Screening Anomalies in New Born Hearing Screening Programmes in NZ

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New Zealand

20 District Heath Boards in NZ

Auckland DHB

Approx 500,000 pop, 3rd largest DHB in NZ largely metropolitan

9 screeners

Hutt Valley DHB

Approx 140,000 pop

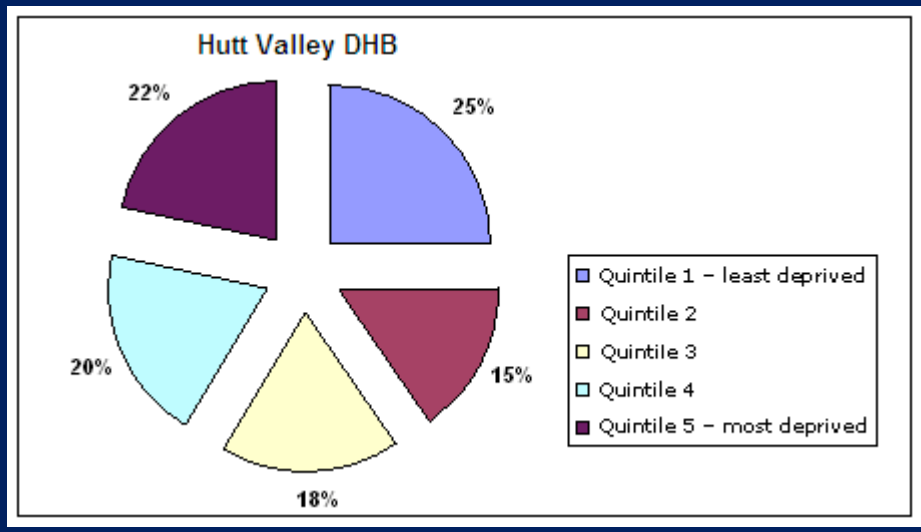
1.7 FTE 3 screeners

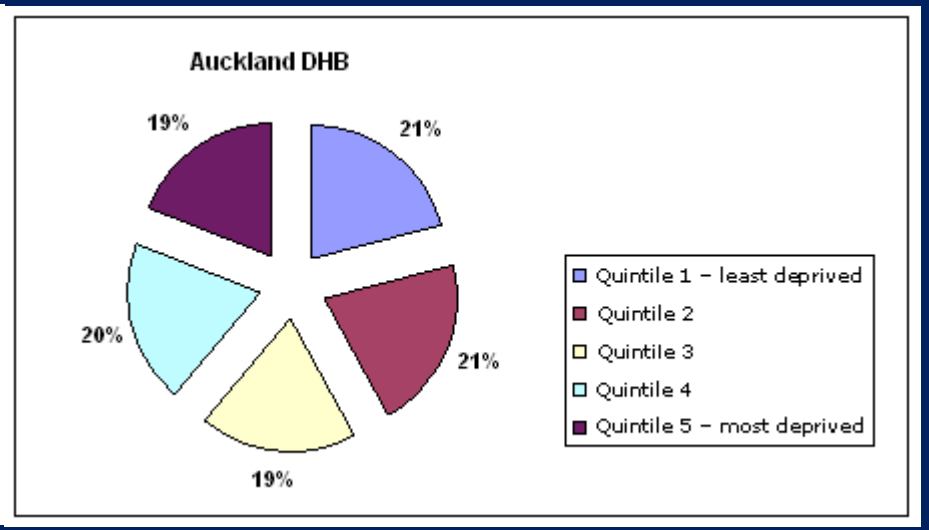
Screening Irregularities in NZ

- Screening was completely rolled out in NZ by early 2010, been underway in some regions for over 6 years
- First irregularity noted in July 2012 at ADHB and then HVDHB
- Occurrence of screening irregularities spread across the range of DHBs in NZ
- Large metropolitan to small rural
- Screening programmes with both large and small staff and included very experienced screeners including trainers

Deprivation Index

- Very similar population mix





Timeline

Suspicion to confirmation

- Call from a midwife to come and complete screening for a family, yet no results recorded
- Family adamant the baby had been screened in one ear and needed the other ear screened
- Family noted the correct screen was performed in a very different manner from how it had been done previously

Screener behaviour

- Rostered herself on to many shifts where she was the only screener present
- Very short time between screens noted on downloads
- Very short times to screen daily lists of babies
- Avoided NICU and almost no AABRs noted on downloads

Initial anomalies noted

- Timing between ears
- Similarity of “frequency print” between daily test of screeners own ear and those of baby

