

**Quality
improvement
review of a
screening event in
the Universal
Newborn Hearing
Screening and
Early Intervention
Programme
December 2012**

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Purpose / Terms of Reference

At the request of the Director, National Services Purchasing, the National Screening Unit, with the input of an Incident Review Group, undertook a review of an event in the Universal Newborn Hearing Screening and Early Intervention Programme (UNHSEIP).

Between July and November 2012 an issue in the screening pathway was identified whereby approximately 2,000 babies between 2009- 2012 were not screened correctly for permanent congenital hearing loss. The scope of the review was as follows.

1. To describe and document the incident and outcomes.
2. To as far as possible understand the causal factors of the non- protocol screening.
3. To identify contributory factors that may increase the potential for non-protocol screening, including organisational and national level factors.
4. To identify recommendations for changes in DHB service provision that will enhance screener quality assurance.
5. To identify recommendations for changes to the national provision of the UNHSEIP that will strengthen the programme and reduce the likelihood of similar events.
6. To make any other recommendations based on the information obtained during the course of the review.

Abbreviations

AABR	Automated Auditory Brainstem Response
ADHB	Auckland District Health Board
AOAE	Automated Otoacoustic Emissions
BOPDHB	Bay of Plenty District Health Board
CDHB	Canterbury District Health Board
UNHSEIP	Universal Newborn Hearing Screening & Early Intervention Programme
DHB	District Health Board
DNA	Did not attend
DPOAE	Distortion Product Otoacoustic Emissions
ENT	Ear Nose and Throat
FTE	Full time equivalent
HVDHB	Hutt Valley District Health Board
LMC	Lead Maternity Carer
MOH	Ministry of Health
NHS	National Health Service
NHSP	Newborn Hearing Screening Programme
NICU	Neonatal Intensive Care Unit
NPQS	National Policy and Quality Standards
NSU	National Screening Unit
NZQA	New Zealand Qualifications Authority
SAC	Severity Assessment Criteria
SCBU	Special Care Baby Unit
TEP	Technical Expert Panel

Glossary

Automated auditory brainstem response (AABR) testing: A hearing screening test that measures the response of the auditory nerve and brainstem auditory centres to auditory stimuli. Sensors are positioned on the scalp and shoulder and clicking sounds delivered through ear cups or an ear cushion. The test takes about 15-20 minutes.

Automated otoacoustic emissions (AOAE) testing: A hearing screening test that measures the otoacoustic emission response produced by the outer hair cells of the cochlea to a stimulus (a click or soft tone) played through a small probe placed into the baby's ear. The response is detected by a small microphone within the probe.

Cochlear implant: An assistive hearing device for people with severe to profound hearing loss which is constructed in two parts. The electrode is inserted into the cochlear (the innermost part of the ear) and stimulates the nerve cells of the cochlear directly. The processor sits on the skin and passes electrical signals through the skin to the electrode.

Conductive hearing loss: Hearing loss caused by interference with sound transmission anywhere along the route through the outer ear canal to the eardrum and the ossicles of the middle ear. This type of hearing loss can often be corrected medically or surgically.

Congenital: Occurring before, at, or shortly after birth.

Did Not Attend (DNA): Where verbal confirmation of a hearing screening or assessment appointment has been given or received, but the appointment was not kept. For the outcome of 'DNA' to be confirmed, three attempts must have been made for the family to attend an appointment.

Distortion-product otoacoustic emissions (DPOAEs) A type of otoacoustic emission. DPOAEs are generated in the cochlea in response to a pair of tones of a given frequency and sound pressure level presented in the ear canal.

False negative: A negative screening test in a person who does have the condition being screened for.

Frequency: The number of vibrations or sound waves per second of a sound. Frequency, expressed in hertz, determines the pitch of the sound.

Otitis media: A common childhood condition caused by acute or chronic inflammation of the tissues lining the middle ear cavity. Otitis media may cause temporary hearing impairment which can evolve into permanent impairment if there is erosion of the middle ear structures. Otitis media with effusion is a chronic build-up of fluid in the middle ear which can lead to mild to moderate hearing loss.

Progressive hearing loss: When loss of hearing occurs over time. A pass in newborn hearing does not necessarily mean that the baby's hearing will always be good. Hearing loss may start as mild and later become moderate or severe, or the onset of a hearing loss may be delayed.

Risk factors: A range of identified conditions, syndromes, family history and medications that increase the risk of congenital, late onset and progressive hearing loss.

Screening pathway: The pathway in an organised screening programme that starts with giving information about the programme, and moves to an invitation to participate in the programme, the screening and in some cases recall for another screen. If the result of the screen indicates further assessment is required, the pathway includes referral for further assessment.

Sensorineural hearing loss: Hearing loss caused by the damage to the inner ear (cochlea) and or the nerve pathways from the inner ear to the brain. Most of the time sensorineural hearing loss cannot be medically or surgically corrected, and a hearing aid or cochlear implant is required. This type of hearing loss can range from mild to profound.

Executive Summary

Since 2010 all 20 district health boards (DHBs) have offered hearing screening to newborns as part of the Universal Newborn Hearing Screening and Early Intervention Programme (UNHSEIP). The programme aims to identify babies with moderate to severe permanent hearing loss early, so they and their families can access timely intervention to support the development of speech and language.

Summary of the event

Eight newborn hearing screeners across six DHBs have been identified as not screening babies according to known programme protocols, potentially leading to missed detection of a hearing loss among these babies. The screeners were not conforming to screening protocol in one or more of three ways, each resulting in the baby appearing to have successfully completed the hearing test:

- screening the same ear of a baby twice
- screening one ear of the baby, and then testing one of the screener's own ears as if it were the baby's other ear
- testing both of his / her own ears, in place of the baby's ears.

Approximately 108 newborn hearing screeners work in the UNHSEIP and about 60,000 babies are screened each year.

The National Screening Unit (NSU) was notified of the first two screeners in July – August 2012. The remaining screeners were identified as a result of a DHB audit of individual screener data requested by the NSU, which is on-going. The incident occurred over the period March 2009 to November 2012.

The NSU is strengthening a range of quality improvement measures to prevent this incident recurring.

Impact

A total of approximately 2,000 babies have been identified as not being screened correctly. Through the review undertaken the incident was assigned a severity assessment rating of two¹.

All babies identified as incorrectly screened have been, or are in the process of being, invited for re-screening.

Actual harm arising from the incident is small. Moderate or more severe congenital hearing loss affects approximately one baby per 1,000. At the time of this report, one re-screened baby has been identified, at 10 months old, with a sensorineural hearing loss that should have been detected

¹ Based on the New Zealand Incident Management System Severity Assessment Code

earlier. While diagnosis of hearing loss at 10 months is not ideal, the age of the child at diagnosis is still early and any impact on the social, language and other development of the child would be small. The baby is to have a cochlear implant (refer to glossary) at 12 months old.

Incident management and review

A Technical Expert Panel was set up to independently review the results of audits of individual screener data submitted by each DHB.

The Ministry of Health's review of the incident has focused on understanding the underlying factors of the screener behaviour as well as contributory organisational factors, and on identifying changes that will strengthen quality assurance of newborn hearing screening. A multidisciplinary Incident Review Group guided the review and endorsed recommendations. This group was independently chaired by the Group Manager, Quality, Auckland District Health Board.

The review was informed by a similar incident overseas, DHB reports, visits to selected DHBs, interviews and a national survey of screeners.

Key findings

While a wide range of programme and individual screener performance monitoring was in place for the UNHSEIP prior to the incident, markers for identifying screening adult ears had not been identified, as the practice was not anticipated.

No correlation was found between the way the programme has been managed in DHBs and the occurrence of non-protocol practice by screeners; nevertheless areas of the programme that could be strengthened to prevent similar events were identified.

The review found that the incident was not linked to screener competence. Additionally, no pattern of contributory individual factors was identified that could explain why screeners might choose not to follow known screening protocols. The following factors were found to be significant in the occurrence of the incident:

- *Individual factors* – While most screeners reported that their job was important, interesting and rewarding, the review uncovered a large range of potential stressors in the role including pressure to complete screens in the immediate post-natal period, environmental conditions and pay scales. Known physical, mental, emotional stressors in the screeners' lives may also have predisposed to the behaviour.
- *Training/education* – There is a lack of training and support for the co-ordinator role and for continued development of screeners.
- *Resource constraints* – Resource constraints on development of a national, accessible data system, and on FTE allocation for screeners and co-ordinators, impact on the screener role.
- *Programme management* – Visibility of, and accountability for, newborn hearing screening beyond the service level in DHBs is often low.
- *The absence of individual screener monitoring and awareness of monitoring.* An audit tool for individual screener data analysis and screeners aware of such monitoring would have minimised occurrence of the incident.

- *An AOAE/AABR screening protocol* – For technical reasons, if a different screening protocol was used for the programme (AABR only), the incident could not have occurred. AABR only protocols are used in a number of comparable programmes but were assessed as not cost-effective at the time of UNHSEIP establishment.

Recommendations

The Incident Review Group endorsed a total of 21 recommendations in relation to the factors identified above, some aiming to improve DHB service provision and some strengthening leadership and surveillance of the programme by the NSU.

Recommendation for the screening protocol

1. The NSU must reassess the screening protocol with a view to changing to an AABR only protocol.

Recommendations for individual screener monitoring

2. The NSU must operationalise the data monitoring requirements in the updated UNHSEIP NPQS within the next three months and monitor their effectiveness. In the interim DHBs must continue to use the protocol designed for the data audit and report outcomes to the NSU.
3. The NSU must continue to provide resources and regular training to ensure programme coordinators are skilled in the monitoring of screening data downloads.
4. DHBs must make screeners aware they are being monitored through openness about the routine monitoring processes.
5. The NSU should lead an assessment of residual risk to the programme from screener performance.

Recommendations for the screener role

6. The NSU should lead development of a guide for recruitment of newborn hearing screeners.
7. DHBs should be proactive in providing training opportunities for screeners and reducing stress that may impact on screeners' ability to do their work including:
 - ensuring that the workload of screeners enables a quality screening service, assessing the priority to screen prior to discharge and whether adequate alternatives to postnatal ward screening are provided
 - facilitating regular opportunities for screeners to retrain in programme protocol as well as areas identified in the screener survey as difficult e.g. dealing with difficult clients
 - timely follow-up of recommendations arising from compliance audits on environmental conditions and IT processes
 - providing information to screeners about services available to manage stress

- increasing awareness, respect and support for the screeners' role among maternity service teams.
8. DHBs should consider the remuneration framework for screeners in relation to comparable roles and level of responsibility and skill, looking at opportunities for consistency in screener pay scales nationally as well as options for a career path for screeners who are keen to further develop their skills.
 9. The NSU must implement the Newborn Hearing Screener Competency Framework for all screeners within the next six months.
 10. The NSU must review the material covered in screener training and continuing professional development with a view to including more about the ethics and theory of screening.
 11. The NSU should reconsider operational policies for daily checking of screening equipment and provision of results of the screen to parents.
 12. The NSU must lead updating of the screener scripts to be more concise, clear and in plain English, and/or investigate other modes of delivering information about the programme to families.

Recommendations for the co-ordinator role

13. The NSU and DHBs need to ensure that co-ordination of the UNHSEIP is adequately resourced. Sufficient time must be available for a co-ordinator and/ or lead screener to have a strong focus on monitoring of individual screener and programme data, and on continuing professional development of screeners.
14. New UNHSEIP co-ordinators must be provided with a co-ordinator manual and be required to do components of the screener training. The NSU should facilitate regular practical training for co-ordinators and regular opportunities for co-ordinators to communicate.
15. The NSU and DHBs must review processes for information dissemination to ensure co-ordinators are aware of all developments in the programme.

Recommendations for audiology

16. DHBs should promote the engagement of audiologists with the UNHSEIP and a supportive working relationship with screeners through:
 - audiologist support for programme monitoring, clinical queries and in-service training for screeners
 - ensuring audiologists provide feedback to screeners on babies screened
 - orientation to audiology for new screeners.

Recommendations for programme management

17. DHBs must have clearly defined lines of management and accountability for UNHSEIP services, as per the UNHSEIP National Policy and Quality Standards.

18. DHBs need to support the programme by facilitating strong links with relevant teams within the DHB, for example quality and maternity teams.
19. DHBs must establish a clear multi-disciplinary clinical governance framework for the UNHSEIP within the DHB. Regular meetings are recommended.
20. A national centralised database that is accessible to DHBs would facilitate streamlined and accurate quality monitoring and should be fast-tracked.
21. Once the recommendations are accepted, the NSU must develop an implementation plan in consultation with the UNHSEIP Advisory Group, who should monitor and review implementation of the recommendations for completion.

The Incident Review Group believes that the recommendations set out in this report will strengthen the Universal Newborn Hearing Screening and Early Intervention Programme.

Section 1: Incident Overview

The Universal Newborn Hearing Screening and Early Intervention Programme (UNHSEIP) aims to identify permanent congenital hearing loss that is likely to impact on the development of a child's speech and language. The goal is for all babies in New Zealand to have a hearing screen completed before the age of one month, diagnostic audiology testing for those without a clear response by three months, and early intervention services initiated by six months. The programme is overseen by the National Screening Unit (NSU) of the Ministry of Health and delivered by all 20 District Health Boards (DHBs). It was implemented over a three year period between 2007 and 2010. Approximately 94% of parents/guardians are now offered this screening for their newborns and approximately 89% of babies have a hearing screen completed.

The NSU was notified between July and November 2012 of a total of eight newborn hearing screeners who were found to have not screened babies according to known programme protocols. These screeners have either repeated the hearing screen of the baby's first ear screened, screened one of the baby's ears followed by their own ear, or in some instances screened only their own ears, so that the baby appears to have successfully completed the hearing test and does not require a second stage screening test and/or referral to audiology².

At the time of this report, screeners using at least one of the above practices have been identified in six DHBs, and the process of reviewing screener data in all DHBs is on-going. The six DHBs are:

- Auckland DHB (ADHB)
- Hutt Valley DHB (HVDHB)
- Canterbury DHB (CDHB)
- Lakes DHB (Lakes DHB)
- Bay of Plenty DHB (BOP DHB)
- Waitemata DHB (WDHB).

Impact

Across the six DHBs a total of 2,064 babies have been identified as not being screened according to protocol, potentially delaying detection of hearing loss among these babies. All of these babies have been or are in the process of being invited for re-screening by the DHBs concerned. Two of the DHBs have also sent invitations for a hearing re-screen to all babies who were ever screened by the screener. In total, this has resulted in the recall of 3,422 babies to date.

² A range of screener practices may be classed as 'not according to protocol', however in this report 'not following protocol' or 'non-protocol practice' refers to any or all of these scenarios.

In some cases non-protocol practice has been identified in babies screened early in the programme's establishment, which means that a small number of these babies are now two - three years old.

The incident affected only the protocol for well babies without identified risk factors for progressive hearing loss. Babies who have been in special care unit and/or have identified risk factors for hearing loss have a different screening protocol and were not involved.

Eight screeners have been identified as practising non-protocol screening out of a total newborn hearing screener workforce of about 108.

Table 1: Number of babies screened and incorrectly screened by each screener

	Total number of babies screened by this screener since commencing employment (approximate)	Total number of babies with non-protocol screening
Screener A	1263	421
Screener B	949	176
Screener C	1516	517
Screener D	650	76
Screener E	2275	80
Screener F	1300	222
Screener G	1270	542
Screener F	to be determined	20

As a guide, it is estimated that non-protocol screening has occurred in 1.4% of all babies who have completed screening in New Zealand since the programme began full implementation across all DHBs in 2010.

Risks identified at notification of the incident

<i>Missed hearing loss</i>	If hearing loss goes undetected or is treated late, it may result in delayed speech, language and other development of the child. Moderate or more severe congenital hearing loss affects approximately one baby per 1,000. The risk in well babies without identified risk factors is significantly less than this. The risk is therefore very low for individual babies, however across the six DHBs there may be 1-2 babies with a delayed or missed diagnosis of permanent congenital hearing loss as a result of this incident.
<i>Local/national adverse publicity</i>	The incident has the potential to impact on the reputation of the UNHSEIP and the level of confidence that families have in newborn hearing screening, potentially leading to reduced engagement in screening. This risk was judged to be moderate.
<i>Potential for other non-protocol screening</i>	On notification of the incident and on becoming aware of very similar incidents in the UK, it was recognised that the practice may not be isolated and there may be similar practices in other DHBs. The NSU judged this risk to be high.
<i>Capacity and increased cost issues for DHB recall processes</i>	There are significant capacity issues associated with DHB recall programmes.

Table 2: **Serious incident code rating**

Date of Event	March 2009 – November 2012
Date of notification to Ministry of Health	20 July 2012
Date investigation commenced	July 2012
Severity Assessment Code (SAC) Score	SAC 2 Consequence = Moderate due to potential undetected permanent congenital hearing loss in babies not screened according to protocol Likelihood = Almost certain, will probably occur at least once within the next 4-12 months.

