

Developing community-based infant hearing screening in the Western Cape



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Newborn hearing screening has not been legislated or mandated in South Africa, although awareness of early detection and intervention has increased.

National surveys in the private and public healthcare sectors revealed that approximately 90% of newborns in South Africa have no prospect of having their hearing screened.¹ Only 7.5% of hospitals in the public sector offer some form of screening, with universal newborn hearing screening being offered by less than 1% of units.² The reported age of initial diagnosis ranges from 23 to 42 months in different studies.

Our NGO

The Carel du Toit Centre is a Cape Town-based nongovernmental organisation (NGO) that supports and provides services to children with hearing loss and their families, through an early intervention programme and a school for learners aged three to 10 years.

Having witnessed on numerous occasions the consequences of late diagnosis of hearing loss, the Centre initiated a community outreach infant screening programme in 2001, by providing daily screening services at the Nolungile clinic in Khayelitsha, one of Cape Town's biggest townships. To this day, the team screens on average 100 infants per month.

Following this project, the Centre felt compelled to reach more infants and initiated a pilot programme on a larger scale.

Combining hearing screening with infant immunisations

Why this pilot programme?

As a significant number of births in South Africa take place outside of hospitals, either at home or at birthing clinics, and those born in public hospitals are often discharged on the same day, a community-based approach to infant hearing screening is necessary.

Immunisation clinics seemed suitable as a platform for screening because they are well attended and the first immunisation visit take place at 6 weeks of age.

Mothers wait for their newborns to be tested.

SOUTH AFRICA



Partnership

A proposal was brought forward to perform the hearing screening and a partnership was formed with the City of Cape Town's Health Department (municipal health system) that manages the immunisation clinics. Eight primary healthcare (PHC) clinics were selected for piloting hearing screening in 2007.

The City of Cape Town committed to purchase and maintain the eight otoacoustic emissions (OAE) devices whilst our NGO provided the managing audiologist and covered operational expenses.

This was the first systematic government-supported infant hearing screening programme.

Protocol

Fully automated handheld DPOAE (distortion product OAE) devices were selected for screening, as they are easy to use by non-specialists and require no interpretation.

The managing audiologist trained existing nursing personnel to perform the hearing screening in conjunction with their immunisation duties. They provided theoretical as well as practical in-service training to nursing staff and visited each site on a bi-weekly basis to provide ongoing support and mentoring.

Referral and follow-up

A two-stage screening protocol was implemented. The first hearing screening was performed during the immunisation visit scheduled at six weeks of age. Infants who failed the screen were scheduled for a follow-up screen within four weeks (coinciding with their next planned immunisation visit).

For the sake of cost-effectiveness, children were referred only when they failed the OAE screen in both ears. Although we do not disregard the impact of unilateral hearing loss, we made this decision due to resource constraints in terms of follow-up at both clinic and tertiary hospital level.

Infants who failed both the initial and the follow-up screen were referred to the tertiary hospital for a diagnosis. In an attempt to speed up the diagnostic process, we negotiated one fixed appointment per week with the audiology department, for babies referred through the programme. Unfortunately, even with this in place, waiting time for an appointment often ranged between three and six months.

Assessing results

The screening programme was introduced in three phases (two to three clinics per six-month period) and the programme was closely monitored. Results and feedback from each phase informed the roll-out of the next phase. For example, we found that training needed to be repeated whenever staff rotations or changes took place, which could be as often as every three months.

Research evaluating the efficacy of the screening programme reported low coverage rates: only around 30% of immunised infants were screened for hearing

loss. This was mainly attributed to the use of already burdened nursing staff as screeners.³ In total the programme reaches between 2,000 and 2,500 infants per annum.

With the aim to optimise screening coverage and cost-effectiveness, we developed a new model for community-based infant hearing screening.

Combining hearing screening with postnatal visits at birthing units

Why this pilot programme?

Midwife obstetric units (MOUs) are birthing units run by midwives in the community for primary healthcare patients. Although mother and baby are usually discharged six hours after birth if they are in good health, they return to the MOU for postnatal follow-ups focussing on navel care and feeding advice. These postnatal visits take place every second day until the umbilical cord falls off. They seemed an ideal platform for hearing screening as the babies would be younger and there would be two to five screening opportunities before the infant reached the age of two weeks.