Timing Issues

LAST NAM	FIRST NAI	DATE OF BIRT	IN/OUT	TEST TYPE	DATE	TIME	LOCATION	EXAMINER	EAR	(OVERALL) RESULT	CAL LEVE	CAL RESU	FREQUEN	FREQUEN	FREQUEN	FREQUEN	FR
TEST	CAVITY	01/22/2012	Out	DPOAE	01/22/12	7:44:28		XX	R	Refer	16	0	2000	2500	3200	4000	
TEST	EAR	01/22/2012	Out	DPOAE	01/22/12	7:46:01		XX	R	Pass	15	0	2000	2500	3200	4000	
Baby1		01/20/2012	Out	DPOAE	01/22/12	8:07:40		XX	L	Pass	29	0	2000	2500	3200	4000	
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baby3		01/20/2012	Out	DPOAE	01/22/12	8:41:42		XX	L	Pass	29	0	2000	2500	3200	4000	
baby3		01/20/2012	Out	DPOAE	01/22/12	8:47:35		XX	R	Pass	14	0	2000	2500	3200	4000	
baby4		01/19/2012	Out	DPOAE	01/22/12	11:11:03		XX	L	Pass	15	0	2000	2500	3200	4000	
baby4		01/19/2012	Out	DPOAE	01/22/12	11:13:58		XX	R	Pass	15	0	2000	2500	3200	4000	

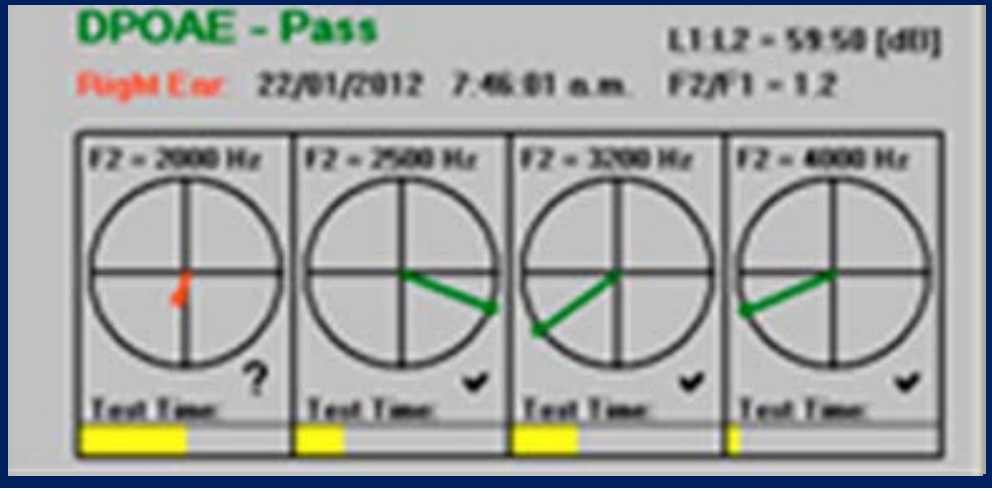
Baby1 screener used baby's ear for left and own ear for right
Baby2 screener used their own ear twice
Baby3 screener used baby's ear for left and own ear for right
Baby4 screener used their own ear twice

Frequency Prints

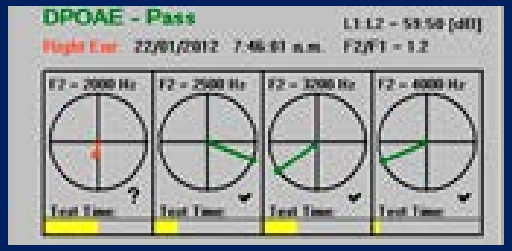
- They are actually a polar plot used to display the results of the relationship between the strength and timing of the response measured from the cochlea to a particular stimulus frequency. It is a representation of the statistical likelihood that an OAE is present in the displayed frequency region.
- If the response is statistically significant the line or vector reaches the circumference of the circle. The vector's length represents amplitude, and its angle reflects the phase or time delay between stimulation and the cochlear response.

- Whereas noise is always randomly distributed and is displayed as a short red line or vector with no direction.

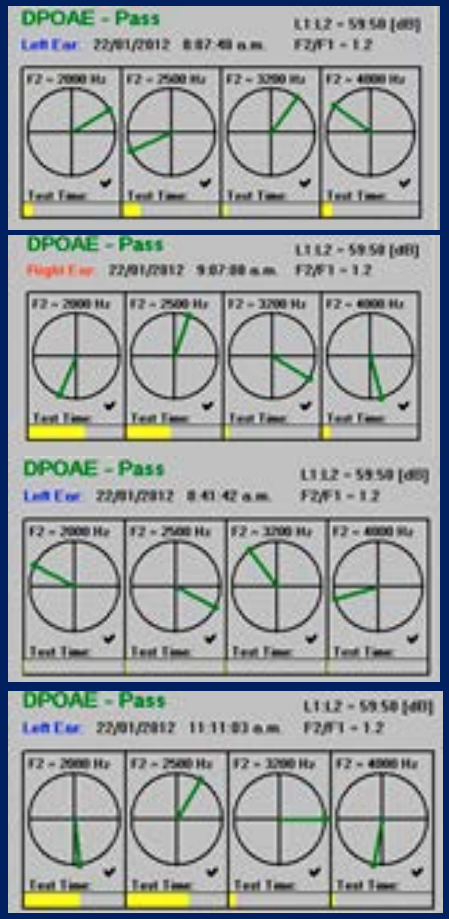
- The Accuscreen manual states the direction of the vectors corresponds to the phase of the distortion product and adds no additional value to the interpretation of the test results.