Sequence of events and incident response

Incident detection
<ul style="list-style-type: none">• MOH notified of this event by ADHB then HVDHB
Incident response
<ul style="list-style-type: none">• Commencement of serious incident review• Support for ADHB & HVDHB regarding rescreening protocol• Informing other UNHSEIP co-ordinators of the event• Request for hearing screening data audit from each DHB• Technical Expert Panel and Incident Review Group set up• Screeners identified in four more DHBs• DHB screening recall process• Additional risk mitigation steps

Note: Refer Appendix 1 for full timeline of events.

Incident detection

The Ministry of Health was first notified of this event by Auckland District Health Board (ADHB) on 20 July 2012. In June 2012 the ADHB lead screener had been alerted to a possible issue when parents of a baby she was about to screen stated that the baby had already been screened, however this was not recorded. This aroused her concerns. A detailed analysis of the screener's prior screens was undertaken by the lead screener and lead audiologist, revealing unusual patterns such as a short or long time between left and right ear screens and an unusually low, and reducing, rate of referral from the first to second stage of screening (AOAE to AABR). An analysis of data of the ear's response to each frequency tested confirmed that in some screening sessions one ear of the baby had been screened twice and in others the frequency print matched the screener's own ear.

This investigation matched an account of two similar incidents in UK National Health Service Newborn Hearing Screening Programme (NHSP) in 2011, outlined in a brief internally published incident bulletin (January 2012) accessed by the ADHB lead screener (further information on this incident is provided on page 27).

At Hutt Valley DHB (HVDHB), following a discussion with ADHB in July 2012, data reviewed by the audiologist /co-ordinator and lead screener for a monthly meeting indicated that one screener may not be adhering to protocol. Detailed analysis of the individual data downloads for a screener led to confirmation of a similar practice as used by the ADHB screener. An additional indicator of calibration level of the screen was noted (see below).

Prior to this incident, screening co-ordinators routinely undertook monitoring of screening data as required by the UNHSEIP National Policy and Quality Standards (NPQS), for example checking that a result is obtained for both ears and the appropriate screening test was used, but markers for screening of the screener's own ear in place of the baby's ear/s were not reviewed as it was not anticipated that this issue would occur.

NSU incident response

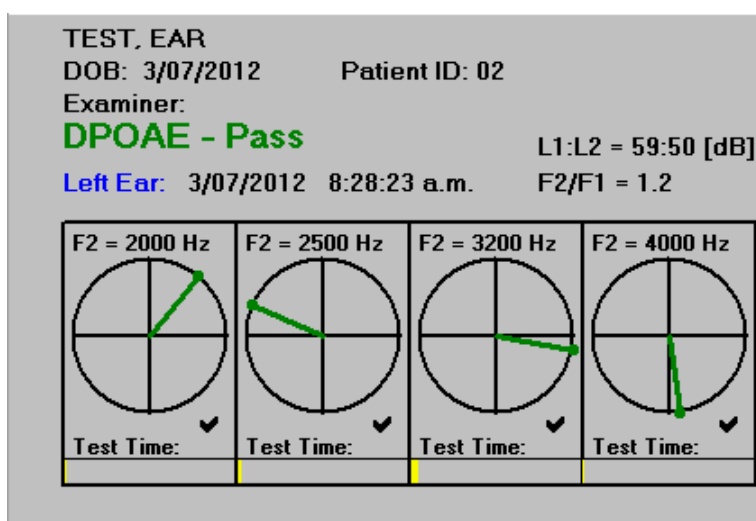
The NSU's response was to support ADHB and HVDHB in their development of a re-screening protocol and to establish whether there was non-protocol screening in other DHBs.

In August 2012 the NSU teleconferenced with UNHSEIP co-ordinators and service managers in all DHBs notifying them of the event. The NSU requested an in-depth analysis of data downloaded from screening equipment against specific markers for use of an adult ear for each of their screeners, for the past six month period. An audit tool for this analysis was developed by the NSU in consultation with the audiologists and lead screeners from Auckland and Hutt Valley (refer Appendix 2).

The four key indicators in the audit tool were:

- AOA/E/AABR screening referral rate – this should be within an expected range (8-20%). The rate would be expected to drop with regular inappropriate passing of the AOA/E screen
- timing between left and right ear – regular appearance of unusually short (<1 minute) or long intervals is an indicator for further analysis
- calibration level – this is a measure of how much sound pressure is required to achieve a critical stimulus level for different sized ear canals. Calibration level values are usually able to be viewed when screening equipment software is transported into Excel files. Advice from audiologists is that calibration values for newborn babies should be between 20 and 30, whereas for a typical adult ear are usually under 20
- DPOAE frequency print – DPOAEs are an objective indicator of normally functioning cochlear outer hair cells. They are recorded graphically as frequency prints (see Figure 1) and provide a pattern for each person's ear in response to each of the four tone pairs presented. The screener's own ear is tested as standard daily checking of the screening equipment; whereas for babies DPOAE frequency prints are generated through the hearing screening. These frequency prints can be compared to look for similarities. Similarities in frequency prints (between baby-screener or between baby left-baby right ear) can indicate that the test was performed on the same ear.

Figure 1: DPOAE frequency print (screener ear)



While isolated results outside the expected range of these indicators are usually able to be explained and are not of concern, systematic patterns of anomalous results suggest that the screener is not adhering to protocol.

Analysis of the data in DHBs was supported where required by audiologists, the NSU, members of a Technical Expert Panel (refer page 16) and UNHSEIP co-ordinators familiar with the analysis.

All DHBs were asked to complete a template summarising their findings for each individual screener and submit this to the NSU (refer Appendix 2, page 56).

Data audit outcome

The data audit has to date led to identification of a further six screeners in addition to the ADHB and HVDHB screeners who have been using results from screening their own ears when screening babies.

Due to the immediate risk of further babies not being screened according to protocol, as soon as the results were conclusive, these screeners were approached to discuss their screening practice. In some cases the screener resigned before the meeting to discuss. In five other cases, awareness of the audit activity together with co-ordinators passing on key messages for screeners from the NSU (below) was followed by admissions from the screeners.

Key messages for screeners - sent by NSU to DHBs 29 August 2012

.. we believe it is important to emphasise to screeners the importance of ensuring quality and safety in their work as well as the fact that their individual screener data will be routinely monitored. Below are some points to support you in your communications with screeners.

- The screener has a critical role in ensuring the quality and the safety of the newborn hearing screening programme. Each screener has a responsibility to ensure that programme protocol is followed for each and every baby.
- The Ministry of Health has been notified of some instances where correct protocol has not been followed in screening babies. As a result of this, some families are being offered a hearing re-screen for their babies. This is to ensure any babies with hearing loss are identified appropriately.
- The NSU has recently requested a review of individual screener data.
- The NSU is implementing additional quality control steps to prevent recurrences, including more detailed requirements for routine monitoring of individual screener data.

Five DHBs with identified screeners undertook a further, detailed analysis of their hearing screening downloads for that screener, checking the accuracy of screening for each baby the screener in question had screened. They also completed the analysis of six months of data for all

other screeners employed by the DHB. The sixth DHB is in the process of undertaking the detailed analysis.

Technical Expert Panel

In order to ensure a robust process for analysing the screening data downloads, the NSU set up a 'Technical Expert Panel' to independently review the data download results submitted by DHBs.

Functions

The functions of the panel were to:

- review the 20 DHB summary data reports and other individual screener data provided to the NSU in response to the data review request
- provide advice to the Incident Review Group as to whether, in the members' professional opinions:
 - any anomalies in individual screener data represent a systematic deviation from UNHSEIP screening protocols
 - the data indicates minor or no variance from programme protocols
 - additional data is required.

To fulfil its function the group was made up of individuals familiar with the principles of screening and quality management and able to 'confidently and expertly' appraise the screening performance indicators (ie, screening referral rates, timing checks, calibration checks and frequency prints) to analyse the likelihood that non-protocol screening has occurred.

Table 3: **Composition of the Technical Expert Panel**

Name	Expertise
Dr Michael Hale (Chair)	Public Health Medicine Specialist, NSU
Dr Andrea Kelly	Audiologist, ADHB
Jenny Woodward	Lead Screener, ADHB
Dr Harold Neal	Principal Technical Specialist, NSU
Moira McLeod	Programme Leader, Newborn Hearing Screening, NSU

Findings of the Technical Expert Panel

- The Technical Expert Panel confirmed the findings of the six DHBs that had identified systematic non-protocol screening.
- Many DHBs were not recording the screener information in appropriate ways for routine auditing. These practices were described and plans for correction agreed with the DHBs.
- DHBs will require support to establish good practices for the on-going monitoring (storage, analysis and reporting) of individual screener performance.

- One of the key quality checks, the calibration level test, is not possible on the newest model of the Accuscreen machine.
- It is possible that screeners were not recording screening sessions that were incomplete (e.g. due to an unsettled baby), making the overall refer rate lower than would be expected.
- The review exercise has led to better understanding of the best methods of screening data review and of the relative merits of each of the performance indicators.
- The review of some DHBs' data continues as more detailed analysis has been indicated from the experience gained.

DHB screening recall process

The first two DHBs to identify screeners not adhering to protocol— ADHB and HVDHB — offered re-screening for all babies screened by this screener since they began employment. A decision was made in subsequent DHBs to identify issues — CDHB, Lakes DHB, BOPDHB and WDHB — to offer re-screening only to those babies identified as not screened according to protocol. This decision was made in consultation with the NSU and was based on learned experience in regard to the incident, which included the following:

- experience in analysing the data that has led to confidence in identifying which babies have been incorrectly screened, confirmed by scatterplots of when the practice started
- discussions with personnel from the UK newborn hearing screening programme (NHSP) about their management of a similar incident where the protocol was to recall only babies identified as incorrectly screened
- DHB screening capacity.

The recall process is outlined in a flow chart in Appendix 3. Recall letters were sent to parents and general practitioners. A sample letter is provided in Appendix 4.

Depending on the capacity of the DHB, the re-screening protocol has been either to:

- use two screeners to re-screen with referral to audiology where the child is not able to be easily screened (ADHB) or
- have audiologists perform the screening of babies over three months (HVDHB, BOPBOP, Lakes DHB, CDHB).

The outcome of the recall process in Table 4 overleaf.

Table 4: **Status of DHB screening recall as at 28 November**

DHB	Babies incorrectly screened	Number babies recalled to date	Babies rescreened	Babies referred to audiology [#]	Babies seen at audiology	Families who have declined re-screening [±]
Auckland	431	1263	276*	97	77	203
Hutt Valley	176	939	405*	148	64	74
Canterbury	517	418	107	40	No data available yet	29
Lakes	378	264	52	20	2	19
Bay of Plenty	542	538	26	13	No data available yet	-
Waitemata	20	To be commenced				
Total	2064	3422	901	318 [#]	143	349

* All babies screened by identified screener recalled.

[#] The majority of referrals to audiology were due to babies being unsettled for the screening test.

[±] Refers to families who have actively declined and/or not attended an appointment twice. Does not include those who have not responded to recall (refer flow chart in Appendix 3).

On 8 November 2012 the NSU was notified of a 10 month old re-screened baby diagnosed with a hearing loss that should have been detected at screening. The baby was identified as one for whom the screener had screened both of her own ears. The hearing loss is bilateral and classified as a severe to profound sensorineural loss. Clinical advice regarding the delayed diagnosis is that the age of the child at diagnosis is still early and any impact on the social, language and other development of the child would be small. The baby is to have a cochlear implant at 12 months old.

Some children have been diagnosed with conductive hearing loss which is most likely to be otitis media with effusion and these babies are being followed up through the DHB audiology service.

Additional risk mitigation steps by the NSU in response to the incident

Concurrent with the data analysis request, NSU activities in response to notification of the incident included the following.

1. Regular teleconferences and other communications with the DHBs involved in order to provide support, advice, and review of plans for recall.
2. Development of Standard Operating Procedures to support DHBs where a screener issue is identified. These covered notification, identification of babies, the recommended re-screening process, data management and communication requirements.
3. A communication plan – the main messages included the fact that re-screening would be offered due to ‘a problem with one part of the screening process’ and the low risk to individual babies of a missed hearing loss.
4. Workshops were held in October 2012 for DHB UNHSEIP co-ordinators, service managers, and audiologists. These covered co-ordinator responsibilities for quality, audit and operational management of newborn hearing screening; strengthening relationships with charge audiologists; updates on the purpose and principles of the programme; screener competency requirements and a practical session on data download monitoring. Themes and good practices emerging from compliance audits were also discussed. Feedback from these workshops was very positive.
5. Visits to eight DHBs, meeting with senior management personnel to discuss the incident and the governance of screening programmes in DHBs.
6. A plan for a Serious Incident Review.

Section 2: Incident review

The Ministry's review of the hearing screening incidents in six DHBs focused on understanding the underlying factors in the screening programme structure that may have contributed to failure to adhere to the UNHSEIP screening protocols. The aim of the review has been to identify changes to systems within the UNHSEIP that will strengthen quality assurance of newborn hearing screening and reduce the likelihood of screeners not following protocol.

Methodology

The review occurred in four phases.

Phase 1: *DHB data analysis and review set-up* Establishment of review group and review of data analyses submitted by 20 DHBs.

Phase 2: *Information gathering* Collection of facts around the separate events at the six DHBs, any international literature and evidence of similar events, and qualitative data to inform the contributory factor analysis.

Phase 3: *Causal/contributory factor analysis* Review of the information by the Incident Review Group in order to investigate why the incidents happened and what measures could reduce recurrences. As the incident involved knowing deviation from established protocols, a strict root cause analysis methodology was not recommended, however elements of a root cause methodology were included in this phase.

Phase 4: *Determining of recommendations* Review of findings from phase 3 and agreement on the recommendations for DHBs and the NSU.

Review structure

The investigation was conducted by an NSU operational team supported and advised by experts from a range of disciplines.

An operational group of NSU staff managed support for DHBs, reporting requirements, review of the incident and initial strengthening initiatives within the programme.

An Incident Review Group was established to guide the review and make recommendations on corrective and preventive actions for the UNHSEIP.

Advice was also obtained from the Health Quality and Safety Commission in development of the review plan and draft report, and from the Ministry of Health's legal team.

Incident Review Group

Table 5: Composition of the Incident Review Group

Name	Expertise
Andrew Keenan (Chair)	Quality and Safety, ADHB
Dr Pat Tuohy	Chief Adviser, Child and Youth Health, MOH
Jane McEntee	Group Manager, NSU
Dr Michael Hale	Public Health Medicine Specialist, NSU
Dr Andrea Kelly	Audiologist, ADHB
Jenny Woodward	Lead Screener, ADHB
Mary Bird	UNHSEIP Co-ordinator, Taranaki DHB
Moira McLeod	Programme Leader Newborn Hearing Screening, NSU

Terms of reference of the group were as follows.

1. To review and discuss the advice provided by the Technical Expert Panel on the DHB data downloads investigation, including issues arising from the analysis.
2. To identify risks to the UNHSEIP and advise on mitigation strategies.
3. To advise on the need, focus, priority and scope of further action or follow-up required.
4. To advise on multidisciplinary issues including potential process changes, quality assurance activities, training needs and how they may be implemented.
5. To identify and recommend evidence based changes to relevant parts of the National Policy and Quality Standards.
6. To advise, review and provide feedback on the incident investigation.
7. To review and provide feedback on the draft incident report, including recommendations for any changes to the UNHSEIP.

Information review

Information was gathered from a range of sources to inform the review.

- *A review of international literature and grey literature for similar events* The following databases were searched (2005-present) for relevant articles on false negatives and newborn hearing screening: ScienceDirect, Pubmed, Google Scholar and Medline.
- *Incident reports from affected DHBs* The NSU requested reports from the DHBs with screening incidents including an analysis of potential causal and contributory factors to the incident, including any information proffered by the screeners about their actions.
- *In-depth interviews with other screeners* In September 2012 the NSU carried out interviews with eleven newborn screeners across four DHBs.
- *A survey of the newborn hearing screener workforce* In October 2012 an online survey was sent to all newborn hearing screeners in order to gain a better understanding of their role.
- *Site visits to DHBs* During September and October 2012, Jane McEntee, Group Manager National Screening Unit and Jill Lane, Director National Services Purchasing, National Health Board, visited eight DHBs to discuss the UNHSEIP including four of the DHBs with screener incidents: ADHB, HVDHB, BOPDHB and Lakes DHB. The primary purpose of these visits was

to discuss how newborn hearing screening is managed within the DHB and to note strengths and potential gaps in the service.

- *A contributory factor analysis* This was conducted by the members of the Incident Review Group who collectively have a wide knowledge and experience in the UNHSEIP.

