

HOLD MY HAND  
POLICY BRIEF SERIES

# Every child heard

Why South Africa must implement  
universal newborn hearing screening now

DECEMBER 2025 ■

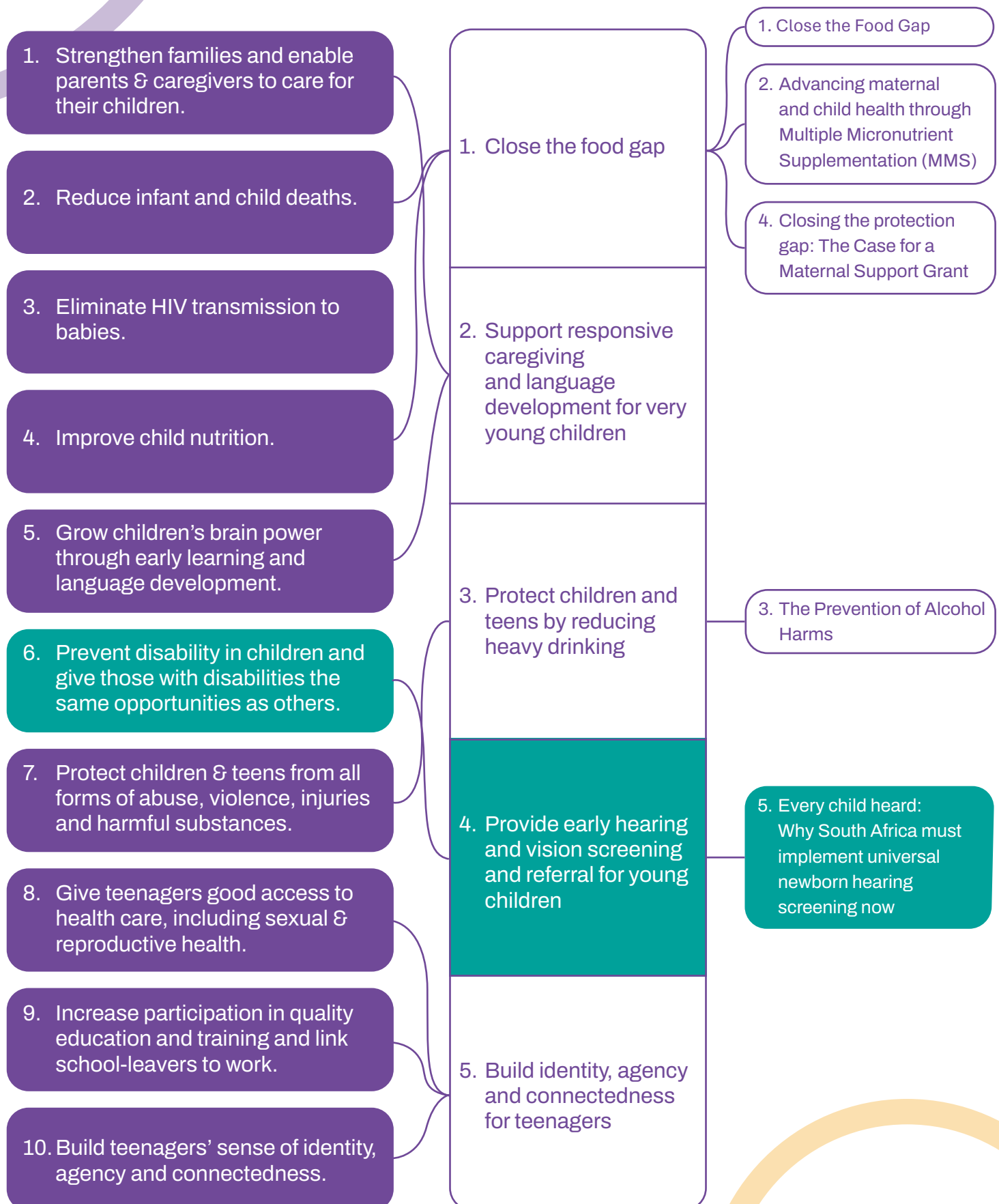


# NSAAC's ten priorities to accelerate progress for children and teenagers

## The Accelerators

Five Initial Strategies

## Policy Briefs





## Hold My Hand Accelerator

Every day, 3 000 children are born in South Africa, 1 million every year, and their childhood experiences will shape both their future and the nation's. Ensuring they thrive would unlock massive opportunities – a stronger economy and a safer, happier society. Global experience shows that progress accelerates when the President leads, society unites behind a national programme for children, and a dedicated, energetic organisation drives action. This is the logic behind the National Strategy to Accelerate Action for Children (NSAAC), led by the Presidency and the Department of Social Development. The Strategy identifies 10 key priorities and calls for broad partnerships across government, civil society, trade unions and the private sector.