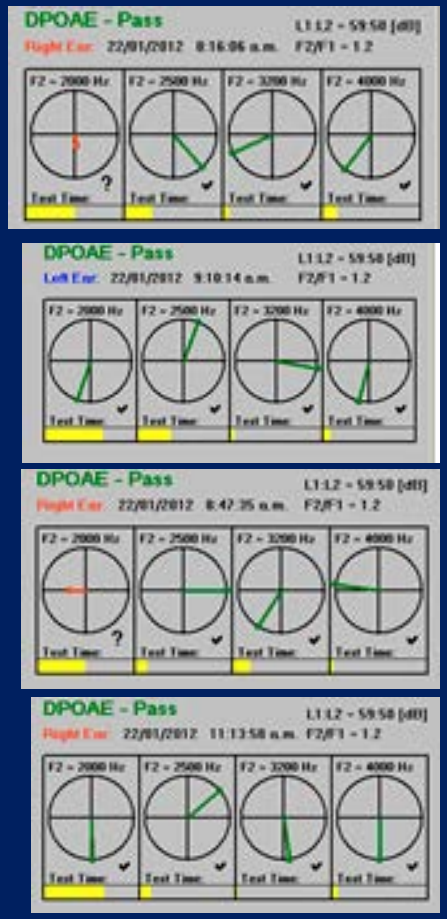


Frequency Prints



Screener's daily ear test





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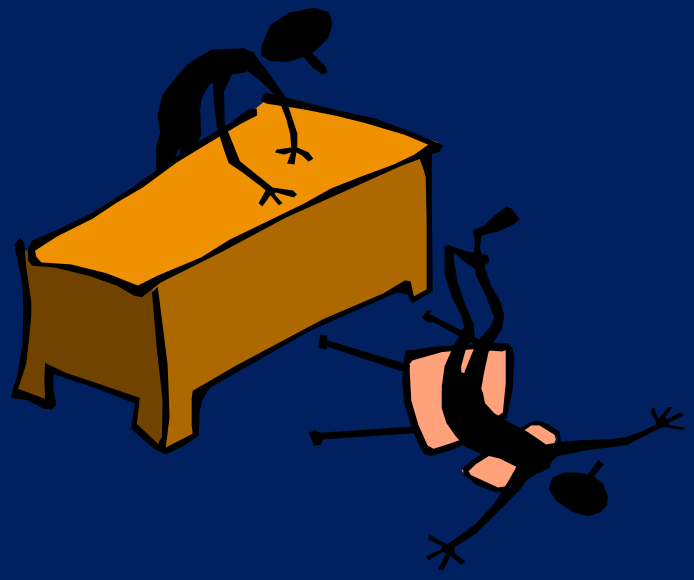
A very bad day

- Lead Screener informs senior team members of her concerns
- Individual screener refer rates calculated



