessment (and were referred through the UNHSEIP).

Denominator: Number of eligible newborns who completed audiology assessment (and were referred through the UNHSEIP).

4.11. Permanent/Congenital Hearing Loss Detected By Audiology Assessment

For this indicator, permanent/congenital hearing loss is defined by an audiology outcome of either 'Auditory Neuropathy' or 'Sensorineural' in at least one ear. Table 36 below summaries the results for the 11 babies for this indicator.

Table 36 Audiological Test Results by DHB

DHB of Audiology	Right Test Result	Left Test Result	Number of babies
Auckland	Sensorineural	Sensorineural	1
Counties Manukau	Sensorineural	Sensorineural	1
Waikato	Sensorineural	Normal	1
Waikato	Sensorineural	Sensorineural	1
Tairāwhiti	Sensorineural	Sensorineural	1
Capital & Coast	Sensorineural	Normal	1
Nelson Marlborough	Auditory Neuropathy	Normal	1
Canterbury	Normal	Sensorineural	1
Canterbury	Sensorineural	Normal	2
Canterbury	Sensorineural	Sensorineural	1
Total			11

Table 37 below indicates that 4.8 percent of babies that completed an audiology assessment had a permanent/congenital hearing loss detected.

Tables 38 to 40 outline the data by ethnicity, decile and birth location but again due to small numbers these are included as background information only. The numbers are too small to draw any conclusions but it interesting to see a small number of babies from NICU/SCBU with permanent hearing loss in this period.

Table 37 Permanent/Congenital Hearing Loss by DHB and Birth Location, April to September 2010

DHB of Audiology	Well Baby			NICU/SCBU			Total		
	Completed audiology	Permanent/Congenital hearing loss	Permanent hearing loss to completed audiology	Completed audiology	Permanent/Congenital hearing loss	Permanent hearing loss to completed audiology	Completed audiology	Permanent/Congenital hearing loss	Permanent hearing loss to completed audiology
Northland	8	0	0.0%	1	0	0.0%	9	0	0.0%
<i>Waitemata</i>									
Auckland	14	1	7.1%	10	0	0.0%	24	1	4.2%
Counties Manukau	47	1	2.1%	13	0	0.0%	60	1	1.7%
Waikato	22	2	9.1%	9	0	0.0%	31	2	6.5%
Lakes	1	0	0.0%	0	0	-	1	0	0.0%
Bay of Plenty	5	0	0.0%	2	0	0.0%	7	0	0.0%
Tairāwhiti	1	1	100.0%	1	0	0.0%	2	1	50.0%
Taranaki	6	0	0.0%	8	0	0.0%	14	0	0.0%
<i>Hawke's Bay</i>									
<i>Whanganui</i>									
Mid Central	4	0	0.0%	5	0	0.0%	9	0	0.0%
Hutt Valley	2	0	0.0%	5	0	0.0%	7	0	0.0%
Capital & Coast	2	1	50.0%	0	0	-	2	1	50.0%
<i>Wairarapa</i>									
Nelson Marlborough	3	1	33.3%	0	0	-	3	1	33.3%
<i>West Coast</i>									
Canterbury	30	3	10.0%	15	1	6.7%	45	4	8.9%
South Canterbury	3	0	0.0%	0	0		3	0	0.0%
Southern	9	0	0.0%	2	0	0.0%	11	0	0.0%
Total	157	10	6.4%	71	1	1.4%	228	11	4.8%

Table 38 Permanent/Congenital Hearing Loss by Ethnicity, April to September 2010

Ethnicity	Completed audiology	Permanent/ Congenital hearing loss	Permanent hearing loss to completed audiology
Maori	64	4	6.3%
Pacific	34	1	2.9%
Asian	26	1	3.8%
European	98	5	5.1%
Other ethnic groups	6	0	0.0%
Total	228	11	4.8%

Table 39 Permanent/Congenital Hearing Loss by Deprivation, April to September 2010

Decile	Completed audiology	Permanent/ Congenital hearing loss	Permanent hearing loss to completed audiology
Decile 1-2	21	1	4.8%
Decile 3-4	35	1	2.9%
Decile 5-6	43	2	4.7%
Decile 7-8	51	2	3.9%
Decile 9-10	78	5	6.4%
Total	228	11	4.8%

Table 40 Permanent/Congenital Hearing Loss by Birth Location, April to September 2010

Birth Location	Completed audiology	Permanent/ Congenital hearing loss	Permanent hearing loss to completed audiology
Public Hospital	221	10	4.5%
Private Hospital	-	-	-
Home	7	1	14.3%
Total	228	11	4.8%

RECOMMENDATIONS ON HEARING LOSS DETECTED BY AUDIOLOGY ASSESSMENT

There were no recommendations made by the Advisory Group.