A key mechanism is the Accelerator for Children and Teens, established through a partnership between the Presidency and DGMT. It fast-tracks critical strategies that require public-private collaboration, focusing on closing the food gap, supporting responsive caregiving and language development for very young children, protecting children and teens by reducing heavy drinking, providing early hearing and vision screenings and referrals for young children and building identity, agency and connectedness for teenagers.

A series of policy briefs is being developed to support this work.

# POLICY BRIEF SERIES



## Key Messages

- Early detection of hearing loss is essential for healthy child development and overall public health.
- Around 6 000 infants (~17 per day) are born with hearing loss in South Africa each year.
- Fewer than 10% of newborns receive hearing screening in South Africa, with access especially limited in the public sector.
- In South Africa, most children with hearing loss are identified late (often after 20 to 30 months), missing the critical window for language, psychosocial, emotional and cognitive development in keeping with the 1 to 6-month intervention window. Reported ages of diagnosis range from 11 to 52 months across different studies.<sup>1</sup>
- The World Health Organization, Joint Committee on Infant Hearing, and the Health Professions Council of South Africa endorse the 1-3-6 benchmarks – all newborns should be screened by 1 month, diagnosed by 3 months if needed, and enrolled in intervention services by 6 months.
- A national Early Hearing Detection and Intervention (EHDI) programme is feasible and cost-effective when integrated into routine maternal and child health services.
- Inaction is costly: the lifetime economic burden of one annual birth cohort of unidentified infant hearing loss is estimated at R68.6 billion (about R1 billion per year of life).
- An EHDI programme aligns with National Health Insurance priorities and supports better educational and employment outcomes.

## Acronyms

<b>AABR</b>	Automated Auditory Brainstem Response
<b>DHIS</b>	District Health Information System
<b>DHIS2</b>	District Health Information Software 2
<b>EHDI</b>	Early Hearing Detection and Intervention
<b>HPCSA</b>	Health Professions Council of South Africa
<b>JCIH</b>	Joint Committee on Infant Hearing
<b>NHI</b>	National Health Insurance
<b>OAE</b>	Otoacoustic Emissions
<b>QALY</b>	Quality-Adjusted Life Year
<b>UNHS</b>	Universal Newborn Hearing Screening
<b>WHO</b>	World Health Organization

## Executive summary

According to the World Health Organization's (WHO) World Report on Hearing – the first global report of its kind – over 430 million people worldwide live with moderate-to-profound hearing loss, including 34 million children.<sup>2</sup> About 80% live in low- and middle-income countries.<sup>3</sup> The report estimates the annual global cost of unaddressed hearing loss at nearly US\$1 trillion, and identifies universal newborn hearing screening (UNHS) as a cornerstone intervention supported by strong evidence of cost-effectiveness.<sup>4</sup>

In South Africa, more than one million babies are born each year, yet fewer than 10% receive a hearing screening at birth.<sup>5</sup> In the public sector, which serves approximately 85% of the population, screening is primarily limited to high-risk infants in neonatal intensive care units (NICUs).<sup>6</sup> Only 7.5% of hospitals offer any newborn hearing screening, and fewer than 1% provide universal coverage.<sup>7</sup> Private hospitals often provide screening, but coverage is inconsistent. As a result, over 90% of newborns are missed, and many children are diagnosed only after 30 months – far beyond the critical 1 to 6-month window for early intervention, which aligns with the period of optimal brain plasticity for language, psychosocial, emotional, and cognitive development.<sup>8,9</sup>

Although the Department of Health has discussed an Early Hearing Detection and Intervention (EHDI) programme since 2021, no national policy has yet been adopted.<sup>10</sup> This policy brief calls for urgent action to establish a national EHDI programme, embedded within maternal and child services in the public health system. Screening should ideally be offered before newborns are discharged from hospitals, midwife obstetric units (MOUs), or community health centres and clinics. This is often impractical, however, as healthy babies are usually discharged within six hours of birth. More importantly, universal screening should be integrated into routine postnatal and immunisation visits. The programme can be delivered by trained screeners, supported by audiologists who provide training, oversight, diagnostic testing, and referral to family-centred early-intervention services.<sup>11</sup> A comprehensive package of family-centred support is key to coordinating information and services across the child's care pathway.