Incidence of OME in newborns

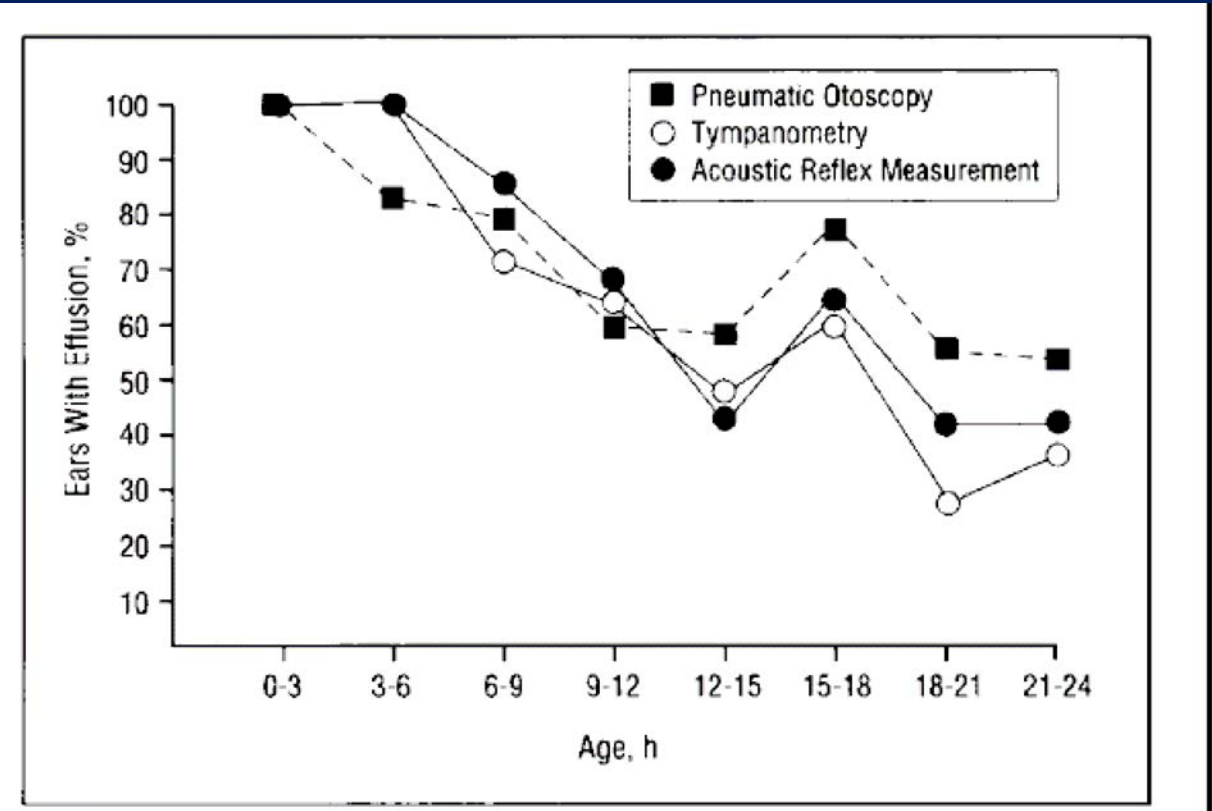


Figure 1. *Percentage of newborn ears with middle ear effusion in the first 24 hours after birth. Each time point represents a different cohort of neonates.*

Resolution of middle ear effusion in newborns. Roberts, Johnson, Carlin, Turczyh, Karnuta Yaffee, 1995.