Background – the UNHSEIP

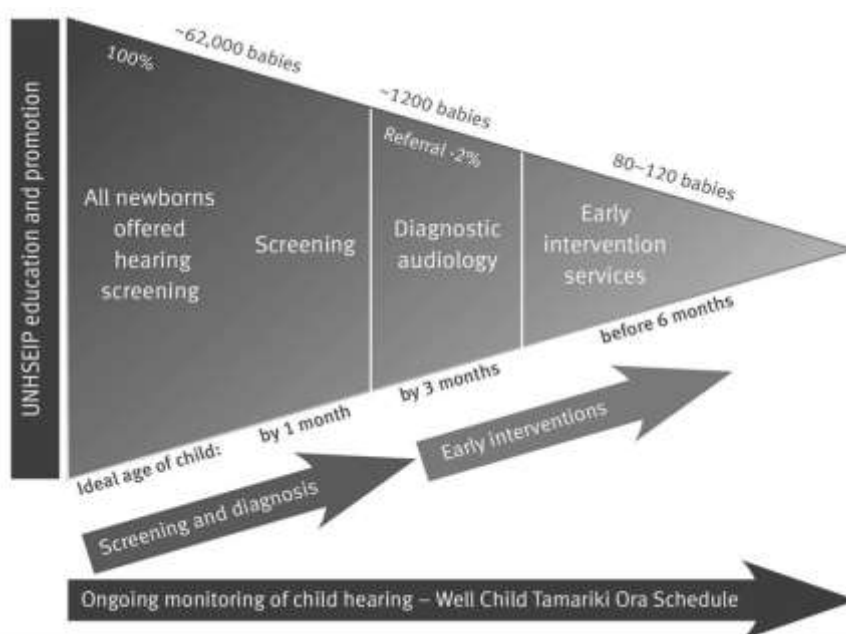
Programme aim and goals

The UNHSEIP aims to facilitate early identification of moderate or more severe congenital hearing loss so that babies can access timely and appropriate intervention to support the development of speech and language. The core goals are:

- 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, audiological and early intervention education services by 6 months of age.

Less than 2% of babies do not have a clear response on screening and are referred for audiological assessment.

Figure 2: Overview of the UNHSEIP screening pathway



Newborn hearing screening test

The UNHSEIP has two main screening protocols depending on whether the baby has been in a neonatal special care unit. For well babies within the UNHSEIP, automated otoacoustic emissions (AOAE) testing is used. Where a clear response is not obtained using AOAE testing, the screener moves on immediately to automated auditory brainstem response (AABR) testing (refer Glossary for definitions and Appendix 7 for the Well Baby Screening Protocol). Both tests produce immediate results (either 'pass' or 'refer') and can be carried out while the baby is asleep.

When performing an AABR with Accuscreen equipment, significantly more set-up time is involved than for an AOAE test. Both tests require a quiet environment and a settled baby.

Newborn hearing screeners

There are approximately 108 newborn hearing screeners employed in New Zealand. This was a new workforce trained to meet the needs of the UNHSEIP. Their role spans: identifying and obtaining informed consent for babies to be screened, screening babies according to UNHSEIP protocols, communicating results to parents/guardians, referring babies to audiology if required, and collecting and managing screening data.

No prior qualifications or experience is specified by the UNHSEIP for new screeners. All initial screeners for the UNHSEIP received a two week training course run by the University of Canterbury, which included a theoretical and practical component. All were individually assessed by the University of Canterbury trainers before they began screening. These screeners are now eligible to complete a level 3 New Zealand Qualifications Association (NZQA) newborn hearing screening qualification through a 'recognition of current competency' process. Thirty screeners have completed the qualification. Since 2010, all new screeners have been given on-the-job training by approved senior DHB screener trainers. This training process follows a similar format to the University of Canterbury course and the final practical assessment of the screener forms a component the NZQA newborn hearing screening qualification. DHB trained screeners are all expected to complete the other components of the NZQA newborn hearing screening qualification within a year.

Screener numbers vary from 1-10 screeners depending on the size of the DHB. Some DHBs may have one or more screeners working in isolation in remote regions, making oversight challenging. There are no minimum requirements for the number of cases per screener to maintain competency.

The salary range for newborn hearing screeners is \$36-\$50,000 pa. Co-ordinators and screeners report inconsistency in rates between DHBs. Most screeners are part time. As newborn hearing screening is a new profession in New Zealand, screeners are not yet represented by a professional body.

The UNHSEIP co-ordinator role

All 20 DHBs have an individual appointed to provide co-ordination of UNHSEIP services. The co-ordinator's role is not defined and there is variable interpretation of and time allocated to the role across DHBs. Small DHBs may only have a 0.2 FTE appointment to UNHSEIP co-ordination. In some DHBs UNHSEIP co-ordinators are screeners, other DHBs use service managers or charge audiologists to perform co-ordination functions or combine the role with co-ordination of other programmes or management roles. Placement of the role and reporting lines vary between DHBs — some report to the Maternity Services Manager, some to Allied Health Managers. No formal UNHSEIP training is given to co-ordinators. Clinical, operational and technical experience of co-ordinators varies across DHBs. Themes emerging from the first eight DHB service compliance audits, which are part of the UNHSEIP's overall quality assurance programme, indicate that the co-ordinator role is weak or absent in some DHBs.

DHB service delivery models

DHBs are contracted by the Ministry of Health to provide newborn hearing screening, programme management and co-ordination services. Audiology services for the programme are not part of this

service agreement and are provided as part of the Crown Funding Agreements with DHBs. There is no specific allocation of FTE to audiologists for UNHSEIP work.

The newborn hearing screen is usually undertaken in maternity units. Screeners are encouraged to complete screening for as many babies as possible before discharge from the hospital. Where a baby has been discharged unscreened or where the screen is incomplete, an appointment is made for screening at an outpatient clinic.

Three DHBs were independently implementing newborn hearing screening for some years before it became a national programme. All six DHBs with identified screener issues began their UNHSEIP programmes between 2009 and 2010.

There is a range of management frameworks within which newborn hearing screening is provided in DHBs. At ADHB and HVDHB it is managed through audiology (though physically based near maternity) whereas at Lakes DHB it is managed through the population health unit. Understanding of the programme, clinical leadership, and involvement of management beyond the service provision level is highly variable. Most of the six DHBs with identified screener issues have been strongly engaged in the programme, with quality plans and processes in place. Two of the DHBs have strong audiology and screener leadership for the programme, with lead audiologists recognised as having particular expertise in paediatric diagnostics and closely involved in monitoring of individual screener and programme statistics.

The database capabilities for newborn hearing screening vary widely among DHBs. At ADHB newborn hearing screening data is managed electronically through the licensed audiology programme *Ajexus*, whereas at HVDHB it is incorporated into the hospital patient management system. Both systems facilitate high quality tracking of babies and monitoring. It is likely that strong databases led to the screener issues being identified earlier in these DHBs. In national monitoring all six DHBs had demonstrated high screening coverage and timely audiological assessment.

Programme quality assurance

All DHB UNHSEIP services must comply with the UNHSEIP National Policy and Quality Standards (NPQS), which include the screening protocol and procedures, internal quality assurance activities, and general screening and audiology competency requirements. Routine external compliance audits of DHBs against the NPQS and UNHSEIP contractual requirements commenced in May 2012. Eight DHBs have been audited to date. Following initial identification of this incident, audit processes were amended to include a limited random audit of data downloads using the new indicators for non-protocol screening. Preliminary concerns regarding a BOPDHB screener were identified at audit on 30-31 August 2012.

Programme monitoring

The NSU collects high level screening and audiology data from DHBs for monitoring performance of DHBs and the programme against a set of national indicators. The most recent draft UNHSEIP monitoring report, October – March 2012, shows:

- 93% of families of babies born in these six months were offered newborn hearing screening
- approximately 87% of babies born completed newborn hearing screening

- a high proportion (93%) of these babies completed screening by the target of one month of age
- a referral rate to audiology of 1.5%
- for this six months 30 babies (12% of those that completed an audiology assessment) were identified with a permanent congenital hearing loss. A greater number (71) were identified with a conductive hearing loss (note limitations due to gaps in audiology data received by the NSU).

Current quality improvement initiatives in UNHSEIP

1. The NSU is to release revised UNHSEIP National Policy and Quality Standards early in 2013. These include:
 - new requirements for screener trainers
 - requirements for routine detailed monitoring of screening data downloads
 - a formal standardised procedure for annual monitoring of screener competency (the Newborn Hearing Screener Competency Framework).

DHBs will be required to report quarterly on these activities to the NSU.
2. A visual guide for co-ordinator monitoring of screening data downloads is in development.
3. Screener training and on-going development is being reviewed for areas where the ethics, motivation and awareness of the importance of the screener role can be strengthened. Video-clips reinforcing such messages are being produced which will be incorporated into the online competency assessment.
4. The NSU is working with DHBs on following up of recommendations arising from DHB service compliance audits.
5. Workshops for screeners are to be held as part of the 7th Australasian Newborn Hearing Screening Conference in Auckland in May 2013.

Review findings

Literature review

A range of risks arising from poor quality newborn hearing screening have been identified in overseas newborn hearing screening programmes. The most serious of the effects include late diagnosis and missed cases of hearing loss. The following quality issues have been identified as associated with the screeners' role³:

- poor processes for securing informed consent
- poor infection control (e.g. not cleaning hands or ear tips)
- poor screening techniques
- the tendency for some screeners to over-screen babies (completing too many screens in an effort to get a pass)
- choosing the wrong time /environment
- lack of familiarity and confidence with the equipment
- poor data quality and incomplete record keeping leading to ineffective programme monitoring and difficulties identifying and addressing quality issues
- poor communication with parents, leading to:
 - high parental anxiety through misinformation or poor framing of the results of screening
 - high loss to follow-up resulting from over-management of parental anxiety (reducing the parents' anxiety about a referral to the point where they do not bring their child back for further appointments)
- low screening coverage (e.g. poor decline rates) and/or high loss to follow-up
- high false positive rates.

A literature search yielded no evidence of published articles on newborn hearing screeners generating screening results using their own ear or similar events leading to potential screening false negatives.

A very similar issue, however, was reported in a UK NHS Newborn Hearing Screening Programme Incident Bulletin (January 2012)⁴. The bulletin referred to the screener entering clear response results for ears that have not been tested. This issue had arisen in two different UK newborn hearing screening programmes during 2011. Two scenarios outlined were:

- repeating the test in the baby's same ear and recording a clear response in both ears
- after a clear response in the baby's first ear, carrying out a test in their own ear and recording it as a result for the other ear of the baby.

³ Digby J. 2010. *Assuring the quality of audiology and screening services within the Universal Newborn Hearing Screening and Early Intervention Programme* Paper commissioned for the National Screening Unit, Ministry of Health.

⁴ National Health Service. January 2012. NHS Newborn Hearing Screening Programme Incident Bulletin, Number1. www.hearing.screening.nhs.uk Accessed August 2012.

In each case these incidents were detected by the programme managers who identified changes in the performance and referral rates for the screener concerned, that is:

- low level of referrals to audiology for babies screened by this screener
- short intervals between testing one ear and then the next.

Recommendations were made to managers to ensure routine monitoring of screener performance and monthly checks of screener performance are carried out as per the programme manual.

Subsequent communication between the NSU and NHSP to discuss the similar incidents included:

- a teleconference (3 September 2012) and later conversations (October 2012) between Ministry staff and the NHS Deputy Director for the Newborn Hearing Screening Programme (NHSP)
- documented reflections on the incident provided to the NSU by the NHSP Training Leader (September, 2012).

A national audit of individual screener data comparable to that in the UNHSEIP was not undertaken in the NHSP. Re-screening was offered only to those babies where there was clear evidence of incorrect screening. The NHSP were open about the incident to screeners. Most screeners were reportedly shocked this could occur but also surprised to realise it could be identified. 'Red flags' identified in screener behaviour included working on their own, not working as part of a team or downloading data when others have left, and were similar to some noted in the New Zealand incident.

The UK investigation found that the incident related to challenges in the role of the screener, such as communicating uncertain messages to parents. A common factor was stress in screeners' personal lives that affected their willingness to do AABRs and possibly be the bearer of potential bad news. Findings included the need to regularly reinforce the importance of the screeners' role in the success of the programme, hold monthly screener quality meetings, and ensure a strong link between the screening and audiology teams.

The further screeners are from appreciating the value of the programme and the impact it can have on a family and child's life, the more the role becomes routine and screeners may begin to take shortcuts.

It is important that midwives see themselves as partners in the newborn hearing screening programme, and value and understand the aims and importance to families.
(NHSP Head of Training)

Recommendations from the NHSP included:

- monthly team meetings
- more checks and balances across the programme so screeners are properly supported and any stressors do not translate into performance issues
- regular refresher training – aims, incidents and consequences as well as communication and clinical skills
- feedback regarding true cases
- sharing of local and national programme performance statistics

- feedback on parent experiences, e.g. via videos, as a powerful tool for reflective discussions and reinforcing programme aims
- audits.

A recent personal communication has also identified a presentation given by the NHSP Head of Training at a newborn hearing screening conference in 2010 which made reference to ‘screening of own ears’⁵.

Features of the UK NHSP

Thirty out of 110 primary care trusts run a community model of newborn hearing screening, with newborn hearing screening provided by health visitors (nurse/midwives with post graduate qualifications who are responsible for under five year olds).

NHSP local managers are responsible for the local management of the programme. The programme has a national team of 12 training and development specialists who provide each local programme manager with two day face to face training at the time of appointment and on-going mentoring. The local manager also must train as a screener. The local managers are all required to attend an annual workshop. At the workshops an open culture is encouraged by use of ‘case studies’ where things have gone wrong. One example was of a screener screening her own ears and getting the group to discuss some of the reasons why this might occur.

Screeners are seen as pivotal to the quality of the programme. Quality assessment of screeners is provided through training and development and a screener performance report produced by the local manager. The screeners are observed each year as part of an on-going assessment. The programme has been running a specific training module for all screeners, local managers and audiologists on ‘sharing the news; supporting and empowering families through effective communication’.

Integration of screening with the midwifery team is emphasised.

⁵ Kim, L. June 2010. *How good are your screeners?* NHS Newborn Hearing Screening Programme conference presentation, Beyond Newborn Hearing Screening: Infant and Childhood Hearing in Science and Clinical Practice, Cernobbio.

Information from DHB incident reports

Information about the screeners concerned

Information reported about the screeners – their backgrounds, performance, stressors and explanations for incorrectly performing the screening test – has been collated and presented in summary form in order to protect privacy.

Experience as a newborn hearing screener

Most of the screeners concerned were ‘experienced’ screeners with relatively long involvement in the programme. The screeners commenced their roles between early 2009 to late 2010. One began non-protocol screening seven months after commencing employment and another three months into the role.

Prior qualifications and experience

Prior qualifications and experience of the screeners varied ranging from stay-at-home mother, no formal tertiary qualifications, to some background or training in health related roles such as health care assistant or partial health professional training.

Screener training

The screeners were trained by either of the two training programmes: the earlier University of Canterbury training programme or the DHB based ‘train the trainer’ model. At least two had completed the new NZQA level 3 qualification in newborn hearing screening and another was enrolling in the qualification at the time of the incident.

Performance and areas of responsibility

Prior to identification of incorrect screening, all of the screeners were reported to be competent and confident at their job. All reportedly had yearly or more frequent competency assessments via direct observation of screening practice, and no competency issues were identified. It is worth noting that the majority had been in positions where they had some additional responsibility within their newborn hearing screening team. Two had been selected to be trainers of hearing screeners.

Human factors: physical, mental, emotional state

A range of physical and emotional stressors in home life of some screeners were noted. Support services had been appropriately offered by the DHBs concerned. In DHBs where more than one screener was involved, the co-ordinator reported that screeners appeared motivated at all times and seemed diligent in ensuring all babies were screened. The screeners had not taken stress leave or complained about aspects of the job. At least one DHB noted that there were no patterns to days, inpatient or outpatient visits or time of day when the anomalies occurred.

Environmental and equipment factors

One screener occasionally expressed annoyance at level of accuracy required in paperwork and some dislike for new sensors for AABR.

Remuneration and workload

There was no indication that the screeners in question were particularly unhappy with their career path and remuneration. At least two of the screeners were on the highest pay level in recognition of their experience and responsibilities.

One DHB commented that the screeners had a reasonable workload (1.2 FTE to 1600 babies, with the coordinator also available to screen if needed) and had adequate time and opportunities to screen babies.

Screener explanations

The DHBs were unable to interview most of the screeners concerned about their screening practices. Nevertheless, explanations for not adhering to screening protocol were provided to coordinators by four of the screeners. Reasons given (as reported by the coordinator) were:

- not wanting to put families through the trouble of going through an AABR or follow-up appointment (ie, making a 'clinical decision' based on the screening equipment response that the baby would have passed once the fluid cleared)
- stress, external pressures and being over committed in their personal life
- finding the job more difficult than they had expected (settling babies)
- competing priorities in their personal life and 'laziness'.

Two of screeners were provided with data and information highlighting their screening practices but continued to deny non-protocol screening.

Other potential contributory factors

Education and training

More than one DHB commented that training on ethical responsibility is not adequately covered in screener training modules.

One DHB commented that audiologists who oversee the programme have had limited training in how to support the UNHSEIP. It was thought to be unrealistic to expect each DHB's audiology service to be fully conversant with the UNHSEIP, the auditing and equipment requirements, especially given high audiology staff turnover. On-going, direct advice/support from a lead audiologist for the programme and a minimum of an annual meeting was recommended.