Additionally, routine indicators should be captured in the District Health Information System (DHIS).<sup>12</sup> However, because DHIS only captures aggregate data, a patient-level information system is needed to ensure referrals are made, follow-up is tracked, and outcomes are monitored across all levels of care from home-based, primary, district and tertiary hospitals, and across provinces and both sectors.

A phased rollout, beginning in National Health Insurance (NHI) pilot districts and areas with existing audiology capacity, will allow South Africa to scale sustainably. Public-private collaboration will also be essential to expand coverage, share expertise, and mobilise resources.

South Africa has the tools, pilot experience, and global evidence to act. Established programmes in countries such as China<sup>13</sup> and Australia<sup>14</sup> demonstrate the feasibility and benefits of UNHS, showing both improved outcomes and strong economic returns. A national EHDI programme is a smart, equitable, and cost-saving investment in South Africa's future – ensuring that no child with hearing loss is left behind.

## 1. Introduction

Newborn hearing screening supports early language, cognitive, and social development.<sup>15</sup> Without it, hearing loss is typically diagnosed only after developmental delays become visible – often after 30 months of age.<sup>16</sup> Because hearing loss is an “invisible” condition, it can easily go unnoticed in the early months of life – making universal screening essential.

The WHO recommends that newborns be screened by 1 month, diagnosed by 3 months, and enrolled in intervention services by 6 months.<sup>17</sup> Similar targets have been suggested for South Africa, allowing for interim goals of 1, 4, and 8 months for community-based implementations.<sup>18</sup>



Source: Centers for Disease Control <sup>19</sup>

The WHO World Report on Hearing underscores both the global scale and the economic cost of unaddressed hearing loss, identifying UNHS as a cornerstone intervention.<sup>20</sup> For South Africa, this evidence reinforces the urgency of embedding EHDI within the public health system.

Hearing loss is among the most common disabilities worldwide and represents a growing public health concern. Globally, around 1 to 2 in every 1 000 babies are born with severe or profound permanent hearing loss in both ears.<sup>21</sup> A further 1 to 2 per 1 000 experience milder bilateral loss or unilateral hearing loss.<sup>22</sup> Causes include both avoidable and genetic factors – such as congenital infections during pregnancy (for example, rubella or cytomegalovirus), hereditary predispositions, and craniofacial abnormalities.<sup>23</sup> Other contributing factors include birth complications (such as prematurity or oxygen deprivation), neonatal jaundice, and exposure to ototoxic medications (for example, gentamicin) when safer alternatives are available.<sup>24</sup> South African studies also confirm that low birth weight, preterm birth and use of ototoxic drugs are among the most frequent risk factors for infant hearing loss.<sup>25</sup>



Importantly, around half of all babies with severe hearing loss are born without any identifiable risk factors.<sup>26</sup> A global survey covering 158 countries found that only 33% reported screening more than 85% of newborns.<sup>27</sup>

In South Africa, the incidence is higher – estimated at 3 per 1 000 births in the private sector and 6 per 1 000 in the public sector.<sup>28</sup> This translates to approximately 6 100 affected infants each year (circa 2009 estimates).<sup>29</sup> Yet around 90% of newborns in South Africa are not screened.<sup>30</sup> Only 7.5% of public hospitals offer any hearing screening, and fewer than 1% provide universal coverage.<sup>31</sup>

The impact is serious. Hearing loss in infancy affects not only speech and language but also overall development, literacy, future employment, and the quality of life for both the child and their family.<sup>32</sup> It also changes how caregivers and children communicate, placing emotional, social, and financial pressures on families and widening developmental ripple effects beyond the individual child.<sup>33</sup> The first six months are critical for speech and language development: for every month that diagnosis is delayed, children experience measurable setbacks in both understanding and using language.<sup>34</sup>

When hearing loss goes undetected, its effects extend far beyond the ability to hear. During the first year of life, the brain rapidly forms pathways linking hearing, speech, and learning. Without access to sound during this period, neural development slows in regions responsible for language and communication, triggering a chain reaction that affects school performance, future learning and employment opportunities, and even long-term reliance on social-support systems. These cascading effects highlight why early detection and timely intervention are so critical.<sup>35</sup>

## 2. Gaps in the current system

South Africa lacks a national EHDI programme, resulting in fragmented service delivery and missed opportunities for early care. Key challenges include:

### Policy and governance

- **No mandated requirement:** Despite international conventions protecting children's rights to language, health and development,<sup>36</sup> South Africa still has no government mandate or policy establishing a national EHDI programme.<sup>37</sup>
- **Weak monitoring and evaluation:** Data collection is fragmented and inconsistent, often managed at local rather than national level.<sup>38</sup> Routine monitoring is essential to track coverage, quality, and follow-up, intervention, and outcomes.<sup>39</sup>