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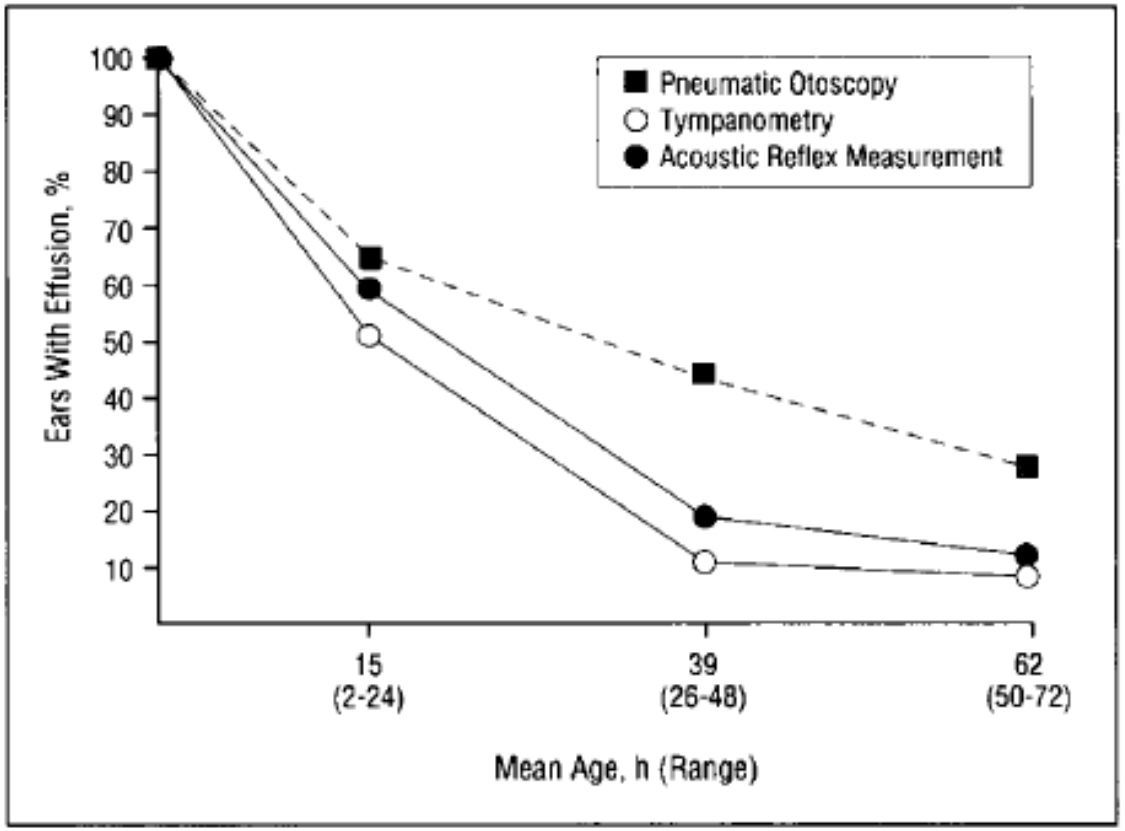
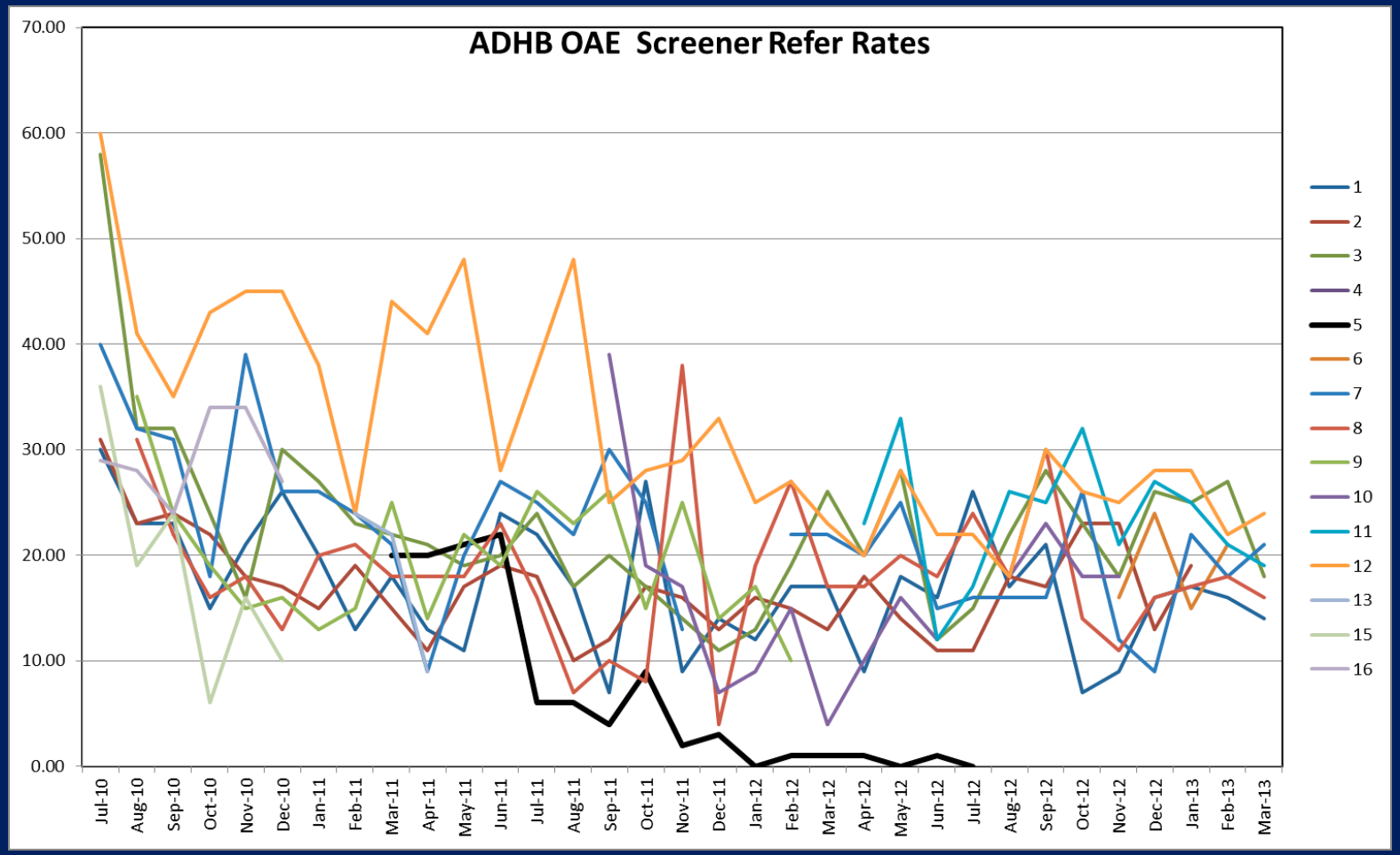


Figure 2. *Percentage of newborn ears with middle ear effusion at three time points after birth. Each point represents the entire cohort of patients evaluated at that time.*

Resolution of middle ear effusion in newborns. Roberts, Johnson, Carlin, Turczyh, Karnuta Yaffee, 1995.