4.12. Newborns with Conductive or Mixed Hearing Loss

This indicator has been used to capture all the outcomes from audiology which were not 'Auditory Neuropathy' or 'Sensorineural' in at least one ear, or "Normal". In this early stage of reporting audiology, all information will be presented, however over time, some amalgamation of categories may be recommended. Table 41 summarises the audiology results for 55 babies.

Table 41 Audiology Test Results by DHB of Audiology

DHB of Audiology	Right Test Result	Left Test Result	Number of Babies
Northland	Conductive Temporary	Conductive Temporary	1
Northland	Conductive Temporary	Not Yet Determined	1
Northland	Normal	Mixed	1
Auckland	Conductive Temporary	Normal	1
Auckland	Normal	Conductive Temporary	1
Counties Manukau	Conductive Temporary	Normal	9
Counties Manukau	Conductive Temporary	Conductive Temporary	3
Counties Manukau	Conductive Temporary	Not Yet Determined	1
Counties Manukau	Normal	Conductive Temporary	2
Counties Manukau	Not Yet Determined	Conductive Temporary	1
Waikato	Conductive Temporary	Normal	1
Waikato	Conductive Temporary	Conductive Temporary	7
Waikato	Conductive Temporary	Normal	1
Waikato	Mixed	Mixed	1
Waikato	Normal	Conductive Temporary	1
Waikato	Not Yet Determined	Conductive Temporary	1
Bay of Plenty	Conductive Temporary	Not Yet Determined	1
Bay of Plenty	Conductive Temporary	Conductive Temporary	1
Taranaki	Conductive Temporary	Not Yet Determined	1
Mid Central	Conductive Temporary	Conductive Temporary	1
Canterbury	Conductive Temporary	Conductive Temporary	5
Canterbury	Conductive Temporary	Not Yet Determined	1
Canterbury	Conductive Temporary	Normal	1
Canterbury	Normal	Conductive Temporary	5
Southern	Conductive Temporary	Not Yet Determined	4
Southern	Conductive Temporary	Mixed	1
Southern	Not Yet Determined	Conductive Temporary	1
Total			55

Table 42 identifies 24.1% of babies that completed audiology assessment had some kind of hearing loss, excluding sensorineural and auditory neuropathy. As with other data in the audiology section of this report numbers are too small to make and clear comments though it appears there is little difference in the rates across DHBs for babies in NICU/SCBU and all babies.

No strong differences appear around ethnicity, deprivation or birth location Tables 43 to 45.

Table 42 Conductive or Mixed Hearing Loss by DHB, April to September 2010

DHB of Audiology	Well Baby			NICU/SCBU			Total		
	Completed audiology	Conductive / Mixed hearing Loss	Conductive / Mixed hearing loss to completed audiology	Completed audiology	Conductive/ Mixed hearing Loss	Conductive / Mixed hearing loss to completed audiology	Completed audiology	Conductive / Mixed hearing Loss	Conductive / Mixed hearing loss to completed audiology
Northland	8	3	37.5%	1		0.0%	9	3	33.3%
<i>Waitemata</i>									
Auckland	14	1	7.1%	10	1	10.0%	24	2	8.3%
Counties Manukau	47	12	25.5%	13	4	30.8%	60	16	26.7%
Waikato	22	8	36.4%	9	4	44.4%	31	12	38.7%
Lakes	1	0	0.0%	0	0	-	1	0	0.0%
Bay of Plenty	5	1	20.0%	2	1	50.0%	7	2	28.6%
Tairāwhiti	1	0	0.0%	1	0	0.0%	2	0	0.0%
Taranaki	6	0	0.0%	8	1	12.5%	14	1	7.1%
<i>Hawke's Bay</i>									
<i>Whanganui</i>									
Mid Central	4	1	25.0%	5	0	0.0%	9	1	11.1%
Hutt Valley	2	0	0.0%	5	0	0.0%	7	0	0.0%
Capital & Coast	2	0	0.0%	0	0	-	2	0	0.0%
<i>Wairarapa</i>									
Nelson Marlborough	3	0	0.0%	0	0	-	3	0	0.0%
<i>West Coast</i>									
Canterbury	30	7	23.3%	15	5	33.3%	45	12	26.7%
South Canterbury	3	0	0.0%	0	0		3	0	0.0%
Southern	9	5	55.6%	2	1	50.0%	11	6	54.5%
Total	157	38	24.2%	71	17	23.9%	228	55	24.1%