Team factors

While screeners are reportedly an integral part of the maternity teams in most DHBs, other staff in the maternity unit are not familiar with screening process or protocol. Some DHBs commented on screeners working independently in smaller DHBs with no opportunity for peer review, and noted that a co-ordinator may be based in another site, allowing limited oversight and monitoring.

Environmental and equipment factors

One DHB commented on the considerable time difference in performing an AOAE versus an AABR test. It can take a long time to obtain an AABR result, particularly a refer result. This may increase parental anxiety and create a stressful environment for the screening to take place, which may add to the reluctance of the screener to complete an AABR. There is also awareness that the equipment required for AABR (ie, ear cups) is more expensive⁶.

Task and process factors

Some DHBs commented on the daily equipment check requirement for the screener to perform a positive ear test on her own ear. It was felt that knowing she could obtain a pass result easily in her own ear may have 'planted the seed' for a method of incorrect screening.

Several DHBs mentioned rapid postnatal discharges and/or high rates of DNAs in outpatient clinics putting pressure on screeners to complete screening quickly. In these circumstances parents can become impatient if the screening is taking longer than expected.

More than one DHB noted that the screeners had ready access to support and guidance. In more difficult cases screeners were regularly given alternatives, including direct referral to audiology. Policies and procedures are kept up-to-date and easily accessible.

Lack of a national audit tool

Several DHBs commented on the lack of a comprehensive national audit tool for monitoring data downloads at the initiation of the programme. This was developed when evidence of own ear screening emerged. They felt there was a lack of formal training for auditing of downloads for coordinators at the establishment of the programme.

Some DHBs commented on absence of awareness by screeners that individual data and quality of the programme is being monitored.

Lack of a national database

It was felt that a 'proper' national database would form an integral part of the quality framework of the programme. The ability to directly download into a national database would make the analysis and recall process less labour intensive, reduce the risk of results being changed, improve accuracy of the information collected, and allow a national body to monitor the entire programme.

Lack of funding

Some DHBs commented that in their view the funding for the service is insufficient to provide a DHB newborn hearing screening service to the quality standard required. It was noted that manual auditing is time consuming.

⁶ Note that while this is the case for AABRs performed in most DHBs, for the AABR screening equipment in used in both Auckland and Canterbury DHBs there is no difference in time and no cost in consumables.

One DHB considered that there were no identifiable systems factors within the DHB associated with the incident. Another commented on a perceived lack of assessment of all potential risks undertaken nationally.

Screener interviews and survey – research synthesis

The following section provides a synthesis of two research initiatives undertaken by the NSU in October - November 2012 in response to the incident: qualitative interviews with screeners across four DHBs and a national online survey of screeners (response rate 60%). The full analysis of both research initiatives is provided in Appendices 5 and 6.

Both initiatives demonstrated that screeners faced similar issues. The key findings were as follows.

Working as a screener

- A significant proportion of screeners felt that their role was important (68% strongly agreed and 28% agreed), and most described their job as interesting (79%), caring (74%) and rewarding (71%).
- Some screeners did not expect their role to be so intense and busy, or to require such a degree of responsibility. For example, gaining trust from parents is something that they were surprised they would need to do.
- Half of the screeners were employed in the health sector prior to becoming a newborn hearing screener. The remainder were employed in administrative, education and retail roles.

Sources of stress

- Screeners described their role as being busy, pressured and lonely (especially when short staffed).
- 42% of screeners identified the role as stressful. The most common sources of stress were the pressure to screen lots of babies (44%), cramped working conditions (43%), pay and employment conditions (32%), and conveying referral to audiology results to parents (25%).

Satisfaction with their work

- 73% of screeners were very satisfied /satisfied with their jobs. Most screeners enjoyed the meaningful nature of their role. Other areas of satisfaction were around interacting with parents, and being part of a good work environment, which includes the social aspect of their role.

Dissatisfaction with their work

- Although only 6% of screeners were dissatisfied with their work, most screeners identified areas of dissatisfaction. The main area was around workload, work conditions and pay rates. They also felt that their role was not valued by other health professionals, especially midwives. They were unhappy about conditions such as working in small cramped offices and having to perform screening in noisy rooms, which made it difficult for them to screen babies accurately. For some, this indicated a lack of appreciation of their role.
- Lack of development opportunities to further extend and develop their skills was expressed by many screeners. Although two-thirds received feedback on their work performance, around 17% received no feedback on their how they were doing on the job. Screeners felt frustrated with the lack of communication with regards to feedback on their performance.

Screening process

- There was no apparent difference in preference for either AOAEs or AABRs. However screeners did not find the new Accuscreen easy to use and thought that the ear tips were longer, which disturbed the baby.
- Screeners also found gathering information on family history frustrating and believed the protocol required from AOAE to AABR to be cumbersome.

Suggestions for improvements

- Screeners commented on the need for quieter rooms to screen in, the need for more staff, more opportunities for training, and for the pay rate to reflect the training, responsibilities and commitment. Some made comments about the need to update the information scripts for families.
- Screeners felt their role was not fully accepted as part of the maternity unit in the hospital. They commented that better links across different services and having a network of screeners that met regularly would help improve their role.

Key areas of discussion arising from DHB visits

September/October 2012

DHB organisation and management

- Visibility of, and accountability for, newborn hearing screening at higher levels in the DHB organisation is low. Awareness of the service tends to be by exception, when there is an issue.
- Involvement at clinical governance level is important, for example newborn hearing screening may be included within clinical governance of maternity, paediatric, and ENT services.
- There is a general lack of understanding of screening and quality requirements within DHBs. Integration of newborn hearing screening into DHB services is important.

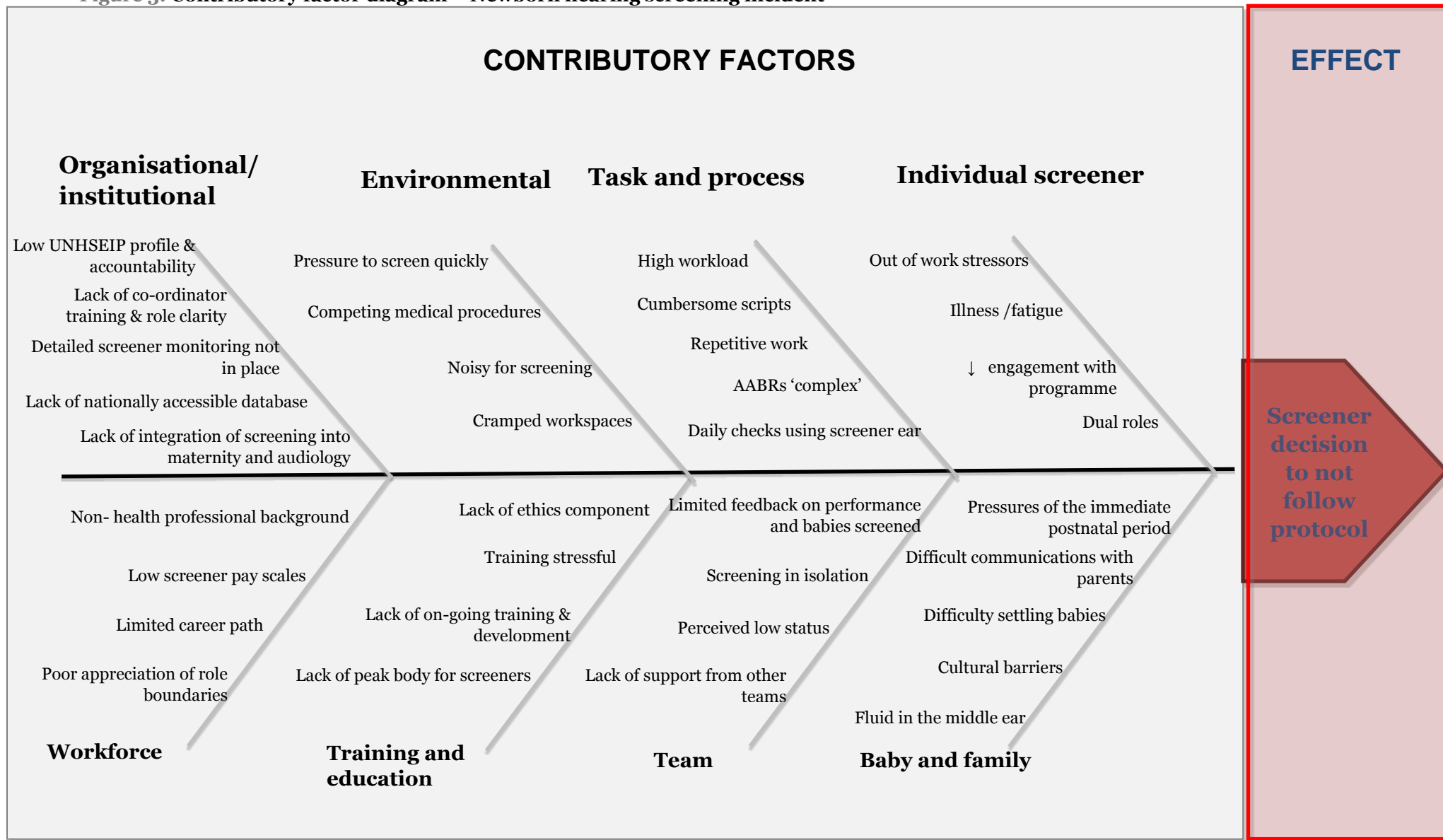
Screening programme aspects

- Involvement of audiology teams in the programme is important.
- A national centralised database for newborn hearing screening would be beneficial.
- A more collaborative approach between DHBs towards purchasing, for example equipment and consumables, would be beneficial and may lower costs.
- Changing the screening protocol to AABR only would eliminate the opportunity for own ear screening, and would potentially streamline the screening process.
- There is no national job description for UNHSEIP coordinator. The co-ordinator needs to have a good understanding of the screener role and should do the screener training.
- Ethics and the value/importance of the role of the screener should be included the screener training.

Screening workforce

- Investment in recruiting the right people as screeners is important.
- The role of screener does not require a health qualification/background and the screening test is perceived as 'easy', however screeners often work autonomously and need to be confident in dealing with difficult situations. Further training and support in this would be beneficial.
- Workload can be demanding for screeners. Early discharge of mothers and babies after birth is a challenge as early screening often has a higher rescreen rate. Encouraging families to come back for a second screening can be difficult.
- On-going education/study days for screeners are important.

Figure 3: Contributory factor diagram – Newborn hearing screening incident



Section 3: Discussion and recommendations

Population-based screening programmes are dependent on high participation rates and stringent quality standards at each step of the screening pathway, and are particularly vulnerable to failures at any one point that may compromise the programme.

While the actual harm resulting from this incident is small, across the six affected DHBs nearly 3,500 babies to date have been offered re-screening. While this represents a small proportion of the overall numbers of babies screened over the period, costs to DHBs, to families and to the NSU in terms of diversion of resources arising from the incident and potential damage to confidence in the programme have been considerable.

The course of action taken by the NSU in response to the initial two notifications, that is, to initiate an audit of all screeners, was important in maintaining the integrity of the programme. The audit tool proved to be sound in that it led to clear identification of other screeners around the country not adhering to protocol. The distribution of these screeners was unrelated to the quality of management of the programme in the DHBs concerned. Nor does there appear, to anyone's knowledge, to have been communication between the screeners concerned in regard to non-protocol practice.

It is apparent that the incident has been well managed by the DHBs. The response has been prompt, thorough, and ethical – in many cases co-ordinators have checked screens done by all staff back to the beginning of their programmes. They have made best efforts to have parents bring their children for rescreening, minimising the risk of missing hearing loss. Well managed and consistent communications have minimised undue anxiety and risks to the wider programme.

Nevertheless, the incident has highlighted components of the programme that require review and strengthening. Now that the 'implementation stage' of the programme is over, focusing on improving the quality of these aspects of the programme will help to ensure its strength as a public health programme into the future. Some of the lessons learnt will be able to be generalised to comparable hearing screening programmes internationally.

Contributory factors – lessons learnt for management of the programme

The non-adherence to basic and, as the analysis shows, clearly well-understood screening protocol is in the end a decision made by the individual. Though limited by the inability to interview the screeners concerned directly, the review found no consistent pattern of contributory individual factors that on their own could explain why screeners might choose not to follow protocol. All were reportedly competent screeners, often in positions of some additional responsibility.

As the incident involved conscious contravention of known protocols, the review has highlighted a range of contributory rather than causal factors. These were able to be categorised as follows (refer also to Figure 3, page 37):

- factors relating to the physical, mental and emotional state of the individual screener
- factors relating to the baby and family in the immediate postnatal period
- environmental factors that affect the screeners' ability to do their work
- factors relating to the screening task and the protocols
- factors concerning the screener's relationship to screening, maternity and audiology teams
- factors relating to screener training and on-going education
- factors relating to newborn hearing screeners as a workforce
- organisational and institutional factors concerning management of the programme.

These are considered below in relation to the key roles associated with the programme. Two further factors are of particular significance in the context of the incident: the AOAE/AABR screening protocol and the absence of monitoring of individual screener data/awareness of monitoring. Key changes in these areas would have an important preventative role, and it is helpful to consider each of these independently.

AOAE/AABR screening protocol

The incident could not have occurred with an AABR only screening protocol, as the nature of the AABR test makes it unsuitable for own ear testing. AABR only screening is the test of choice in many newborn hearing screening programmes internationally and was considered at the time of establishment of the programme, however the cost of AABR consumables and relative ease of AOAE at the time was influential in the decision to have the current protocol. Alternative technology is now available that negates the importance of these factors and it may be timely to reassess the programme protocol. Anecdotally, an AABR only protocol would be welcomed by many audiologists and screeners.

Recommendation for the screening protocol

1. The NSU must reassess the screening protocol with a view to changing to an AABR only protocol.

Absence of monitoring of individual screener data /awareness of monitoring

An audit tool for individual screener data analysis with relevant indicators, prompt and regular monitoring by co-ordinators, and screeners aware of such monitoring would have minimised the likelihood of this incident. In the few instances where it still occurred, incorrect screening would have been identified early enough to recall babies promptly and performance measures put in place for the screener. However given the absence of a known precedent at the time for this behaviour, an audit tool with indicators for screening adult ears was not in place. Some DHBs were not undertaking any monitoring of screener data downloads and some did not have individual screener ID entered into each item of screening equipment.

The incident has been a lesson in the importance of routine individual screener data monitoring for all involved in the programme. Monitoring of individual screener data downloads for AOAE/AABR referral rate and calibration level is a requirement in the revised NPQS due to be released early 2013. Clear checks of data downloads is also a component of the screener competency framework which will be introduced as a formal annual assessment for all screeners in 2013. It is also included in the DHB compliance audit tool.

In the interim the NSU has requested DHBs continue to use an updated version of the audit tool in Appendix 2 to carry out regular (at least monthly) monitoring of individual screener data. Awareness of being monitored is an important deterrent and screeners need to understand they are being monitored at this level of detail. This level of oversight is evidently a necessary aspect of screening team management and is not uncommon in workforces of comparable training.

The up-skilling of programme co-ordinators in data monitoring begun with this incident will need to continue.

There may be a degree of residual risk in non-adherence to other protocol scenarios that are more difficult to detect and these will need to be considered.

Recommendations for individual screener monitoring

2. The NSU must operationalise the data monitoring requirements in the updated UNHSEIP NPQS within the next three months and monitor their effectiveness. In the interim DHBs must continue to use the protocol designed for the data audit and report outcomes to the NSU.
3. The NSU must continue to provide resources and regular training to ensure programme co-ordinators are skilled in the monitoring of screening data downloads.
4. DHBs must make screeners aware they are being monitored through openness about the routine monitoring processes.
5. The NSU should lead an assessment of residual risk to the programme from screener performance.

The screener role

From the screener survey it appears that most screeners find their work meaningful, interesting, rewarding, and enjoy the interaction with families. Almost all screeners feel they do an important job. The fact that most feel their team gets on well and are comfortable asking questions about their work is indicative of supportive team environments.

While these are positive findings, it is important for this review also to look at the minority – the 6% who report being dissatisfied in the role, or the 17% who find their job to be hard.

Workload and conditions

Many sources of dissatisfaction were identified in the screener survey, the most common being workload and conditions. Many commented on not having sufficient staff, the amount of paperwork required on top of their screener role, the cramped working conditions and having to screen in noisy rooms. Some screeners said that this demonstrates a lack of appreciation of their role. Many also apparently feel that their pay rate does not value their role and job expectations. Improvements could be made to some of these conditions.

Human factors

Physical, mental and emotional state of the screener undoubtedly played a significant part in the incident. DHB co-ordinators pointed to known stressors in screeners' lives which may have predisposed to the behaviour. Stress may lead to screeners feeling unable to deal with parental emotions at this sensitive time and taking a 'short cut' that they may perceive carries minimal risk to the individual baby.