Individual screener refer rates ADHB



Programme OAE refer rates

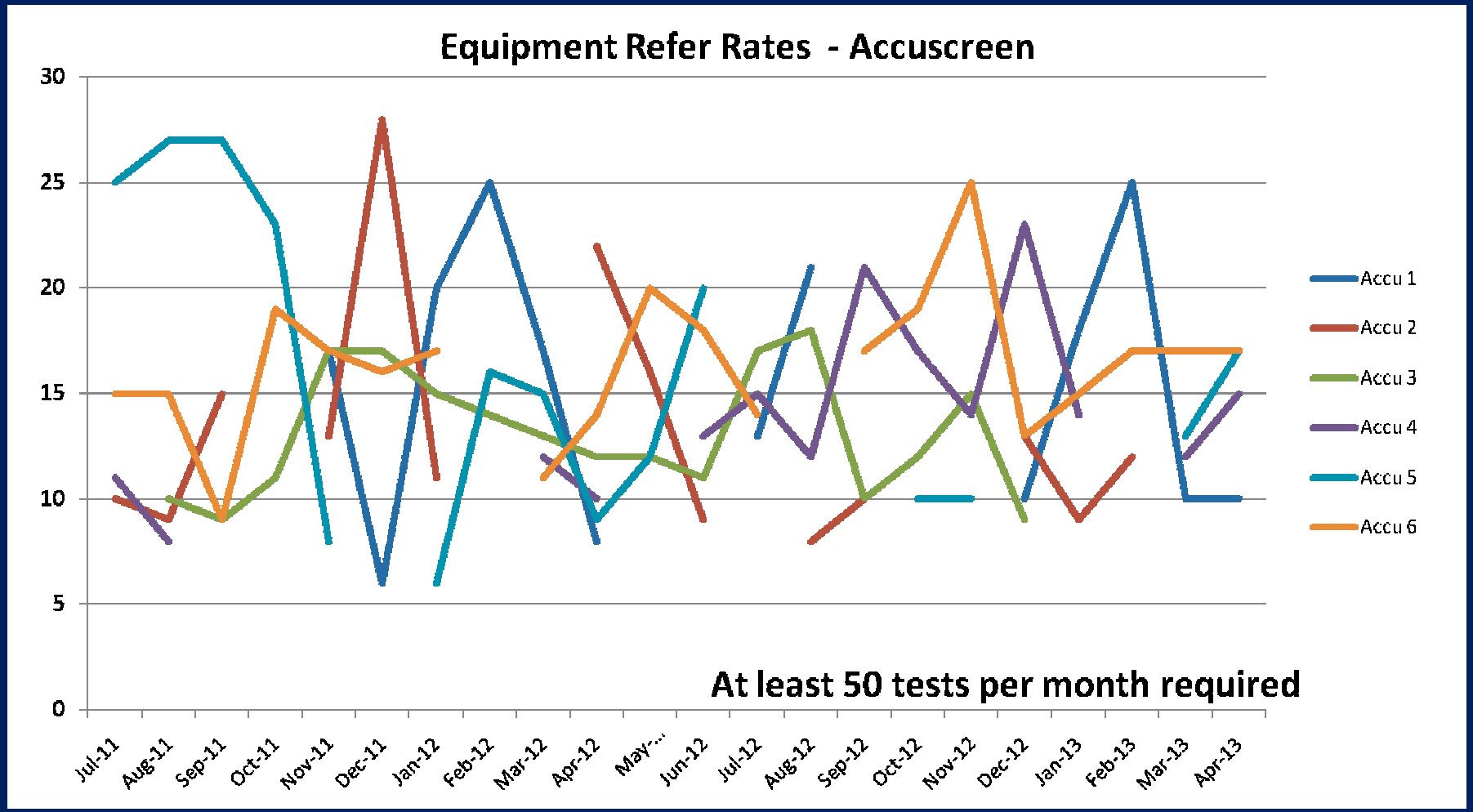
ADHB

- Data from 12,000 screens,
- stable performance 2012 -2013

UNILATERAL RATES only (NZ protocol)

Inpatient Screens	Refer rate	
(87% screens)	14.0%	UK QS<20%
Outpatient Screens		
(13%)	10.4%	UK QS<10%
Overall rate 15.0%		

Equipment refer rates



ADHB Programme AABR refer rates

- Screen 1 4%
- Screen 2 (unilateral and bilateral) 1.5%

Timeline

- ADHB confirms suspicions and notifies NSU and HVDHB
- HVDHB carefully examines their data and finds same pattern in screener refer rates and discovers the usefulness of calibration values in separating adult from infant ear canal volumes