Table 43 Conductive or Mixed Hearing Loss by Ethnicity, April to September 2010

Ethnicity	Completed audiology	Conductive/ Mixed hearing Loss	Conductive / Mixed hearing loss to completed audiology
Maori	64	18	28.1%
Pacific	34	9	26.5%
Asian	26	6	23.1%
European	98	21	21.4%
Other ethnic groups	6	1	16.7%
Total	228	55	24.1%

Table 44 Conductive or Mixed Hearing Loss by Deprivation, April to September 2010

Decile	Completed audiology	Conductive/ Mixed hearing Loss	Conductive / Mixed hearing loss to completed audiology
Decile 1-2	21	4	19.0%
Decile 3-4	35	9	25.7%
Decile 5-6	43	11	25.6%
Decile 7-8	51	15	29.4%
Decile 9-10	78	16	20.5%
Total	228	55	24.1%

Table 45 Conductive or Mixed Hearing Loss by Birth Location, April to September 2010

Birth Location	Completed audiology	Conductive/ Mixed hearing Loss	Conductive / Mixed hearing loss to completed audiology
Public Hospital	221	53	24.0%
Private Hospital	-	-	-
Home	7	2	28.6%
Total	228	55	24.1%

RECOMMENDATIONS ON CONDUCTIVE OR MIXED HEARING LOSS DETECTED BY AUDIOLOGY ASSESSMENT

There were no recommendations made by the Advisory Group.

1.9 Age at identification of hearing loss

Description

The average age at which hearing loss is confirmed by audiology assessment.

Relevant Outcome

The relevant outcome is the UNHSEIP aim of lowering the age at which hearing loss is detected to 3 months of age or less.

Rationale

With newborn hearing screening, the internationally recommended age for the diagnosis of hearing loss is three months, with intervention commencing by six months.

While New Zealand's incidence of hearing loss is likely to be similar to international reports, New Zealand Deafness Notification data (National Audiology Centre, 2005; 2007) showed that the age of identification has been late, particularly when compared with countries that have introduced newborn hearing screening programmes.

Data from the 2004 New Zealand Deafness Notification Database indicated that only 6% of babies with hearing loss are identified by six months of age, and that the average age of detection was nearly four years of age (National Audiology Centre, 2005). There is also evidence of inequalities with the identification of hearing loss in Māori and Pacific children occurring even later.

This indicator will assess if the UNHSEIP is achieving its aim of lowering the age at which hearing loss is detected to 3 months of age or less.

Methodology

Indicator 1.9

Average age of eligible newborns (in weeks) at which hearing loss was confirmed by audiology assessment.

4.13. Age At Identification of Hearing Loss

The aim of the UNHSEIP is to have hearing loss detected by the time the baby is 3 months of age. As can be seen Table 32 above around 64 percent of babies do have their audiology assessment completed by three months of age. Table 46 below identifies the age of identification is spread across months, based on the corrected age of the baby.

Table 46 Count of average age at identification of hearing loss, by DHB and Protocol, April to September 2010

DHB of Audiology test	Well Baby				NICU/SCBU				All Babies				Total
	By 4 weeks	By 8 weeks	By 12 weeks	Over 12 weeks	By 4 weeks	By 8 weeks	By 12 weeks	Over 12 weeks	By 4 weeks	By 8 weeks	By 12 weeks	Over 12 weeks	
Northland	0	1	1	1	0	0	0	0	0	1	1	1	3
Auckland	0	0	1	1	0	1	0	0	0	1	1	1	3
Counties Manukau	1	0	1	11	1	1	1	1	2	1	2	12	17
Waikato	0	1	3	6	1	2	1	0	1	3	4	6	14
Tairāwhiti	1	0	0	0	0	0	0	0	1	0	0	0	1
Taranaki	0	0	0	0	1	0	0	0	1	0	0	0	1
Bay of Plenty	0	0	1		1	0	0	0	1	0	1	0	2
Capital & Coast	0	0		1	0	0	0	0	0	0	0	1	1
Mid Central	0	1	0	0	0	0	0	0	0	1	0	0	1
Nelson Marlborough	0	1	0	0	0	0	0	0	0	1	0	0	1
Canterbury	0	4	5	1	3	1	1	1	3	5	6	2	16
Southern	0	0	1	4	1	0	0	0	1	0	1	4	6
Total	1	8	13	25	8	5	3	2	9	13	16	27	66

RECOMMENDATIONS ON AGE AT HEARING LOSS DETECTED

There were no recommendations made by the Advisory Group.