### Coverage and access

- **Limited coverage:** UNHS is rare in public hospitals and clinics.<sup>40</sup> Some private providers have introduced UNHS,<sup>41</sup> but coverage and information remain limited.<sup>42</sup> Despite the Health Professions Council of South Africa's (HPCSA) 2018 guidelines endorsing UNHS in all birthing facilities, implementation remains limited to isolated pilots and programmes.<sup>43</sup>

- **Missed diagnoses:** Risk-based screening misses around half of all infants with hearing loss, since many affected babies have no identifiable risk factors.<sup>44</sup>
- **Loss to follow-up:** Without a patient-level information system, many babies are lost between screening, referral, and intervention, especially across provinces and sectors.<sup>45</sup> Follow-up challenges are compounded by limited access to diagnostic services and long waiting lists; when families must travel long distances or wait months for appointments, many never complete the referral process.<sup>46</sup>

### Awareness, equipment constraints and human resources

- **Barriers to early identification:** Many children are referred only after speech or language delays become apparent.<sup>47</sup> Low awareness among caregivers and stigma further hinder early identification and follow-up<sup>48, 49</sup> – a problem often compounded when caregivers' concerns are overlooked or dismissed. Findings from the South African HI HOPES cohort study show that even after parents first suspect a hearing problem, diagnosis may be delayed by up to a year – particularly in the public sector – because their concerns are de-prioritised.<sup>50</sup>
- **Equipment and maintenance:** Access to screening and diagnostic equipment remains uneven across facilities, with many clinics and hospitals lacking functioning devices. Even where equipment is available, regular calibration, repair, and replacement are rarely budgeted for, resulting in downtime and unreliable results. Without a clear, costed national system for equipment maintenance, universal coverage and continuity of care cannot be achieved.<sup>51</sup>
- **Shortage of trained staff:** Health care personnel – including community health workers – can be trained as designated screeners to expand coverage, provided they receive audiological supervision. Programmatic success depends on strategically integrating EHDI services within the broader health system to strengthen resources, streamline referral pathways, and ensure timely early intervention.<sup>52, 53</sup>

Table 1: Registered speech, language and hearing professionals in South Africa, 2024

Speech, language and hearing professions	
Audiometrician	4
Audiologist	1 035
Hearing aid acoustician	117
Supplementary audiologist	1
Community speech and hearing worker	5
Speech and hearing correctionist	3
Speech and hearing assistant	2
Supplementary speech therapist and audiologist	1
Speech therapist	1 669
Speech therapist and audiologist	1 561
Speech therapy assistant	1
<b>Total</b>	<b>4 403</b>

Source: HPCSA<sup>54</sup>



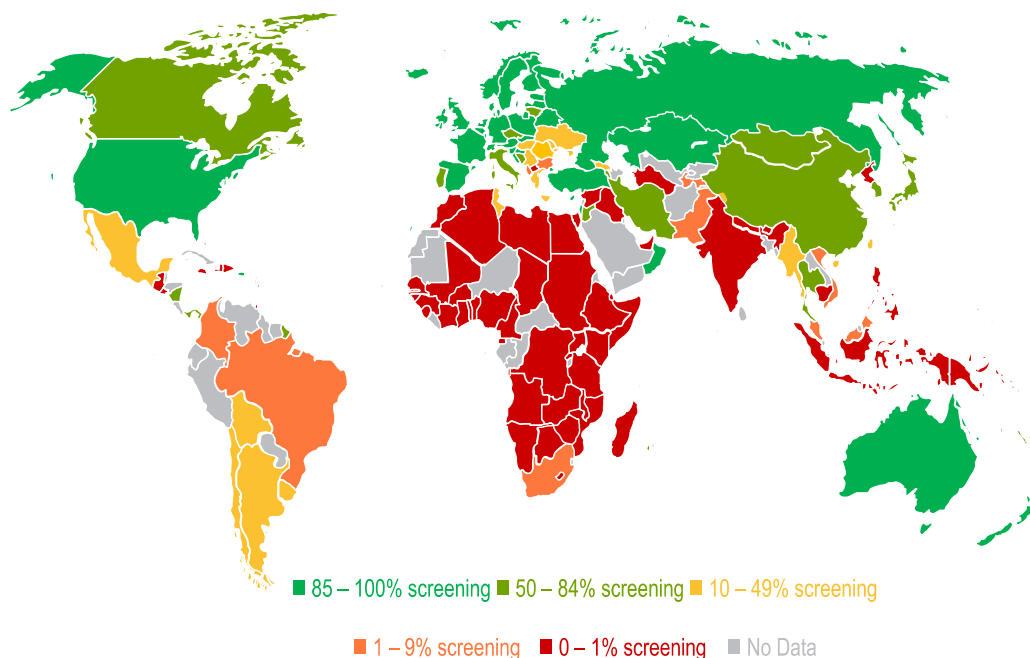
### 3. International examples

Countries with national frameworks and mandatory policies<sup>i</sup> consistently show higher coverage and earlier identification, thereby reducing long-term impacts.<sup>55</sup>