Calibration Issues

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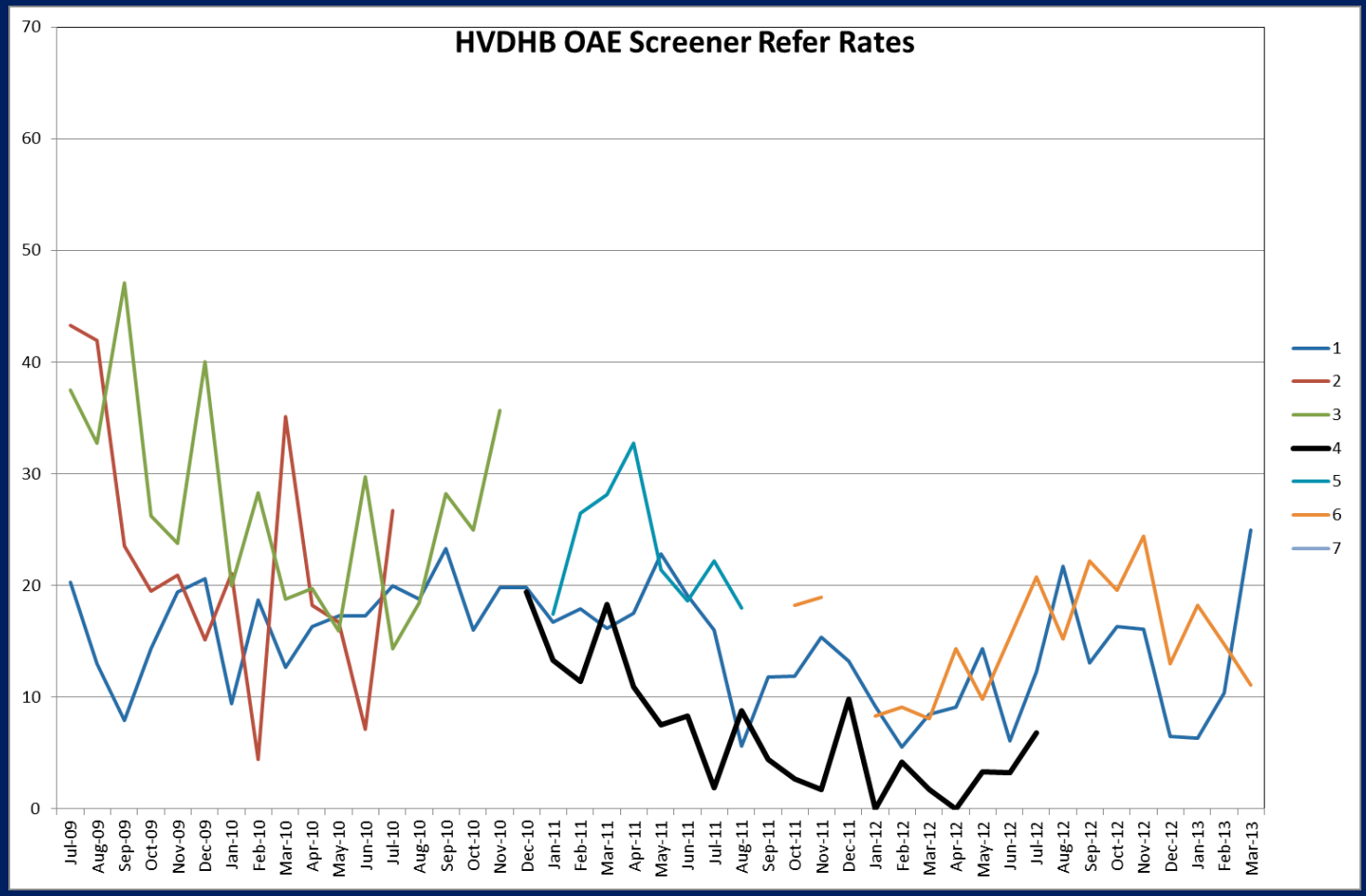
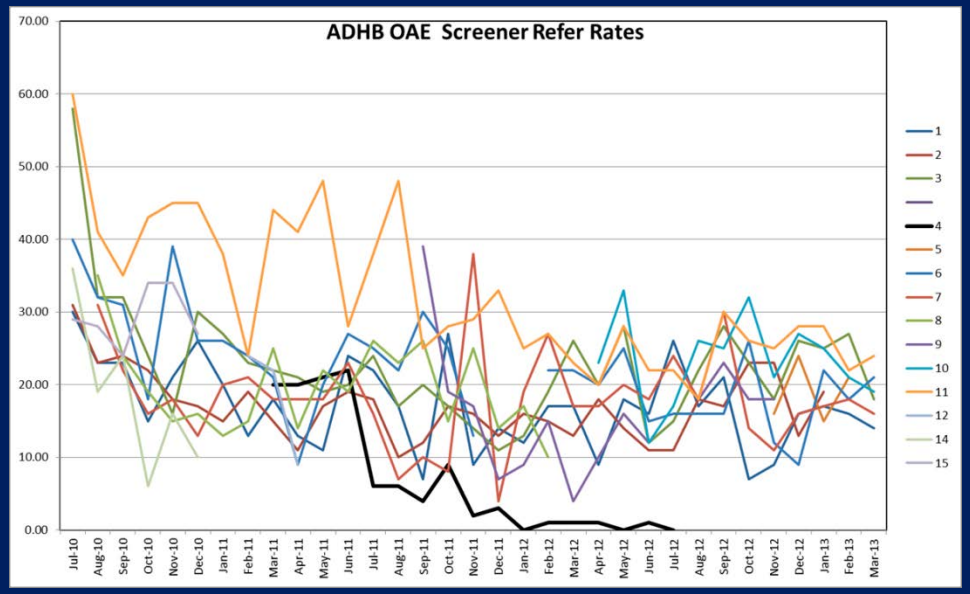
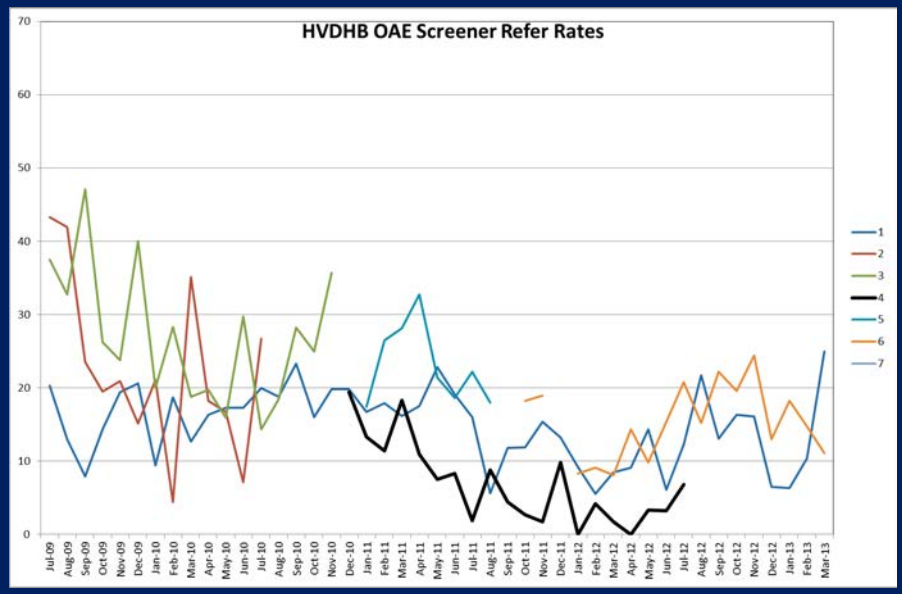
Individual screener refer rates HVDHB