Partnership

The MOUs fall under the management of the Western Cape Government: Health (WCGH), so a new partnership had to be established. A pilot programme was initiated in 2012 in all three MOUs within the Klipfontein/Mitchell's Plain sub-structure.

Protocol

Two different models of service delivery were used:

- **Training existing personnel:** at the two medium-sized MOUs, the personnel involved in the postnatal visits were trained to perform OAE hearing screening as part of the standard visit.
- **Using a dedicated screener:** in the third facility, which was the largest MOU with double the amount of births and postnatal visits, a dedicated screener was appointed. Infants were seen for their postnatal visit and then sent over to the screener who performed the hearing test.

Prior to initiating hearing screening at each MOU, staff information sessions were held to introduce the concept of early hearing loss detection and to explain the implementation plan. A mother and child with hearing loss, from the area, were invited to share their story. This greatly influenced staff attitudes.

After a few weeks the screener reported that some mothers treated her with disrespect and we realised that she needed a uniform. Once she was in uniform, the mothers viewed the screener and the service as official and a change in attitudes was experienced.

Referral and follow-up

A two-stage screening protocol was used at all the MOUs: infants failing the initial screen were re-screened at their next postnatal visit, usually two days later. Those who failed the second screen were sent to the tertiary hospital.

A research study was also launched at the third MOU, comparing the outcomes of DPOAE and AABR screening, to see if the latter could be used in a community-based setting (AABR produces fewer

false positives, and therefore fewer referrals, which is important when services are overburdened).

Results

This new model rendered excellent results, yielding high coverage and follow-up rates.

At the two medium-sized MOUs, staff managed to integrate the hearing screening and felt that it added value to the postnatal visits.

At the large MOU, the dedicated screener was essential to run the service and could cope with the added administrative tasks of follow-up management and electronic data capturing.

The research showcased the viability of AABR screening in community-based contexts with the benefits of reduced disposable costs (due to the technology's built-in fixed electrodes) and lower hospital referral rates (1%).

The three MOU facilities now screen between 10,000 and 11,000 infants per annum.

The way forward

Although the MOU pilot project was a success, long waiting lists at tertiary level highlighted the dire need for better access to hearing and speech services to support infants with hearing loss.

To this end, the Child Speech and Hearing Project was formed: this three-way partnership between the WCGH, the Children's Hospital Trust and the Carel du Toit Centre offers children (and their families) access to hearing and speech services within the District Health System.

Newly developed speech and hearing packages of care (including newborn hearing screening), for children aged 0–6 years, will be demonstrated over a two-and-a-half-year period in the pilot sub-district.



Performing a hearing test at a midwife obstetric unit.

SOUTH AFRICA

¹ ME Meyer, D Swanepoel, T Le Roux, M Van der Linde. Early detection of infant hearing loss in the private health sector of South Africa. *Int. J. Pediatr. Otorhinolaryngol.* 76 (2012) 698–703.

² M Theunissen, D Swanepoel. Early hearing detection and intervention services in the public health sector of South Africa. *Int. J. Audiol.* 47 (2008) S23–S29.

³ N Friderichs, D Swanepoel, JW Hall. Efficacy of a community-based infant hearing screening program utilizing existing clinic personnel in Western Cape, South Africa. *Int. J. Pediatr. Otorhinolaryngol.* 76 (2012) 552–559.

KEY LESSONS

- Pilot programmes are crucial in developing efficient and contextually appropriate models for infant hearing screening.
- Using evidence-based research strengthens programme credibility and helps to advocate for further roll-out.
- Building relationships and trust takes time: persevere.
- If an NGO is taking the lead, it is essential to get buy-in from all partners and for government to take some form of responsibility. This greatly impacts on sustainability.
- Follow a phased approach in the roll-out of new services: plan, implement, evaluate, optimise, and learn from the experience. Then move on to the next phase.
- Appoint a programme manager who will monitor quality and provide ongoing support and training.
- Implementation and training are not to be seen as one-off occurrences.
- Embed your early hearing detection and intervention programme within the existing healthcare system: this ensures greater sustainability and cost-effectiveness.