The most common source of workplace stress it seems is the pressure to screen lots of babies, resulting perhaps in an emphasis on completion of screens at the expense of a quality service. Screening in the immediate post-natal period can also be a pressured time for parents with a lot of other demands, such as establishing breast feeding. Aside from ensuring adequate screener numbers, DHBs should reassess whether the drive to 'catch' families before they are discharged from hospital would be better balanced with home visiting or outreach, and provide guidance to screeners in assessing readiness for screening. As recommended in the UK NHSP, reducing stress in the role could begin with:

- reducing unhealthy pressure to meet targets
- optimising environmental conditions as far as possible
- training in communicating uncertain news
- increasing respect for screener role including greater support from midwifery team
- having regular team meetings and promoting an open culture within screening teams.

Communicating results

The fact that a quarter of screeners in the survey found conveying referral results and settling babies to be stressful suggests that these areas also need to be addressed, as they could compromise the quality and delivery of the UNHSEIP. Further training and support on communicating in difficult circumstances may be beneficial.

Recruitment

The UNHSEIP has not linked the screener role to a requirement to have a health background. Only half of our screeners surveyed had been employed in the health sector prior to becoming a newborn hearing screener. Screeners are required to have a substantial knowledge of the details and theory of screening, are required to work autonomously, and need to be confident in dealing with some difficult situations. This makes investing in recruiting the right people as screeners particularly important. The level of personal integrity that may exclude non-protocol practices is not easy to ascertain on interview, however good communication skills, empathy, and ability to work under pressure and as one audiologist put it, a 'reasonably robust personality' are important. It is also critical following this incident to insist on reference checks from the previous employer.

Equipment

Most screeners agreed that the screening test was easy to do and the proportion of screeners who agreed that AOAEs and AABRs were easy to perform was similar. Some screeners however expressed some frustration with the screening equipment, particularly the new model of Accuscreen.

Protocol

Some considered the protocol cumbersome. Many screeners expressed a dislike of the scripts they are obliged to use prior to obtaining consent and after screening. Updating the scripts to be more user and receiver friendly, or investigating an alternative method of delivery of this information, could be cost-effective.

Opportunities for development/ training

A significant proportion of screeners felt that there are not enough opportunities in the UNHSEIP to learn new skills and extend themselves. Providing more opportunities to progress to lead screener or screener training roles may retain staff and promote continued striving for high performance. Greater flexibility to cross credit to related jobs could also be explored. The fact that many of the screeners in question had significant length of service or experience may reinforce the importance of a career path for screeners.

On-going education/study days for screeners are important in maintaining engagement in the programme and these opportunities for development vary between DHBs. Compliance audits to date have found gaps in screener adherence across a range of areas of protocol and recommended some retraining. The number who said their role is 'hard' could also suggest the need for refresher courses. Improving networking of screeners is another suggestion.

Another area of dissatisfaction was around poor communication with regards to feedback on performance, especially for new screeners. This is of concern, as performance measures and feedback play an important role in professional development.

Support from maternity services

It seems that screeners may not always get support in their work from the midwifery team and feel fully accepted as part of the maternity unit. There may be useful lessons from the UK NHSP emphasis on encouraging midwives and screeners to work together, for example in settling the baby prior to screening.

Engagement with the UNHSEIP

Some respondents reflected on how to improve screener engagement with the programme and understanding of responsibilities, as well as the boundaries of their role. It was suggested that many screeners may have a low level of understanding of screening (most screen positive babies **will** be normal on diagnostic testing, which is expected) and of the ethics of screening. Greater attention in screener training to ethics, understanding of their role in the screening pathway and the importance of adhering to protocols to ensure quality would be beneficial. The response to the NHS incident included reinforcing to screeners of the value of the programme and the impact it can have on families. Another area for potential strengthening is the standard DHB pre-training orientation, which should include visits to audiology and the AODC to gain greater depth of understanding about the programme. It appears that many screeners are not reliably receiving feedback on the outcome of babies referred to audiology. Feedback helps screeners to feel engaged in the programme and have a sense of value about their role. This area needs to be examined further.

Recommendations for the screener role

6. The NSU should lead development of a guide for recruitment of newborn hearing screeners.
7. DHBs should be proactive in providing training opportunities for screeners and reducing stress that may impact on screeners' ability to do their work including:
 - ensuring that the workload of screeners enables a quality screening service, assessing the priority to screen prior to discharge and whether adequate alternatives to postnatal ward screening are provided
 - facilitating regular opportunities for screeners to retrain in programme protocol as well as areas identified in the screener survey as difficult e.g. dealing with difficult clients
 - timely follow-up of recommendations arising from compliance audits on environmental conditions and IT processes
 - providing information to screeners about services available to manage stress
 - increasing awareness, respect and support for the screeners' role among maternity service teams.
8. DHBs should consider the remuneration framework for screeners in relation to comparable roles and level of responsibility and skill, looking at opportunities for consistency in screener pay scales nationally as well as options for a career path for screeners who are keen to further develop their skills.
9. The NSU must implement the Newborn Hearing Screener Competency Framework for all screeners within the next six months.
10. The NSU must review the material covered in screener training and continuing professional development with a view to including more about the ethics and theory of screening.
11. The NSU should reconsider operational policies for daily checking of screening equipment and provision of results of the screen to parents.
12. The NSU must lead updating of the screener scripts to be more concise, clear and in plain English, and/or investigate other modes of delivering information about the programme to families.

The co-ordinator role

The UNHSEIP co-ordinator has a critical role in ensuring the quality of the DHB newborn hearing screening programmes, including close oversight of screener performance.

The first surveillance audits have found a weakness in programme co-ordination in some DHBs with insufficient resources allocated to the role. Across DHBs, the roles and responsibilities for newborn hearing screening coordination have been found to be vague and inconsistent, and the level of knowledge and experience of the co-ordinator variable.

Some of the larger DHBs with stronger programmes have successfully allocated some co-ordination functions to a lead screener and have close involvement of a lead audiologist, particularly for programme monitoring activities.

The revised UNHSEIP NPQS provide clear expectations of programme co-ordination, however a collation of this in the form of a defined co-ordinator role description may be helpful.

It is apparent that many new co-ordinators have little or no introduction to or guidance in the role. The NSU plans to develop a manual for co-ordinators and this will be helpful. Taking a lead from the UK NHSP experience, provision of on-site training for co-ordinators, including programme monitoring, would be beneficial, as would the requirement to do the screener training so that they understand the screener role. Education for co-ordinators in screening theory and ethics also is important.

Recommendations for the co-ordinator role

13. The NSU and DHBs need to ensure that co-ordination of the UNHSEIP is adequately resourced. Sufficient time must be available for a co-ordinator and/ or lead screener to have a strong focus on monitoring of individual screener and programme data, and on continuing professional development of screeners.
14. New UNHSEIP co-ordinators must be provided with a co-ordinator manual and be required to do components of the screener training. The NSU should facilitate regular practical training for co-ordinators and regular opportunities for co-ordinators to communicate.
15. The NSU and DHBs must review processes for information dissemination to ensure co-ordinators are aware of all developments in the programme.

Audiology

It is apparent that a strong practical working relationship between the audiology and screening teams has many benefits for the programme. Audiologist support for programme data analysis is helpful and should be encouraged. Audiologists can also assist screeners maintain a sense of engagement by giving feedback on the outcome of assessment of referred babies. Some audiologists have provided additional training sessions for screeners which have been very well received.

Recommendations for audiology

16. DHBs should promote the engagement of audiologists with the UNHSEIP and a supportive working relationship with screeners through:
 - audiologist support for programme monitoring, clinical queries and in-service training for screeners
 - ensuring audiologists provide feedback to screeners on babies screened
 - orientation to audiology for new screeners.

Programme management

As evident from the discussions with DHB personnel, visibility of and accountability for newborn hearing screening above the direct service level is low. Nor is there a clear clinical governance framework over the programme in most DHBs. In most DHBs there is a poor understanding of quality requirements for screening, and possibly a perception that the programme is primarily managed by the NSU.

Integration of newborn hearing screening into DHB services is important and should cover maternity, paediatrics, audiology, ENT, Well Child, and other supports such as Māori and Pacific health workers. Regular multidisciplinary meetings for newborn hearing screening currently held in some DHBs are beneficial.

As the current incident clearly demonstrates, strong links with the DHB quality team are important as is regular reporting to the clinical board and/or executive.

Recommendations for programme management

17. DHBs must have clearly defined lines of management and accountability for UNHSEIP services, as per the UNHSEIP National Policy and Quality Standards.
18. DHBs need to support the programme by facilitating strong links with relevant teams within the DHB, for example quality and maternity teams.
19. DHBs must establish a clear multi-disciplinary clinical governance framework for the UNHSEIP within the DHB. Regular meetings are recommended.
20. A national centralised database that is accessible to DHBs would facilitate streamlined and accurate quality monitoring and should be fast-tracked.
21. Once the recommendations are accepted, the NSU must develop an implementation plan in consultation with the UNHSEIP Advisory Group, who should monitor and review the implementation of the recommendations for completion.

Appendix 1

Summary incident timeline

This timeline starts at the time of initial concern regarding screening for one baby at ADHB through to confirmation of an incident at Waitemata DHB in November 2012.

Date/Time	Event	Organisation	Notes
June 2012	Screeener advised by parents that the baby had already been screened – no data on form.	ADHB	
June	Review of screening data commenced and completed.	ADHB	Changing patterns of screening identified significant change in referral rate percentage from July 2011 (11% drop to 5%) dropping to 1% (0-3%) from November 2011: Screening results with too short a time period between screens Possibility of screening same ear twice and using own ear for test results.
June	Two similar incidents in UK programmes were identified in 2011.	ADHB	Note UK do not have records of calibration levels
June	1. ADHB: The total number of babies screened by the screener for the period 1 July 2011 – 11 July 2012 is 1044. Analysis of the screener results has identified: 145 babies who had screening in one ear twice 183 babies who had screening in one ear with one ear of screener 103 babies who had results recorded from the screener recording her own ear results.	ADHB	ADHB is recommending that all 1044 babies screened by this screener be offered re-screening.
20 July	Incident notification report received by NSU	ADHB	
24 July	NSU /ADHB meeting to discuss ADHB investigation, action to date and next steps.	Auckland	ADHB convened an incident group and escalated notification to senior ADHB management.

Date/Time	Event	Organisation	Notes
26 July	Teleconference with MOH Chief Advisor, NSU staff, ADHB GM, CD and Audiologist –	NSU-MOH & ADHB	
30 July	ADHB incident and risk evaluation report and draft comms plan received by NSU	NSU-MOH	More detailed investigation has determined that 431 babies may not have been correctly screened - “well babies” (low risk) screened between April 2010 and June 2012.
1 August	2.HVDHB: Telephone notification to NSU regarding identification of an issue with a screener not following protocol following routine look at screening data over the past six months.	HVDHB	HVDHB have advised that the screener in question has resigned. Written notification report requested from HVDHB.
2 August	Teleconference with all DHBs regarding need to review individual screener performance data and reinforce importance of screeners role in quality of screening	NSU-MOH All DHBs	
3 August	Incident form received from HVDHB Head Audiologist.	HVDHB	HVDHB CEO; Executive Director of Allied Health; Director of Operations, Surgical, Women’s & Children, Director of Operations, Surgical, & Comms notified. Analysis of the screener results has identified a total of 176 babies incorrectly screened: 61 babies had no screening. 115 had one ear screened followed by the screener’s ear.
8 August	Email re <i>Protocol for monitoring screener practice using data downloads</i> sent to all DHBs by NSU and feedback required by Friday 10 August - whether currently able to review data by individual screener - whether screening data is currently stored in a format that enables this analysis. Full analysis required from DHB to NSU by 24 August	NSU	Protocol includes: Setting up for review Analysis of data – high level indicators (AABR referral rate), second level checks (timing and calibration) and third level confirmatory check (DPOAE results) Results reporting template provided

Date/Time	Event	Organisation	Notes
Week 13 August	ADHB: 1,263 letters sent to parents and well child providers as per ADHB communication plan.	ADHB	Weekly report template sent.
14 August	HVDHB: 924 letters commenced being sent to parents and well child providers as per HVDHB communication plan. Week 1: 104 letters sent to babies under three months with phone follow up	HVDHB	HVDHB to report weekly in template to record letters sent, numbers screened, declined and outcomes
14 August	3. Canterbury DHB: NSU advised by CDHB of identification of an issue with a screener not following protocol following NSU request DHB undertake individual screener data analysis.	CDHB, MOH	Telephone conversation with CDHB UNHSEIP Coordinator; CDHB Quality Coordinator; UNHSEIP Programme Leader and NSU Service development Analyst. NSU Incident template sent to CDHB and teleconference scheduled.
15 August	NSU Incident notification received from CDHB	CDHB, MOH	CDHB Service Manager, Charge Audiologist, HR and Comms notified.
20 August	HVDHB 200 letters sent with rest to be sent as follows: 250 22 August 200 10 September 220 12 September		
21 August	4. Lakes DHB data shows anomalies - sent for ADHB audiologist for review.	LDHB	Lakes to provide additional data; seek review with LDHB audiologist 23 rd and provide NSU with update.
3 September	NSU internal UNHSEIP Incident Group weekly meetings established to monitor incidents	NSU	
3 September	Teleconference with UK Hearing Screening programme to discuss similar incidents between UK and NZ hearing screening programmes.	NSU NHS ADHB Lead audiologist	
14 September	LDHB: Completed NSU Incident Notification and comms plan received from LDHB		
20 September	5. Bay of Plenty DHB: Phone call from BOPDHB advising outlier results that require further investigation.	NSU BOPDHB	

Date/ Time	Event	Organisa- tion	Notes
1 October	1 st UNHSEIP Technical Expert Panel (postponed from 24 September) meeting	NSU	
1 October	CDHB commenced sending 487 recall letters	CDHB	
3 October	1 st UNHSEIP Incident Review Group meeting	NSU	
4 October	BOPDHB: NSU Incident Notification received	NSU BOPDHB	
5 November	2 nd UNHSEIP Incident Review Group meeting	NSU	
14 November	BOPDHB commence rescreens – 3 clinics per week until 30 November	BOP	
16 November	TEP member identified evidence of screener not following protocol at Waitemata DHB	NSU	
19 November	2 nd UNHSEIP Technical Expert Panel meeting	NSU	
19 November	UNHSEIP Incident Review Group meeting	NSU	
21 November	8. Waitemata DHB: UNHSEIP Coordinator advised evidence of screener not following protocol and t/c to be scheduled 23 November	NSU, WDHB	

Appendix 2

Protocol for monitoring screener practice using data downloads

Sent to DHBs August 2012

Note: this document was subsequently revised based on the data audit experience and sent to DHBs 30 November 2012 for continued monitoring.

Background

Recent incidents have identified the need for more rigorous monitoring of newborn hearing screening results downloaded into DHB information systems.

Data from screening equipment can be extracted and analysed to monitor individual screener performance against UNHSEIP screening protocols. Where values are noted outside of the expected range, further detailed data analysis is required.

Three scenarios of screener practice counter to the protocol have been identified:

- one ear of the baby is screened twice
- one ear is screened from the baby and one ear screened from the screener's own ear
- both results are from screener's own ear.

The initial data analysis period is the previous six months, however the requirement to undertake this review as a routine aspect of monitoring individual screener practice will be included in the revised UNHSEIP National Policy and Quality Standards.

Setting up your review

Screening equipment needs to be correctly set up with screener ID to enable the screener's name/initials to be recorded against each data download. The screening equipment technical support person may need to support you to do this if this is not the case for your DHB. If screener ID is not in the equipment already you will not be able to analyse past screenings according to this protocol. It is important that screener ID is entered promptly to enable routine monitoring from now on.

Create a master folder for data downloads. Your IT department can help with setting up a standardised folder format. The key is to have a consistent file system and for all staff to follow the same format and protocol. Again, if not already stored systematically it may be difficult to undertake this analysis for past data.

If the DHB has fixed multiple sites then create subfolders identifying each unit of screening equipment and the time period e.g.

Accu 1 - year –month-day

Accu 2 - year-month-day

Accu3 – year- month- day

Both Acculink format and excel spreadsheets need to be saved for these reviews.