Individual screener refer rates ADHB and HVDHB





Examples of anomalies detected

- Screening own ear once
- Screening own ear twice
- Possibly screening one ear of baby twice

Recall of Babies

- Following ADHB and HVDHB notification of identical issue NSU instructs remaining DHBS to check their own data
- Multiple instances found across the country
- All essentially showing the same pattern of the screener using her own ear
- Affected families offered the opportunity to rescreen their babies

Effect on the families and programmes

- Obviously upsetting and stressful for the affected families
- Also upsetting and stressful for the remaining team members
- Huge amount of work for all concerned in the recall process, including screeners, team leaders, DHB senior management and NSU team members

Other possible anomalies

- Individual DHBs differ in procedures on how recording of births is documented
- Possibility exists for paperwork to be submitted without testing occurring
- Requires crosscheck of every download to every notified birth
  - Not currently occurring

Lessons Learnt

Database Issues

•Comprehensive database essential part of programme management

But

•Had the data

•Didn’t ask the question

So why did it happen?

NSU report postulates various reasons including:

Stress

Adequacy of the screener training

Avoiding AABR

Difficulties in informing families about the OAE results

However this behaviour does encompass the concept of dishonesty as it is not possible to accidently screen your own ear

Honesty/Dishonesty in Medicine

Fred, 2008

…”dishonesty encompasses any form of professional or academic misconduct, including fraud, deceit, cheating, lying, shirking responsibility, abuse of authority, conflicts of interest, plagiarism, **alteration of medical records**, forgery, false representation, and knowingly assisting another person in dishonest acts.”

H.Fred. Dishonesty in Medicine Revisited. Texas Heart Institute Journal 35 (1), 2008

Opportunity

“Personally, I feel people do not "become" dishonest, they have that capability from the outset or they do not. It is simply the opportunity to employ it or not, that happens” Anon

What was a missing link was a well constructed, open, system of management surveillance, this can enhance productivity, efficiency, improve performance

Policy and reasons need to be clear as otherwise this can increase competition and stress

Allen, Coopman and Hart, Workplace Surveillance and Managing Privacy Boundaries. Management Communication Quarterly, 21 (2) 2007.

Surveillance

Strategies to Detect and Prevent Workplace Dishonesty (Hayes, 2008)

Factors Contributing to Workplace Dishonesty:

The perception by employees of a low or non-existent risk of detection and sanction. This attitude may account for much of the variance in the probability that an offending action will occur.

Recommendations

Increased surveillance and training in ethics

"Training people how to apply core ethical principles in changing environments is a cornerstone of developing effective, creative and flexible workforces that emerge into effective, creative and flexible organisations"

Workplace dishonesty. Jim Bright. Living Ethics: issue 88, 2012