Universal Newborn Hearing Screening: 
*The Good Model*

Moderator: Pr Hung THAI-VAN, France
Every panelist

Check which if any of the following hearing screenings are mandated by law in your country:

☐ Newborns
☐ Later in the 1st year
☐ At-risk

If yes, please specify when the legislation passed: (year)
Every panelist

Give for your country a percentage of professionals who perform the hearing screening from all persons who perform the hearing screening.

- Physicians: ___ %
- Audiologists/audiological staff: __ %
- Nurses: ___ %
- Midwifes: ___ %
- Community health workers: ___ %
- Others: ___ % (please specify__)

The numbers need to be 100% in sum
Give for your country a percentage of places where the screening is done from all screening places.

- Birthing facilities: ____ %
- Home: ____%
- Other outpatient places: ____%

Which place? _____

The numbers need to be 100% in sum
Percentage of birthing facilities in your country performing a hearing screening from all birth facilities:

....% of ... (number of birthing facilities)
Universal Newborn Hearing Screening (UNHS)
Epidemiological Background

Sensorineural hearing loss is the most frequent sensory deficit in humans

- Moderate to profound HL: 0.8%
- Mild to profound HL: 1.2%
- Moderate HL 57%, Severe 17%, Profound 26%

Fortum et al., 2001
Percentage of babies or infants born in your hospital/birthing clinic last year who underwent a hearing screening

- At all ... % of ... (number of life births)
- Universal Newborn Hearing Screening (UNHS): ... % of ...(number of life births)
- Later screening in the 1st year of life: ...%
- Targeted screening of babies at risk: ...%
Percentage of infants born last year (or in the reporting year) in your hospital/birthing clinic who needed a diagnostic audiological evaluation:
___% of _____ (number of born babies)
Percentage of infants born last year (or in the reporting year) in your hospital/birthing clinic who **received a diagnostic audiological evaluation**: 
___% of _____(number of born babies)
Maturation of the Auditory System

- Inner ear is mature as soon as the 7th month in utero
  - Sound-induced movements and changes in cardiac rhythm

- Maturation of brainstem afferent auditory pathway up to the age of 2
  - Myelination
  - Cortical organization
Available Screening Tools

Auditory Brainstem Responses

Otoacoustic emissions
Otoacoustic Emissions: TEOAE/DPOAE

- Probe
- Probe Tube
- Tip
Transient evoked otoacoustic emissions

Assessing OHCs in vivo

Otoacoustic emissions
Automated Auditory Brainstem Responses (AABR) with disposable recording electrodes
AABR with no consumables
Feasibility of AABR in very premature babies

Elongated vertex electrode useable as soon as 30 weeks gestation time
Every panelist

What method are you using to do hearing screening?

- OAE alone: …. % of …. (number of screened babies)
- AABR alone: … %
- 2-stage OAE-AABR screening: … %

Please be aware: 2-stage means that you at first screen with one method (most often TEOAE), and only in case of a failed screening with another one (most often AABR). If you have such a screening for let’s say 100 percent of babies and 90 pass an OAE screening and do not need an AABR, and the remaining 10% babies undergo an additional AABR-screening, you have a 100% 2-stage OAE-AABR screening and 0% OAE alone screening (and not a 90% OAE alone screening and a 10% 2-stage OAE-AABR screening)
Weighting the Pros and Cons

OAE

► Quick, but very sensitive to ambient noise levels
► Twice as many false positives compared to automated ABR
► Not recommended in NICU (prevalence of auditory neuropathy 1.96%)

AUTOMATED ABR

► Test for HL of cochlear and retrocochlear origin
► Cannot diagnose neural dyssynchrony (conventional ABR still needed)
► Informative about auditory system maturation
Proportion of infants born last year (or the reporting year) in your country who were identified with a Permanent Childhood Hearing Loss (PCHL)* from all born babies including late identified cases (=prevalence for a one year cohort):

… per 1000 of …….. (number of born babies)

*PCHL includes unilateral or bilateral permanent hearing loss, which has been confirmed through a battery of audiometric tests that result in hearing loss detection at the better ear and averaged over frequencies 0.5, 1, 2, and 4 kHz greater than 20 dB HL
Percentage of infants with a permanent childhood hearing loss (PCHL) born last year (or in the reporting year) in your country who **received intervention** from all babies diagnosed with PCHL:

___ % of _________(number of babies with PCHL)

*Intervention may include (but is not limited to) fitting with hearing devices, speech-language therapy, early intervention programming by a parent-infant specialist, medical or surgical treatment, etc. In cases where it is unclear whether treatment is required, further monitoring also counts as intervention*
Percentage of infants with PHCL born last year (or in the reporting year) in your country who received intervention before 6 months of age from all babies receiving intervention: \[ \% \text{ of } \text{(number of babies who received intervention)} \]

* Intervention may include (but is not limited to) fitting with hearing devices, speech-language therapy, early intervention programing by a parent-infant specialist, medical or surgical treatment, etc. In cases where it is unclear whether treatment is required, further monitoring also counts as intervention.
Thank you!