5. Indicators not yet included in monitoring

Comment: this will be possible to report in the future, but the data is not yet available

1.10 Age at first assistive hearing device
Description The age at which the first assistive hearing device ² is fitted.
Relevant Outcome No outcome target for the programme at present (see rationale section).
Rationale “Initiation of appropriate medical and audiological services; and Early Intervention education services by 6 months of age” is a core goal of UNHSEIP: ie the 6 part of the 1-3-6 goals. It is common for international programmes to monitor factors around hearing aid fitting, cochlear implants and follow-up. This indicator will be reviewed as data are collected, as well as, consideration of other potential medical indicators and the introduction of specific age/percentage outcome targets.
Methodology <i>Indicator 1.10a – All Devices</i> Average age of eligible children at which the first assistive hearing device was fitted. <i>Indicator 1.10b – Hearing Aids</i> Average age of eligible children at which a hearing aid was first fitted. <i>Indicator 1.10c – Cochlear Implants</i> Average age of eligible children at which a cochlear implant was first fitted ³ .

² An assistive hearing device includes: hearing aids, cochlear implants, or FM amplification systems.

³ It is expected that the average age for cochlear implants (Indicator 10c) would be much later than the average age for hearing devices (Indicator 10b).

1.12 Newborns with mild or unilateral hearing loss	
Description	The number of newborns with confirmed mild or unilateral hearing loss by audiology assessment.
Relevant Outcome	Eligible newborns with hearing loss detected through the UNHSEIP, but who do not require medical intervention or who are not eligible for Early Intervention education services (ie children with mild or unilateral hearing loss), need to be followed-up in the long-term.
rationale	The UNHESIP needs to monitor the number of children who have had hearing loss confirmed by audiology assessment, but who did not require immediate medical intervention and who did not meet the eligibility criteria for Early Intervention services (ie children with mild or unilateral hearing loss).
Methodology	<p>Indicator 1.12</p> <p>Numerator: Number of newborns who had hearing loss confirmed by audiology assessment, but did not require medical intervention or meet the eligibility criteria for Early Intervention services.</p> <p>Denominator: Number of newborns who completed audiology assessment (and were referred through the UNHSEIP).</p>

Indicators for the Early Intervention Education Service

This section outlines the draft Early Intervention education service measures, developed by Group Special Education from the Ministry of Education.

2.1 Responsiveness following referral to EI education services

Description

The time taken for the Early Intervention education service to attempt to contact the families and whānau of children eligible for, and referred to, the service following diagnosis through Universal Newborn Hearing Screening (UNHS).

Relevant Outcome (Target)

Early Intervention staff will attempt to contact 95% of families and whānau of children eligible for, and referred to, the Early Intervention education service following diagnosis through UNHS within two full working days of receipt of referral at a district MoE Special Education office.

Rationale

The MoE Special Education Service Model for children with hearing loss diagnosed following newborn hearing screening states that two working days is the desired protocol.

The target is worded as “attempt to contact” as despite the best efforts of staff, a family or whānau may be away from their usual place of residence or not answering their phone during these first 2 days. It is important that the efforts of staff to follow the protocol is measured, not the availability of families and whānau.

Two working days has been chosen rather than one to reduce the impact of factors beyond the control of staff on the indicator, for example, sickness, attendance at professional development events and the considerable out-of-office time involved in delivering a home and school-based service over a sometimes large geographic area.

Some families and whānau do not have access to telephones, cellphones, fax or email. Nationally, 2% of families and whānau do not have access to telecommunications. In some districts this is higher, for example, 4.9% of families and whānau in the Far North and 4% of families and whānau in Gisborne. In these instances, Early Intervention staff will attempt to contact families and whānau by letter or by visiting the home.

Methodology

Indicator 2.1

Numerator: Number of families and whānau of children eligible for, and referred to, the Early Intervention education service (through

UNHS) who staff attempt to contact within two full working days of receipt of referral at a district MoE Special Education office.