Note: All data files should be permanently backed up/archived on a regular basis preferably to a DHB network drive or to permanent media stored at a different location (your IT department will be able to advise and assist with this)

Analysis of Data

There are three levels of areas to be reviewed for non-protocol screening practice. These can be thought of much like a screening process:

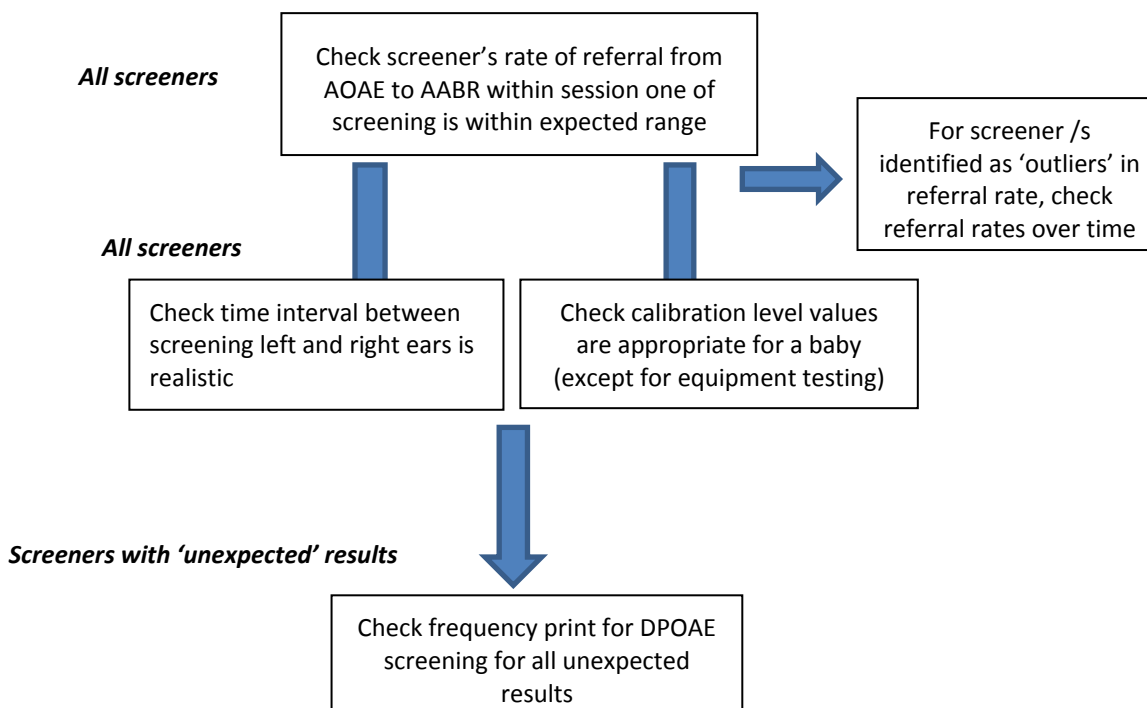
High level indicator - the screener's rate of referral from AOAE to AABR within session one of screening

Tests for 'unexpected' results

the time intervals between screening left and right ears

the calibration level values

Confirmatory testing: the frequency print for DPOAE screening is used to confirm that proper practice has been followed.



1. HIGH-LEVEL INDICATOR - AABR referral rate check

The first analysis is to examine AABR referral rate by each screener. This is the proportion of AOAE tests in which a refer result (to AABR screening) is obtained. AABR referral rate gives an indication as to screener performance, but is influenced by a variety of factors. A low rate of referral can be a 'red flag' that prompts more detailed investigation.

Comparative AABR referral rate

Take a detailed look at the AABR referrals by each screener over the last 6 month period. To do this, the data in excel will need to be sorted by screener. These summary numbers can then be placed in a table as demonstrated below, which shows the number of OAE screenings performed for the time period and the proportion resulting in a refer result to AABR for each screener (note the numbers are just examples, not to be taken as expected results).

Table A2- 1: AABR referrals by individual screener

Time period				
Screener	OAE	Percentage referral to AABR	FTE	Comment
1	200	14%	.5	
2	220	23%	.8	More NICU
3	200	12%	.5	
4	200	13%	.6	
5	220	14%	.5	
6	240	28%	1	Senior Screener
7	200	18%	.5	NICU cases
8	160	16%	.5	
9	200	4%	1	Identified screener

Observe for unexpected results rate of referrals. In table 1 above, it can be seen that Screener 9 has a much lower rate of referrals to AABR. This is much lower than the other screeners and would indicate that there may be an issue with this screener's performance.

It is suggested that the referral rate should be between 12-20%. Any screener who has a rate outside of the expected (especially one that is much lower) needs to be investigated further. Note that the referral rate will vary according to several factors including screener experience - less experienced screeners are more likely to over-refer.

AABR referral rate over time

If you identify that the referral rate from any individual screener is unexpectedly low, the next step is to go back over the entire period when they were screening, to see if

there is any change in referral rates over time. Produce a table of the results, as shown in the example table below (note the numbers are just examples, not to be taken as expected results).

Table A2- 2: Referral rates from OAE to AABR (session one) for outlier screener

Period	Percentage Refer to AABR
1/4/2012 – 30/4/2012	19%
1/5/2012 – 31/5/2012	15%
1/6/2012 – 30/6/2012	15%
1/7/2012 – 31/7/2012	5%
1/8/2012 – 31/8/2012	4%
1/9/2012 – 30/9/2012	1%
1/10/2012 – 31/10/2012	1%

From the above it is evident that although initial rates of referral were in the expected range (12-20%) these deteriorated after 1/7/2012.

It is important to remember that this high-level indicator just helps to identify screeners who lie outside of the usual range and suggests their practice be looked at in more detail.

2. SECOND LEVEL CHECKS

2 (a) Timing check

This is a review of timing indicators from the data download.

Using Accuscreen data on an excel sheet, look at times between screens in the left and right ear, which should not in most cases be under 1 minute.

Record in the exceptions table when the following is observed:

- a. time between L and R ear less than 40 seconds
- b. time between L and R ear greater than 20 minutes.

Times between screening of babies also need to be realistic, allowing for data entry and the consent process.

Appendix 1 gives detailed examples of this process.

Any identified exceptions need to be cross-checked as per the third level check.

2 (b) Calibration level check

This check looks at the calibration level for a DPOAE screen, which is dependent on the size of the ear canal.

Look at the 'Cal Level' column and check to see if cavity level is consistent with an adult or baby:

- the value for an average adult should be under 20
- the value for an average baby is typically between 20 and 30.

Record in the exceptions table when the following is observed:

- a. 'Cal levels' for test runs that are measured as more than 20
- b. 'Cal levels' for babies that are measured as less than 20.

See examples in *Appendix 1*.

If the 'Cal Level' is consistent with an adult ear, cross check the result with the DPOAE result as below.

3. THIRD LEVEL CONFIRMATORY CHECK OF EXCEPTIONS

DPOAE result

The confirmatory step is to review the DPOAE frequency print of all of the screens detected as 'exceptions' in the above checks – ie outside parameters. A person with audiology experience or a person with experience in reading frequency prints should carry out this check. Note that the frequency print is only seen in Acculink data.

The DPOAE result is reasonably consistent for a given individual's own ear. Look for frequency prints which:

- are identical between left and right ears
- are identical to the screener's own frequency print.

See the examples in *Appendix 1*.

If the calibration level suggests an adult ear and the DPOAE result is very similar to the screener's own ear test, it is likely that the screener is using their own ear.

Results

The following result table must be sent to the NSU. Note the first three rows have been completed as examples only.

Screeener	FTE	Referral rate AOAE/AABR	Number of unexpected timing check results	Number of unexpected timing checks confirmed as irregular by DPOAE check (A)	Number of unexpected calibration level checks	Number of unexpected cal. level checks confirmed as irregular by DPOAE check (B)	Total number of checks confirmed as irregular (A+B)	Comments e.g. any unexpected rates of DPOAE referral
1	0.5	0.14	2	0	0	0	0	
2	0.8	0.23	3	0	0	0	0	New screener
3	1	0.04	69	60	34	34	94	Much lower referral rate since 09/2011 (from 11% to 4%)
4								
5								
6								
7								

Next steps

If you have identified a screener/screeners where practice is deviating from the protocol, notify the NSU before proceeding with the following investigations.

- What is the time period concerned?
- How many babies are affected?
- Are the babies involved able to be confirmed as well babies with no risk factors?

Ensure that the analysis and findings are available for review.

Appendix 2.1 Examples

Methods of detecting three scenarios for non-protocol practice that have been identified will be described in turn:

- scenario one: one ear of baby screened twice
- scenario two: one ear screened from baby and one ear screened from screener's own ear
- scenario three: both results from screener's own ear.

Scenario one: One ear of baby screened twice

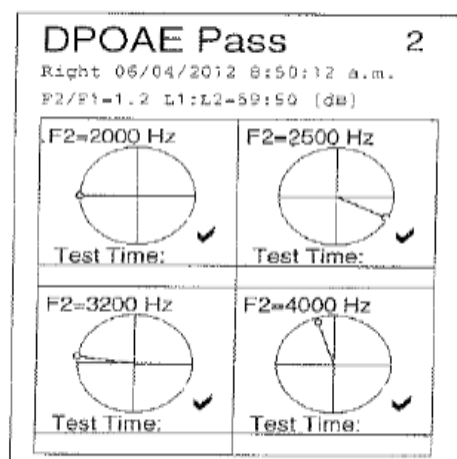
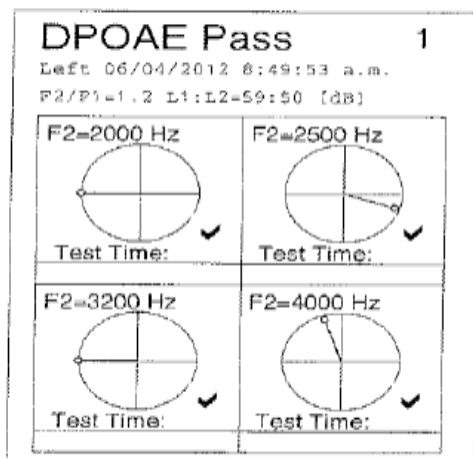
This may be identified by the frequency print being identical to the screener's own ear and a short screening time of less than 1 min. See the example in **bold** below:

Example 1: Demonstrating less than 1 minute between left and right ear testing

PATIENT ID	DATE OF BIRTH	DATE	TIME	EXAMINER	EAR	(OVERALL) RESULT
1	04/06/2012	04/06/2012	7:21:35	XX	R	Refer
2	04/06/2012	04/06/2012	7:24:39	XX	R	Pass
3	04/04/2012	04/06/2012	8:49:53	XX	L	Pass
3	04/04/2012	04/06/2012	8:50:12	XX	R	Pass
4	04/04/2012	04/06/2012	9:57:00	XX	R	Pass
4	04/04/2012	04/06/2012	9:58:37	XX	L	Pass
5	04/04/2012	04/06/2012	10:07:14	XX	R	Pass

Example 2: Demonstrating identical frequency print between left and right ears

No:	Test Type	Ear	Test Date	Test Time	Result
1	DPOAE	Left	06/04/2012	8:49:53	a.Pass
2	DPOAE	Right	06/04/2012	8:50:12	a.Pass

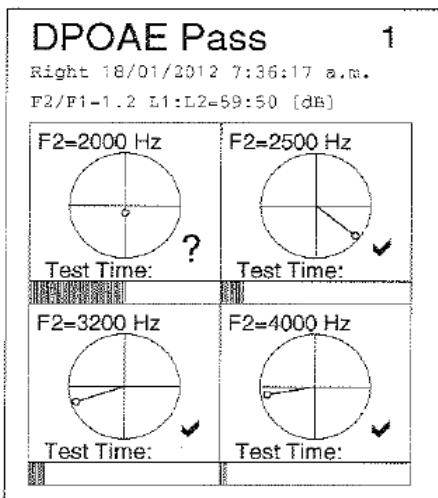


Scenario two: one ear screened from baby and one ear screened from screener's own ear

This may be identified by the frequency print of the second ear being identical or similar to the screener's own ear recorded on daily checks. Timing is less helpful here but there may be a time difference between first and second ear of more than 4 mins.

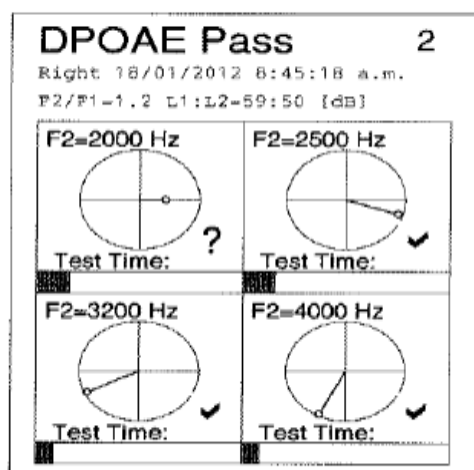
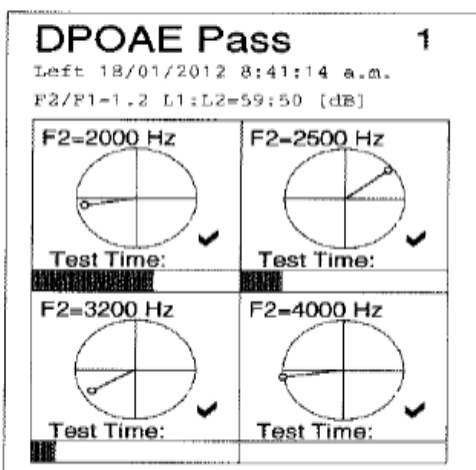
Example 3: Showing the same frequency print for both the examiners ear and one ear of the baby

No:	Test Type	Ear	Test Date	Test Time	Result
1	DPOAE	Right	18/01/2012	7:36:17 a	Pass



EXAMINER'S EAR

No:	Test Type	Ear	Test Date	Test Time	Result
1	DPOAE	Left	18/01/2012	8:41:14 a	Pass
2	DPOAE	Right	18/01/2012	8:45:18 a	Pass



Scenario three: both results from screener's own ear

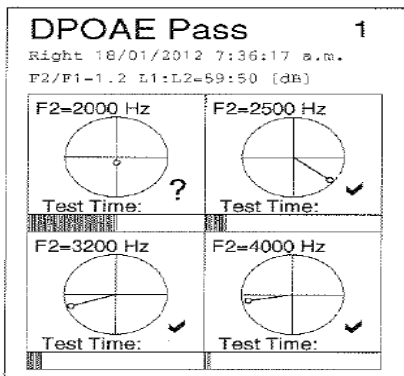
This may be identified by the frequency print being identical or similar to the screeners own ear recorded for both left and right on a babies results. Timing may also indicate insufficient time between babies (< 1 minute) for consent/results/paperwork.

Example 4: Demonstrating less than 1 minute between left and right ears

PATIENT ID	DATE OF BIRTH	DATE	TIME	EXAMINER	EAR	(OVERALL) RESULT
1	01/11/2012	01/11/2012	8:27:12	XX	R	Refer
2	01/11/2012	01/11/2012	8:28:55	XX	R	Pass
3	01/07/2012	01/11/2012	9:02:14	XX	R	Pass
3	01/07/2012	01/11/2012	9:02:45	XX	L	Pass
4	01/09/2012	01/11/2012	10:41:43	XX	R	Pass
4	01/09/2012	01/11/2012	10:47:42	XX	L	Pass
5	01/10/2012	01/11/2012	13:26:15	XX	R	Pass
5	01/10/2012	01/11/2012	13:29:16	XX	L	Pass
6	01/10/2012	01/11/2012	13:19:43	XX	R	Pass
6	01/10/2012	01/11/2012	13:22:17	XX	L	Pass
7	01/08/2012	01/11/2012	12:24:55	XX	L	Pass
7	01/08/2012	01/11/2012	12:35:14	XX	R	Pass

Example 5: Showing the same frequency print for the examiners ear and both ears of the baby

No:	Test Type	Ear	Test Date	Test Time	Result
1	DPOAE	Right	18/01/2012	7:36:17 a.m.	Pass



EXAMINERS EAR

Appendix 2.2 Calibration level example

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	LAST NAME	FIRST NAME	DATE OF BIRTH	IN/OUT	TEST TYPE	DATE	TIME	LOCATION	EXAMINER	EAR	(OVERALL) RESULT	CAL LEVEL	CAL RESL	FREQUEN	FREQUEN	FREQUEN	FREQUEN	
2	TEST	CAVITY	01/22/2012	Out	DPOAE	01/22/12	7:44:28		XX	R	Refer	16	0	2000	2600	3200		
3	TEST	EAR	01/22/2012	Out	DPOAE	01/22/12	7:46:01		XX	R	Pass	15	0	2000	2600	3200		
4	Baby1		01/20/2012	Out	DPOAE	01/22/12	8:07:40		XX	L	Pass	29	0	2000	2600	3200		
5	Baby1		01/20/2012	Out	DPOAE	01/22/12	8:16:06		XX	R	Pass	16	0	2000	2600	3200		
6	baby2		01/20/2012	Out	DPOAE	01/22/12	9:07:08		XX	R	Pass	16	0	2000	2600	3200		
7	baby2		01/20/2012	Out	DPOAE	01/22/12	9:10:14		XX	L	Pass	15	0	2000	2600	3200		
8	baby3		01/20/2012	Out	DPOAE	01/22/12	8:41:42		XX	L	Pass	29	0	2000	2600	3200		
9	baby3		01/20/2012	Out	DPOAE	01/22/12	8:47:35		XX	R	Pass	14	0	2000	2600	3200		
10	baby4		01/19/2012	Out	DPOAE	01/22/12	11:11:03		XX	L	Pass	15	0	2000	2600	3200		
11	baby4		01/19/2012	Out	DPOAE	01/22/12	11:13:58		XX	R	Pass	15	0	2000	2600	3200		
12																		
13																		
14																		

Check to see if cavity level is consistent with an adult or baby:

- an average adult should be under 20 (15 in this case recorded in line 2 of results)
- an average baby is typically between 20 and 30.