- **United Kingdom:** Operates a long-standing UNHS programme that meets international “1-3-6” benchmarks. Its national information system tracks outcomes and ensures accountability, achieving 98% coverage of all newborns.<sup>56</sup>
- **Brazil:** Mobile screening units and public-private collaboration models have expanded reach to 75% coverage nationally.<sup>57</sup>
- **China:** Implemented a nationwide phased rollout (2001 to 2020) backed by strong government policy and dedicated funding, achieved a 94.3% coverage and markedly improved early identification rates.<sup>58</sup>
- **Australia:** The 2025 National Framework for Newborn Hearing Screening enshrines equitable access as a guiding principle, adopts the international 1-3-6 benchmarks (with high-performing areas encouraged to aim for “1-2-3”), and applies National Performance Indicators to drive accountability.<sup>59</sup> Screening is positioned as the gateway to a full continuum of care, from diagnosis through to intervention.<sup>60</sup>

These examples illustrate that with clear policy direction, sustained investment, coordinated programme management, strong accountability, and robust data systems, countries can deliver EHDi at scale – improving both developmental and economic outcomes.

Figure 1: Country-specific coverage of newborn hearing screening programmes (reporting years range from 2008-2018)



Source: International Newborn and Infant Hearing Screening Group<sup>61</sup>

<sup>i</sup> “Mandatory” refers to establishing a universally accessible, centrally organised newborn hearing screening system, supported by comprehensive education for families on the importance of early hearing detection. This is not about legal enforcement but rather about creating a framework that encourages informed parental participation and ensures equitable access to early intervention for all children

## 4. Evidence from South African case studies

Multiple initiatives across South Africa show that EHDI is feasible in both rural and urban settings, but also highlight challenges in follow-up, staffing, and resources.

Location / Pilot	Key findings
Western Cape	<p><b>Khayelitsha community screening:</b></p> <p><b>Setting:</b> The Carel du Toit Centre (CDT) launched a community outreach infant screening programme in 2001 at the Nolungile Clinic in Khayelitsha, screening about 100 infants per month.</p> <p><b>Findings:</b> This initiative demonstrated that routine community-based screening is feasible in primary healthcare settings.<sup>62</sup></p> <p><b>Mitchell's Plain MOU pilots:</b></p> <p><b>Setting:</b> Two studies conducted in the Mitchell's Plain/Klipfontein subdistrict demonstrate that community-based universal newborn hearing screening is both feasible and effective in public-sector primary healthcare settings.</p> <p>The first study – a 16-month pilot at a community MOU – screened 7 452 infants using both DPOAE and Automated Auditory Brainstem Response (AABR) technologies operated by trained lay screeners.<sup>ii</sup> The second, ongoing programme – initiated in 2012 by the CDT and the Western Cape Department of Health across three MOUs – incorporated hearing screening into routine postnatal visits every second day after birth, using either trained MOU staff or a dedicated screener.<sup>63</sup> Each model achieved high coverage, screening between 7 000 and 11 000 infants annually, with strong follow-up rates.</p> <p><b>Findings:</b> Both studies confirm the feasibility of AABR screening in community contexts, showing lower referral rates, higher diagnostic accuracy, and greater efficiency than OAE-only models. They also demonstrate the value of task-shifting, dedicated programme management, and timely diagnostic capacity at the tertiary level. However, systemic challenges persist – including long waits for diagnostic confirmation (averaging nearly three months), inconsistent diagnostic protocols, and weak coordination between MOUs and referral hospitals. While technology and training proved effective, these operational gaps limited timely diagnosis and intervention, underscoring the need for a national system to manage follow-up and ensure accountability across the EHDI pathway.</p> <p><b>Immunisation clinic pilot, City of Cape Town (2007–2012):</b></p> <p><b>Setting:</b> In 2007, CDT partnered with the City of Cape Town's Health Department to integrate OAE hearing screening into routine immunisation visits at eight primary healthcare clinics. Nursing staff were trained to conduct screening alongside immunisations, supported by a managing audiologist from CDT.</p> <p><b>Findings:</b> Although this was South Africa's first government-supported infant hearing screening programme, coverage reached only about 30% of infants, largely due to the heavy workload of nursing staff and the absence of dedicated screeners. The pilot revealed that integrating hearing screening into existing services is possible but requires sufficient staffing, defined responsibilities, and ongoing supervision.</p>

ii De Kock, T., Swanepoel, D. W., & Hall, J. W. 2016. Newborn hearing screening at a community-based obstetric unit: Screening and diagnostic outcomes. *International Journal of Pediatric Otorhinolaryngology*, 84, 124–131. DOI: 10.1016/j.ijporl.2016.02.031