Denominator: Number of families and whānau of children eligible for, and referred to, the Early Intervention education service (through UNHS).

Notes:

- Staff are required to record and date the attempts made to contact the families and whānau of children referred following diagnosis from the screening programme. This information is recorded in the individual child's file and on the district UNHSEIP data sheet.
- This data will be broken down by ethnicity to allow progress toward reducing inequalities to be assessed.
- When the target is not met, staff will be asked to report the reasons why. This information will be used to inform the refinement of the Monitoring Framework and inform service delivery protocols and practices.

2.2 Engagement in EI education service

DESCRIPTION

The time taken for children eligible for, and referred to, the Early Intervention education service following diagnosis (through UNHS) to be enrolled in Early Intervention education services.

RELEVANT OUTCOMES (TARGETS)

Outcome One - 90% of children referred to, and eligible for, the Early Intervention education service will have begun receiving a service by one month following the receipt of the referral in a district MoE Special Education office.

Outcome Two - 90% of children referred to the Early Intervention education service by 5 months of age, and eligible for a service, will have begun receiving a service by 6 months of age.

RATIONALE

The MoE Special Education Service Model for children with hearing loss diagnosed following newborn hearing screening states that on contacting the family or whānau, staff offer to visit them at home or to meet them at the information sharing appointment, depending on parental preference. Initial informed consent is then obtained from the family or whānau. Once consent is given, the family or whānau are considered to be in receipt of Early Intervention services.

A benchmark of 90% aligns with the JCIH 2007 Position Statement recommendation that 90% of infants who qualify for Part C have an IFSP (Individualized Family Service Plan) signed by their parents by 6 months of age.

Outcome one measures the timeliness with which all children diagnosed following screening are engaged in Early Intervention education services.

Outcome two is in accordance with the international standard of screening by 1 month of age, diagnosis by 3 months and intervention by 6 months. This allows us to compare our programme with overseas programmes which report on their success or otherwise of meeting the 1-3-6 standard.

METHODOLOGY

Indicator 2.2a

Numerator: Number of children eligible for, and referred to, the Early Intervention education service who began receiving a service by one month following receipt of the referral at a district MoE Special Education office.

Denominator: Number of children eligible for, and referred to, the Early Intervention education service following diagnosis through UNHS.

Indicator 2.2b

Numerator: Number of children under 5 months of age who were eligible for, and referred to, the Early Intervention education service who began receiving a service by 6 months of age.

Denominator: Number of children under 5 months of age eligible for, and referred to, the Early Intervention education service following diagnosis through UNHS.

NOTE:

This data would be broken down by ethnicity to allow progress toward reducing inequalities to be assessed.

2.3 Retention of children in the EI education service through the early childhood years

Description

The percentage of children referred to, and eligible for, the Early Intervention education service following UNHS who are still receiving a service at 3 years and at school entry.

Relevant Outcome

The percentage of children referred to, and eligible for, the Early Intervention education service following UNHS will still be receiving a service at 3 years and at school entry.

Rationale

This measure provides information about the percentage of children who enter the Early Intervention service following diagnosis who remain in the service through the foundation stage of communication development, birth to three years, and through to school entry.

Methodology

Indicator 2.3a

Numerator: Number of children referred to, and eligible for, the Early Intervention education service (through UNHS) still receiving a service at 3 years of age.

Denominator: Number of families and whānau of children eligible for, and referred to, the Early Intervention education service (through UNHS).

Indicator 2.3b

Numerator: Number of children referred to, and eligible for, the Early Intervention education service (through UNHS) still receiving a service at school entry.

Denominator: Number of families and whānau of children eligible for, and referred to, the Early Intervention education service (through UNHS).

NOTES:

Measuring this indicator presents a challenge to the MoE Special Education given its current information system. This system was set up to report on particular aspects of service delivery required by the organisation, and the above measure is different to those supported by current systems. MoE Special Education will investigate how this might be achieved, and if necessary, the wording of the retention measure may need to be altered to reflect the information we are able to retrieve from our information systems.

As the Early Intervention education service is a national service, families and

whānau moving within New Zealand are able to continue receiving service.

Most current families and whānau of children with hearing loss remain involved with the service throughout the early childhood and school years.

Interpretation of the data highlighted by this measure needs to be done so in a considered way. The reasons for withdrawal will be noted. For example, families and whānau may withdraw from the service because they are emigrating or because their child has age-appropriate development.