Baby1 screener used baby's ear for left and own ear for right

Baby2 screener used their own ear twice

Baby3 screener used baby's ear for left and own ear for right

Baby4 screener used their own ear twice

For Baby 1:

- The spreadsheet data is consistent with a baby's left ear but an adult's right ear.
- Compare the right ear result (recorded as the baby but is an adult ear) with the screener's ear test for the same day
- If the calibration level suggests an adult ear and the DPOAE result is very similar to the screener's own ear test that, it is likely the screener is using her own ear.

BABY 1
 DOB: 2/08/2012 Patient ID: NHH1234
 Examiner: JB
 DPOAE - Pass

Left ear: 3/08/2012 10:20:14 am

F2 = 2000Hz

✓

F2 = 2500Hz



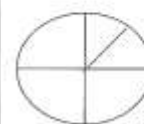
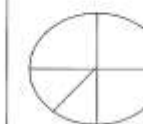
✓

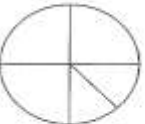



F2 = 3200Hz

✓

F2 = 4000Hz

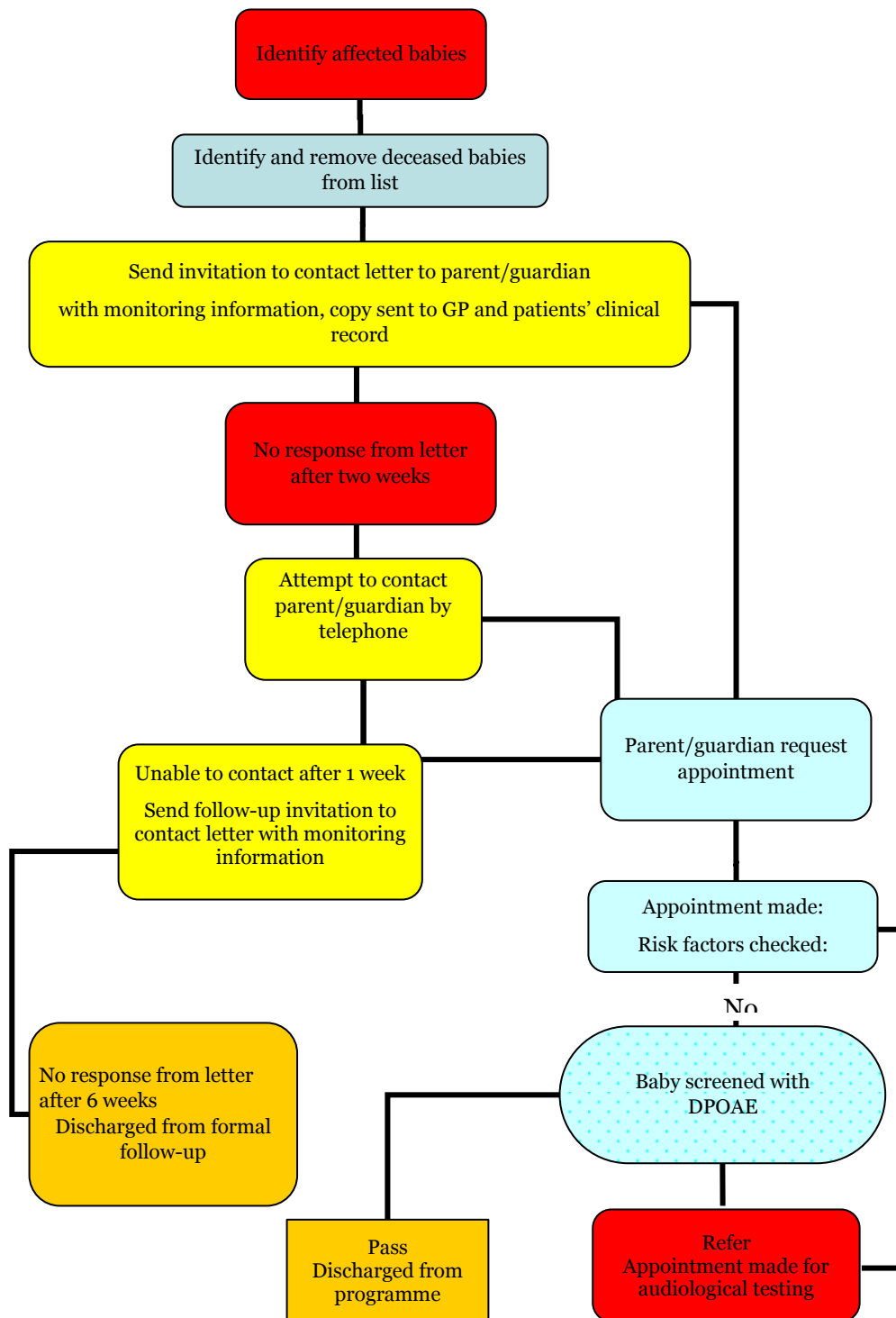
✓

BABY 1, DOB: 2/08/2012 Patient ID: NH1234 Examiner: JB DPOAE - Pass Right Ear: 3/08/2012 10:29:14 am			
F2 = 2000Hz 	F2 = 2500Hz 	F2 = 3200Hz 	F2 = 4000Hz 

TEST EAR DOB: 3/08/2012 Patient ID: 02 Examiner: JB DPOAE - Pass Right ear: 3/08/2012 7:30:33 am			
F2 = 2000Hz 	F2 = 2500Hz 	F2 = 3200Hz 	F2 = 4000Hz 

Appendix 3

Sample Re-screening Pathway



Appendix 4

Sample recall letter

Dear Parent or Guardian

Newborn Hearing Screening undertaken at ××××

Soon after birth, your baby had their hearing tested. This service has been offered to all newborn babies in New Zealand for the last three years.

We have since found a problem with one part of the screening process and there is a very small possibility that a baby with a hearing loss could have been missed.

What does this mean?

Moderate or more severe hearing loss affects approximately one baby per one thousand births (1:1000). The audiologists and doctors at ××× DHB believe this risk is low for your baby but we want to ensure your baby is correctly screened. We are offering a rescreening for your baby and the service is free.

Your child has previously been identified as a 'well baby' with no known hearing loss risk factors, which means the probability of your child having a hearing loss is very low.

We would like to offer re-screening at an outpatient audiology appointment at a time suitable to you. It is best if your baby is asleep or settled while this is being done. The Team Leader of Hearing Screening will be in touch with you soon to make an appointment. The test will take approximately 15 minutes to complete.

Please find enclosed a fact sheet about newborn hearing screening. In the meantime, if you have any questions please ring our Audiology Department Monday to Friday between 8.00 am and 4.30 pm on ×××. In the future if you have any concerns about your baby's hearing at any time please contact your family doctor or Well Child Provider.

We regret any inconvenience this may cause, and want to reassure you that we are being extremely cautious in our approach.

Yours sincerely

Appendix 5

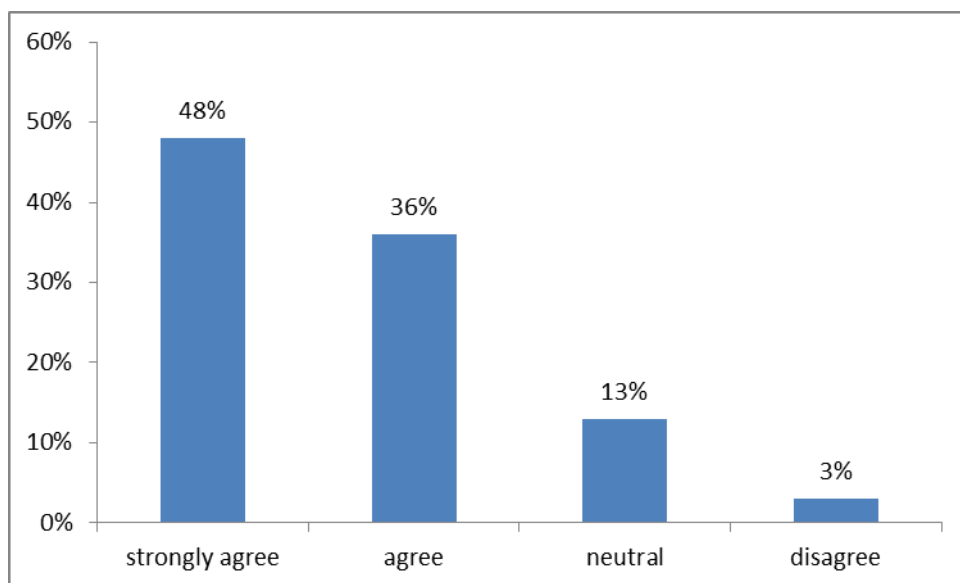
UNHSEIP screener survey

In October 2012 the NSU conducted an online national survey of newborn hearing screeners. The aim was to gain a better understanding of the role of a screener, particularly pressures and challenges associated with the role, likes and dislikes, and areas for improvement.

The survey was sent to all DHBs for newborn hearing screeners to complete (approximately 108 screeners). Sixty-five screeners participated in the survey, resulting in a 60% response rate.

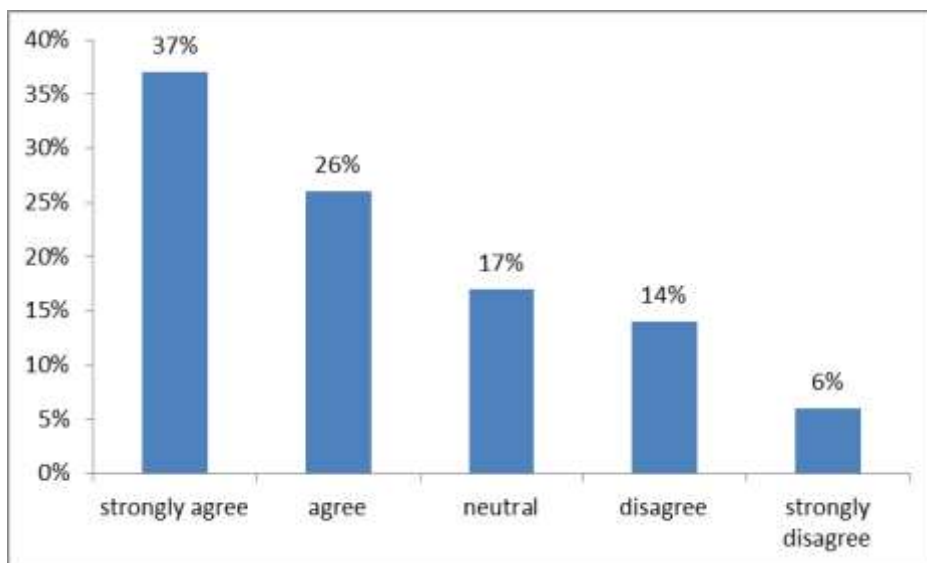
Results

Figure A5- 1: Our screening team gets on well together



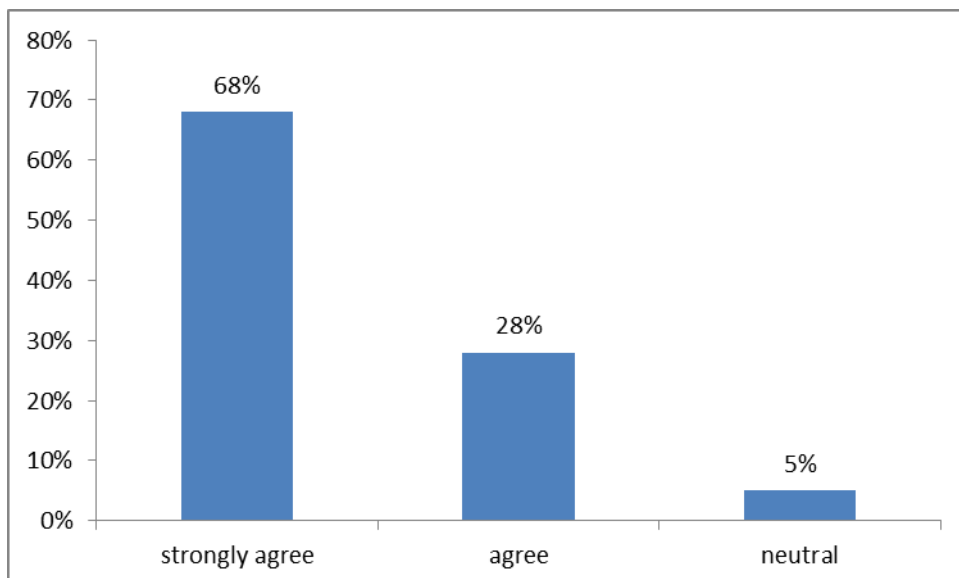
The survey found that the majority of screeners (48%strongly agreed and 36% agreed) felt that their screening team got on well.

Figure A5- 2 I get feedback on the outcome of babies I screen who are referred to audiology



Over a third (37%) strongly agreed and 26% agreed that they received feedback on the outcome of babies referred to audiology. This question provides feedback to the NSU regarding screeners' sense of value about their role. It worth noting that a fifth screeners did not receive feedback on the outcome of the babies they screened who were referred to audiology (14% disagreed and 6% agreed).

Figure A5- 3: I do an important job



A significant proportion of screeners felt that they their role was important (68% strongly agreed and 28% agreed). It is worth noting that none of the screeners surveyed disagreed with this statement.

Table A5- 1: Words used to describe your job

	%
Interesting	79
Caring	74
Rewarding	71
Repetitive	49
Stressful	42
Social	37
Technical	34
Fun	26
Hard	17
Boring	3

Note: percentages do not add to 100% as respondents were able to choose more than one response

Screeners were asked to choose words that best described their job. Table 1 shows that most screeners (79%) described their role as being interesting, followed by 74% saying it was caring and 71% as rewarding. Although nearly half (49%) of the screeners found their job to be repetitive and 42% found it to be stressful, 37% found their job to be social and 26% said it was fun. It is worth noting that 17% found their job to be hard. Also mentioned were 'responsible' (requiring 'sensitivity and integrity') and 'frustrating' ('having to repeatedly interrupt new parents').

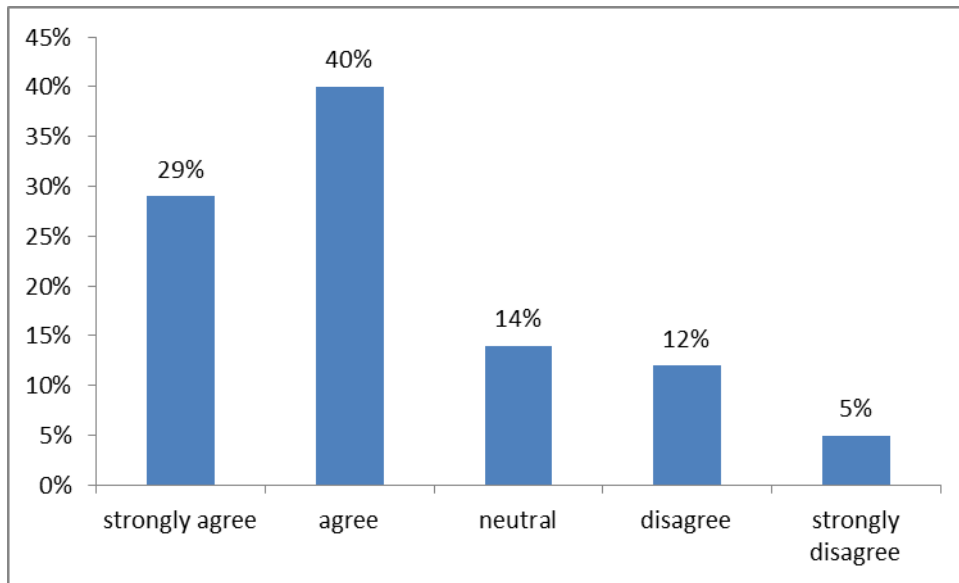
Table A5- 2: Sources of stress in your work

	%
Pressure to screen lots of babies	44
Cramped working conditions	43
Pay and employment conditions	32
Giving a refer result to parents	25
Difficulty settling babies	24
Pressure from other health care staff	21
Feeling of interrupting families at a special time	18
Physical discomfort	14
Using the screening equipment	10
None of the above	14

Note: percentages do not add to 100% as respondents were able to choose more than one response

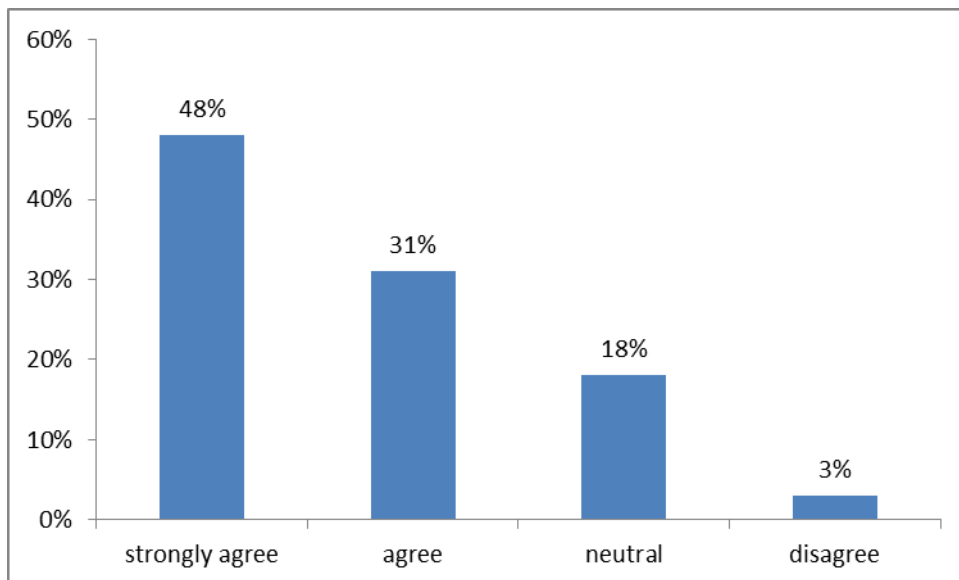
Table 2 examines the sources of stress that screeners face during their working day. The most common sources of stress were the pressure to screen lots of babies (44%) and cramped working conditions (43%). About a third (32%) thought their pay and employment conditions were stressful, followed by a quarter who found conveying referral results and the difficulty in settling babies to be stressful (25% and 24% respectively). Comments included the pressure from parents wanting screening completed but conditions not being right at the time, being interrupted by ward staff during screening, and the workload becoming ‘overwhelming’ when anyone is on leave.