	<p><b>Tygerberg Academic Hospital:</b></p> <p><b>Setting:</b> The targeted screening programme demonstrates the effectiveness of strong coordination, task shifting, and public–private collaboration. Since October 2016, two trained and experienced non-professional screeners have conducted hearing screening for more than 30 000 neonates in the hospital’s high-risk inpatient programme, showing that trained laypersons can deliver quality screening at scale. The programme is implemented in partnership with the CDT Trust, reflecting an effective public–private partnership that combines community-based capacity with professional oversight.</p> <p><b>Findings:</b> Tygerberg’s model shows that when programme management and referral pathways are well integrated, loss to follow-up is minimised and screening outcomes improve. (Personal communication from J. Birkenstock, Assistant Director of the Department of Speech Therapy and Audiology at Tygerberg Hospital. 2025.)</p> <p><b>Mowbray Maternity Hospital (MMH):</b></p> <p><b>Setting:</b> Since March 2024, the hospital has implemented UNHS using community health workers (CHWs), screening more than 15 000 babies. Despite this strong coverage, loss to follow-up and the absence of streamlined referral pathways have meant that very few babies have been formally identified with hearing loss.</p> <p><b>Findings:</b> The experience at Mowbray highlights how fragmented referral systems, particularly where babies must move between hospital and district services such as local clinics, undermine continuity of care and timely diagnosis. (Personal communication from Jessica McGuire Founding Director Hope-Hear.)</p> <p><b>City of Cape Town, 26 primary healthcare clinics:</b></p> <p><b>Findings:</b> An analysis of 26 clinics showed that most lacked equipment and trained staff, leaving large gaps in routine service delivery.<sup>64</sup></p>
<b>Limpopo</b>	<p><b>Rural primary healthcare clinics:</b></p> <p><b>Setting:</b> Community members trained by resident audiologists were appointed as designated screeners in three rural clinics.</p> <p><b>Findings:</b> Over 2 300 infants were screened, achieving 87% coverage, but diagnostic rates remained very low due to contextual factors such as the distance between clinics and tertiary centres and high transportation costs.<sup>65</sup></p>
<b>KwaZulu-Natal</b>	<p><b>Amajuba District, hospital-based:</b></p> <p><b>Findings:</b> A two-stage screening model (OAE+AABR) improved accuracy but required additional resources.<sup>66</sup></p> <p><b>Primary healthcare clinics:</b></p> <p><b>Setting:</b> A 2025 study found nurse-administered infant hearing screening at immunisation clinics reliable and feasible.</p> <p><b>Findings:</b> Agreement between nurses and audiologists was high, showing that trained nurses can integrate screening into routine services and expand access in resource-constrained settings.<sup>67</sup></p>

<b>Northern Cape</b> <b>North West</b> <b>Limpopo</b> <b>Mpumalanga</b> <b>Eastern Cape</b>	<p><b>NHI pilot sites in five provinces:</b></p> <p><b>Findings:</b></p> <ul style="list-style-type: none"> <li>• Only two provinces – Northern Cape and North West – had clinics (seven in total) that participated in the final study sample.</li> <li>• Only 26% pilot sites offered hearing screening, and just 11% had budgets for it. Clinics lacked valid and reliable screening equipment. Screening and follow-up were largely nurse-driven, with minimal audiologist involvement due to workforce shortages at the PHC level.<sup>68</sup></li> </ul>
<b>Gauteng</b>	<p><b>Rahima Moosa Mother and Child Hospital:</b></p> <p><b>Setting:</b> At the secondary academic hospital, only 4.4% of newborns were screened by resident audiologists.</p> <p><b>Findings:</b> Coverage rates were low due to a limited number of audiologists. Additionally, staff shortages and timing constraints resulted in a one-stage screening model, which produced high referral rates (47%). Follow-up rates were low (35%), reflecting the difficulty of maintaining continuity of care once patients were discharged to primary healthcare facilities.<sup>69</sup></p> <p><b>Chris Hani Baragwanath Academic Hospital:</b></p> <p><b>Setting:</b> Currently screens nearly half of all newborns (45% coverage) through a high-risk screening programme employing a designated screener model, coordinated and monitored by an audiologist. The screeners are enrolled in a learnership programme and receive stipends rather than permanent salaries.</p> <p><b>Findings:</b> While this model has proven effective in expanding coverage, it is not sustainable in the long term. Establishing permanent screener posts within hospital staffing structures is essential to ensure continuity, accountability, and the retention of trained personnel. (Personal communication from Sadna Balton Head of the Department of Speech Therapy, Chris Hani Baragwanath Academic Hospital [October 2025]).</p>