Figure A5- 4: I get feedback on my work performance



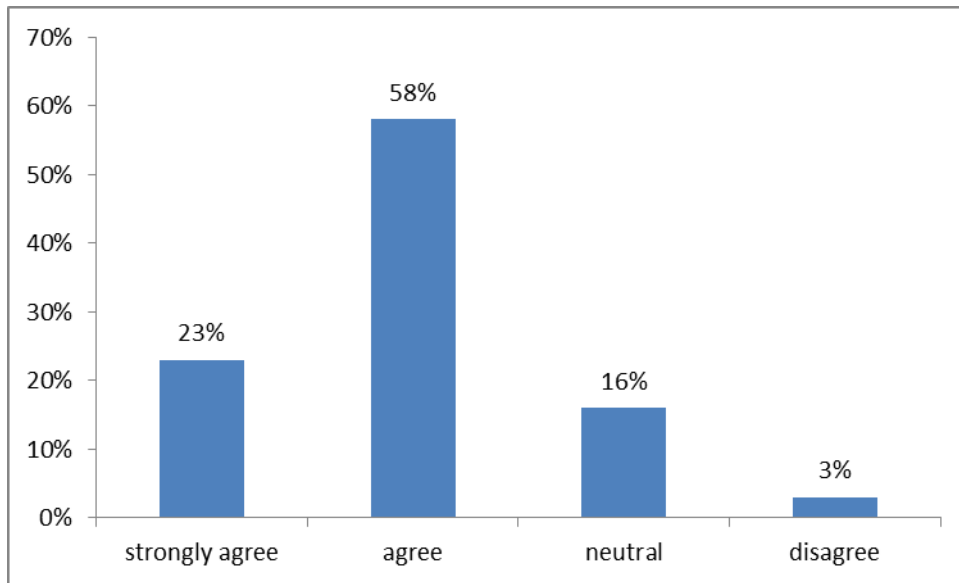
Over two-thirds of the screeners surveyed received feedback on their performance at work (29% strongly agreed and 40% agreed). Just under a fifth of the screeners did not receive feedback (12% disagreed and 5% strongly disagreed that they receive feedback on their work performance).

Figure A5- 5: I feel comfortable asking questions about my work



Over three-quarters of screeners surveyed felt comfortable asking questions about their work (48% strongly agreed and 31% agreed).

Figure A5- 6: AOAEs are easy to do



The proportion of screeners who agreed that AOAEs and AABRs were easy to perform was similar (58% and 62% respectively).

Figure A5- 7: AABRs are easy to do

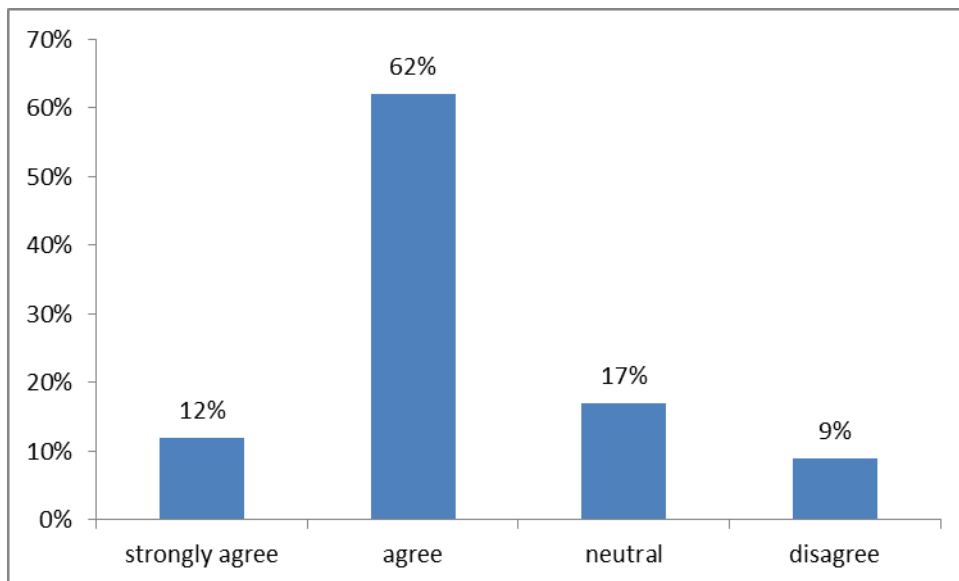
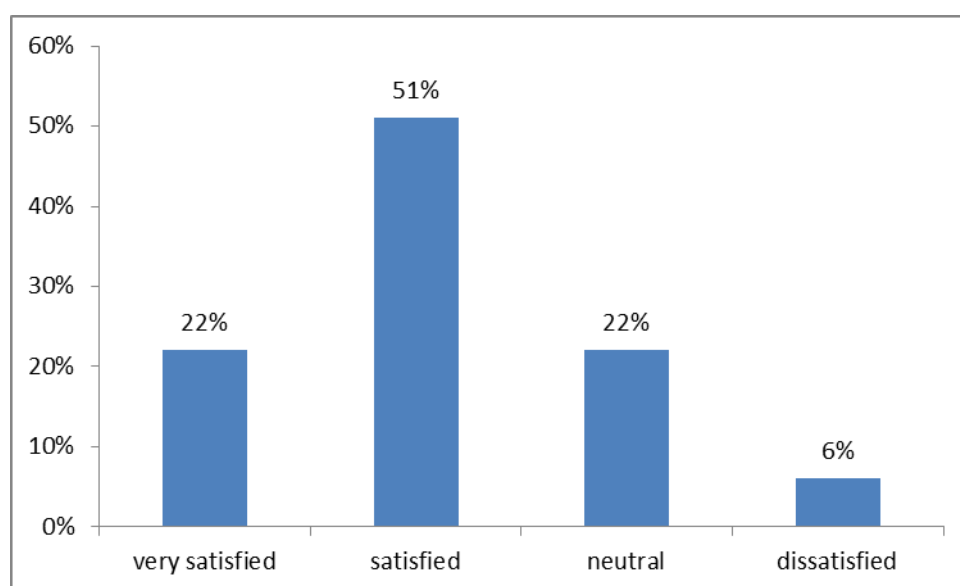


Figure A5- 8: Level of satisfaction with your work

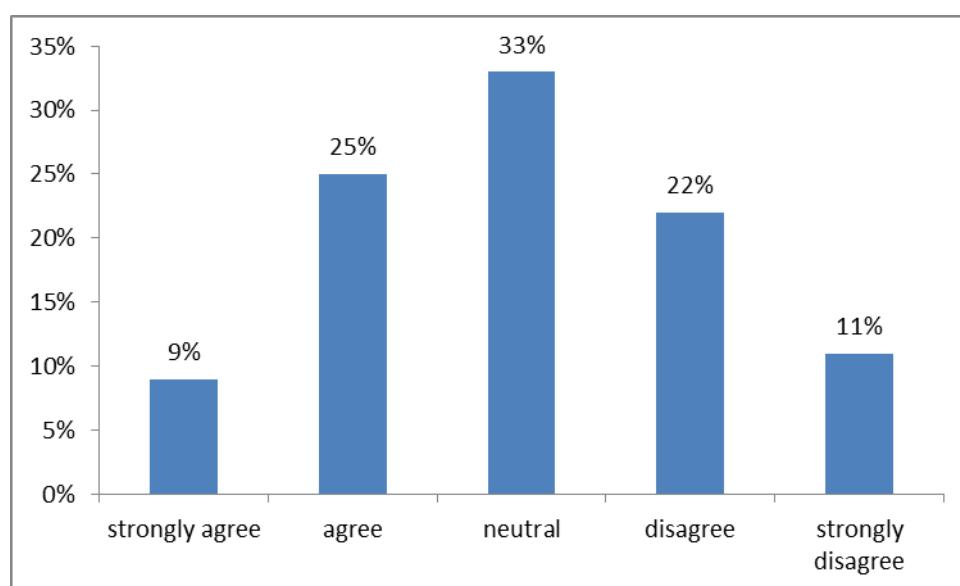


With regards to job satisfaction, over half (51%) were satisfied with their work, and a fifth (22%) were very satisfied with their job. Only 6% expressed dissatisfaction with their work. Screeners were asked to describe their greatest sources of satisfaction and dissatisfaction with their jobs. A thematic analysis showed that most screeners enjoyed the *meaningful* nature of their role and the overall aim of the screening programme (e.g. ‘being part of something so proactive in health’). Other areas of satisfaction were around the pleasure of *interacting* with parents and their families in conveying the outcome of the screening test (‘the relief on parents’ faces when you tell them you have a good result’). They also enjoyed their *work environment*, which included both meeting new families and being part of great team.

Many sources of dissatisfaction were described. The main area was around workload and conditions, including low pay rates. Screeners complained about the amount paperwork required to be completed on top of their screener role, and not having sufficient staff to meet their requirements. They were also unhappy about their working conditions, mainly around working in small cramped offices, the amount of paperwork, and having to perform their screener role in noisy rooms, which made it difficult for them to screen babies accurately. Some screeners felt that this demonstrated a lack of appreciation of their role. They also felt that their pay rate did not value their role and job expectations ‘our role is a really big responsibility and stressful, but our hourly rate is so low’. ‘Dealing with angry parents when you give them a refer result’ was also mentioned.

Another area of dissatisfaction was around poor communication with regards to feedback on their performance, especially for new screeners. Some screeners felt frustrated with the screening equipment and the screening process, for example the ‘length of time it can take for an AABR to run even under favourable conditions’. With regards to equipment, difficulties were associated with the interpretations of calibrations and the cable on Accuscreen. In terms of the screening process, the protocol and process was considered cumbersome, ‘a lot of parents are not interested in the talk we give and you just see them shutting off - they just want it done’.

Figure A5- 9: Enough opportunities in UNHSEIP to learn new skills and extend myself



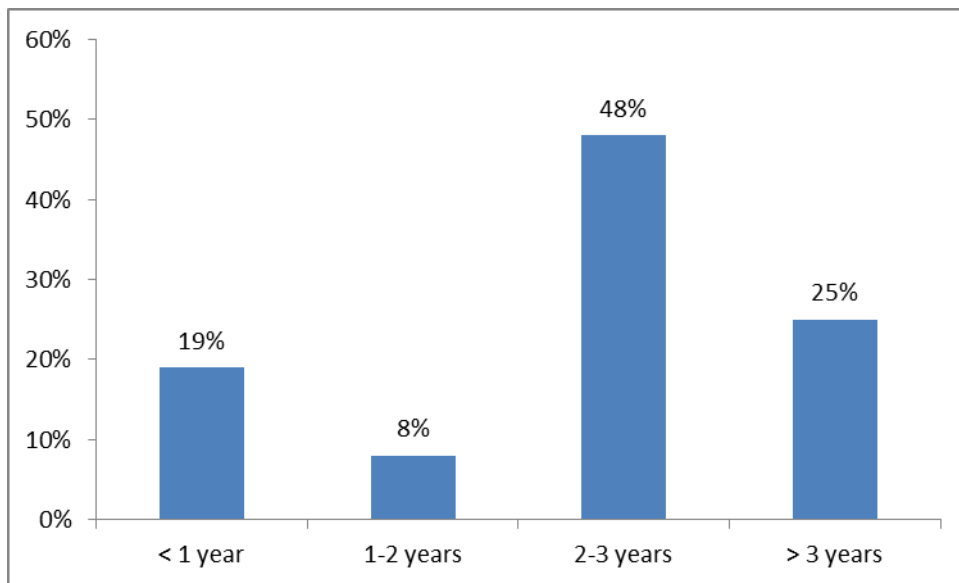
In terms professional development, the proportion of screeners that strongly agreed/agreed and strongly disagreed/disagreed that there were sufficient opportunities to learn new skills was similar, 34% and 33% respectively.

Table A5- 3: Sector of employment prior to becoming a newborn hearing screener

	%
Health professional	33
Other health	24
Administration	19
Education	17
Retail	3
Home	2
Student	2
Hospitality	0

Half of the screeners were employed in the health sector prior to becoming a newborn hearing screener (33% as a health professional and 24% in other health areas). The remainder were employed in administration and education (19% and 17% respectively), followed by small proportions working in retail, working in the home or studying.

Figure A5- 10: Experience as a screener



Most of the screeners had between 2 to 3 years (48%) or over 3 years (25%) experience working as a screener.

Finally screeners were asked what improvements could be made to their role. Four themes emerged. These were around:

- better communication – ‘feedback on my performance’, ‘feedback from audiology on how ‘my’ babies are going’
- more time to perform their screening tasks plus the associated administrative work – e.g. ‘having help with the workload’
- more learning and development opportunities – ‘workshops from time to time to keep us motivated’, ‘refreshing the skills I have’, ‘speaking with families that have benefited from having a hearing loss picked up’, ‘more opportunities with a career choice’
- better pay and work conditions – ‘quieter room to screen in’, ‘a salary to reflect the important job we do’.

Appendix 6

Screener interview analysis

The NSU carried out interviews with 11 newborn hearing screeners across four DHBs between September and November 2012. Summary responses from three DHBs are combined as these interviews were conducted close together in a similar manner, and the responses from one DHB, interviewed later by a different person, are reported separately.

Working as a Newborn Hearing Screener

Across the three DHBs, some of the screeners had previously worked from home or in an administrative role, while others were at home with their children. Most were drawn to the screener role because of lifestyle factors such as being part-time and working close to home. Others were attracted to the role as they were keen to work in a health care setting. In terms of job expectations, some did not expect the role to be so intense and busy, with a high level of responsibility. Gaining trust from parents, especially new mothers, was also mentioned as something that they were surprised they needed to do.

Most of the screeners enjoyed their job and liked being part of a team in a hospital environment, working with babies and interacting with parents. They found it satisfying if a baby they screened was later identified with a hearing loss. Areas of dissatisfaction included feeling pressured to fit screening in around the schedules of other medical staff, working in cramped conditions, pay rates, high turn-over of fellow screeners, and having a team leader who is not a screener themselves. Overall the screeners described their role as being busy, but rewarding and interesting.

From the one DHB analysed separately, most screeners had some experience working in the health sector, and a couple had worked in retail prior to becoming a newborn hearing screener. All were interested in the role as it seemed appealing, and for some, they saw it as means to get back into the health sector. For others it was a career change and an opportunity to work with babies. Almost all the screeners did not expect the job to be so intensive, however all of them found it rewarding and fulfilling. All screeners liked the interactive nature of their role, and the responsibility that comes with it. The screeners did not voice any dislikes about their role.

The Screening Process

Across the three DHBs, screeners sometimes felt apprehensive approaching parents as they are aware that new parents may be feeling tired, emotional and busy. Language barriers, and the need to hurry with screening due to parking costs, were also mentioned as stressful. The communication scripts for screeners were viewed as too long, and screeners felt that they sometimes did not have sufficient information to answer all queries from parents.

Screeners found gathering information on risk factors could be confusing, and thought the screening protocol from AOAE to AABR was cumbersome. While generally there was

enough support for screeners when they had questions, sometimes other medical staff were not seen as approachable. The screeners said that they would like more regular feedback on what happens to the babies they screen. Better links across different services (between maternity and audiology for example) would help the screeners to feel more integrated into the hospital system, and the support of midwives was seen as essential but variable.

From the one DHB, screeners generally felt comfortable around parents and were aware that screening happens at a sensitive and emotional time. Initially they found conveying results was sometimes difficult, however with practice, and adhering to the scripts, it became easier. They acknowledged that while the scripts are long, they are helpful because they include all the information for the parents. These screeners expressed no preference between AOAE and AABR, but did mention that changes in risk factors were frustrating. Team work was noted as being essential to their role and they enjoy being part of a team.

Appendix 7

UNHSEIP Well Baby Screening Protocol