### Screener models:

Designated screener models have proven highly effective, delivering greater accuracy and efficiency because screeners focus exclusively on hearing tests rather than balancing multiple clinical duties. This approach also reduces high staff turnover challenges common among nurses working in primary healthcare clinics.<sup>70</sup> Screeners do not require prior clinical experience: several South African pilots have shown that community members and non-professional personnel can conduct newborn hearing screening accurately under audiologist supervision.<sup>71</sup> These designated-screener models outperformed nurse- or audiologist-led screening in high-workload settings.<sup>72</sup> Although the feasibility of a designated screener approach varies by local conditions, particularly in rural and urban settings and the size of the birthing caseloads – a recent South African study found that nurse-administered screening integrated into immunisation visits also achieved strong results. Integrated service delivery models demonstrate higher acceptability and improved performance indicators, and greater follow-up adherence. Locating a designated screener within routine maternal and child-care health services, therefore, promotes better outcomes and continuity of care.<sup>73</sup>

### Task shifting:

Advances in technology now enable task shifting from specialists to trained lay screeners. Modern hand-held devices combining OAE and AABR functions, with digital displays and step-by-step instructions, make screening easy to perform with minimal error.<sup>74</sup> In the Western Cape, lay screeners used this approach to test more than 7 000 infants successfully at the Mitchell's Plain MOU.<sup>75</sup>

- Mowbray Maternity Hospital has used CHWs since March 2024, screening more than 15 000 babies to date. However, loss to follow-up and the absence of a streamlined referral pathway have meant that very few babies have been formally identified with hearing loss.<sup>76</sup>
- In contrast, the targeted screening programme at Tygerberg Hospital demonstrates what is possible when systems are well coordinated.<sup>77</sup> According to J. Birkenstock, Assistant Director of the Department of Speech Therapy and Audiology at Tygerberg Hospital, the programme's success is due to strong referral coordination (personal communication, 2025). Two trained and experienced non-professional screeners have conducted more than 30 000 screenings in the high-risk in-patient screening programme since 2016, demonstrating the effectiveness of task shifting and trained lay screeners working under professional supervision.<sup>78</sup>

### Synthesis – feasibility and barriers:

Together, these initiatives confirm that EHDI is feasible across diverse service models, while exposing critical system-level barriers – such as audiologist shortages, low follow-up rates and gaps in equipment provision, maintenance and servicing.

The core pathway (screening, diagnosis, intervention) is routinely followed, but implementation strategies must be adapted to the realities and resource levels of each province to ensure equitable and sustainable scale-up.

#### Cross-cutting successes

- **Feasibility in diverse settings:** Both community and hospital models have proven effective in both rural and urban areas alike.
- **Routine integration:** Screening worked best when linked to postnatal and immunisation visits, allowing caregivers to access services within existing touchpoints.
- **Dedicated screeners:** Consistently improved coverage, accuracy and quality, especially in high-volume areas.
- **Two-stage protocols:** Reduced false-positive referrals and increased diagnostic accuracy.
- **Public-private partnerships:** Enhanced capacity and demonstrated scalable, replicable models.
- **Use of data, training and supervision:** Continuous learning and patient-information systems were critical to improving coverage, reducing referral rates and minimising loss-to-follow-up.

### Cross-cutting challenges:

Experience from pilots across provinces highlights recurring barriers that must be resolved for national scale-up:

- **Lack of programmatic coordination and accountability:** Even if facilities are equipped, staffed, and collecting data, outcomes remain uneven without a national coordinating programme to manage the EHDI pathway. A national coordinating and oversight mechanism is needed to track each child through screening, diagnosis, amplification, and early intervention, ensure quality assurance, and maintain accountability across provinces and sectors.
- **Loss to follow-up:** In Limpopo and Gauteng, many infants who were screened were never brought back for diagnostic testing, with follow-up rates as low as 15-35%.
- **Audiologist shortages:** Limited availability of audiologists led to delayed referrals, diagnostic backlogs, and reduced access to family-centred support and intervention services.
- **Equipment and staffing shortfalls:** Analyses of Cape Town clinics showed most lacked both screening devices and trained personnel, leading to significant service gaps.
- **High referral rates:** Pilots using only OAE screening produced referral rates up to 40%, placing strain on diagnostic services. However, these can be significantly reduced when protocols require that any baby who fails an OAE be immediately re-screened using an AABR within the same session. Ensuring adherence to OAE-AABR protocols improves efficiency and diagnostic accuracy while reducing unnecessary referrals.
- **Weak integration in NHI pilot sites:** Only 26% of sites offered screening, and just 11% had budgets, reflecting limited institutionalisation of hearing-screening services.
- **Infrastructure challenges:** Audiology services are often overlooked during the planning and design of health facilities, resulting in space and equipment constraints.

These common challenges show that without strategic investment in the workforce, equipment, and data systems and programme coordination, EHDI implementation will remain fragmented and inequitable.

## 5. Economic rationale

A 2022 global modelling study found that scaling up WHO-recommended hearing interventions to 90% coverage would require an investment of US\$238.8 billion over 10 years but would generate more than US\$3.7 trillion in health and productivity benefits. This represents a return of nearly US\$15 for every US\$1 invested. Although this analysis covers hearing care more broadly than newborn hearing screening alone, it underscores the strong economic case for integrating hearing services into universal health coverage.<sup>79</sup>

In South Africa, an estimated 6 000 children are born each year with moderate to profound hearing loss. The discounted lifetime societal cost for a single annual birth cohort is estimated at R16.4 billion, mainly driven by productivity losses (R11.9 billion, 72%), education costs (R4.0 billion, 24%), and direct healthcare (R383 million, 2.3%). Additional costs include quality of life impacts (R231 million, 1.4%), and social



assistance (R109 million, <1%).<sup>80</sup> These estimates exclude caregiver and family-related costs associated with transport, lost workdays, and emotional strain – meaning the true burden is even greater.

An intervention is considered cost-effective if it delivers health gains at a reasonable cost – typically defined as three times the GDP per capita for each year of healthy life gained.<sup>81</sup> In South Africa, this threshold is about R325 000 per Quality-Adjusted Life Year (QALY). By this measure, UNHS is highly cost-effective, preventing major lifetime costs while substantially improving both developmental outcomes and quality of life.<sup>82</sup>

These findings highlight the urgent need for UNHS to reduce avoidable costs and improve developmental outcomes. Put simply, newborn screening pays for itself: the long-term societal costs of late detection far outweigh the upfront investment for early screening and intervention.

## 6. Policy options for South Africa

South Africa faces a choice: maintain the status quo, pursue targeted screening, or adopt UNHS. Only universal screening delivers both equity and long-term savings.

POLICY OPTIONS	ADVANTAGES	LIMITATIONS
<b>Status quo: high-risk screening with sporadic UNHS</b>	Low immediate cost: no systemic changes required. <sup>83</sup>	<p>Worsens inequity, delays diagnosis, and misses the 1-6 months diagnostic window, further delaying developmental milestones.<sup>84</sup></p> <p>Example: Only 7.5% of public hospitals currently offer any hearing screening, and most children are diagnosed after age two.<sup>85</sup></p> <p>Example: The HI HOPES cohort (n = 532) shows that even under current conditions, the median age at identification remains around 28 months, with a seven-month delay between caregiver suspicion and formal diagnosis. These findings, drawn from the largest national dataset, confirm that without systemic reform, most children will continue to miss the critical early-intervention window.<sup>86</sup></p>
<b>Targeted screening: Neonatal Intensive Care Unit (NICU) and other high-risk infants</b>	Uses fewer resources; focuses on high-risk infants. <sup>87</sup>	<p>Misses around 50% of cases; relies on accurate risk identification.<sup>88</sup></p> <p>Example: A Gauteng pilot showed that many children diagnosed with hearing loss had no identifiable risk indicators.<sup>89</sup></p>

<b>UNHS</b>	Best coverage; supported globally by the WHO and the Joint Committee on Infant Hearing (JCIH). It is aligned to the HPCSA EHDI guidelines, <sup>90</sup> which aim to improve developmental outcomes as well as family support.	Requires upfront investment and a trained workforce. <sup>91</sup>  International and South African pilot studies show that UNHS improves early identification and long-term developmental outcomes.
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Summary: Maintaining the status quo will perpetuate late diagnosis and inequities. Targeted screening uses fewer resources but misses many infants. UNHS, while requiring upfront investment, is the only option that enables equitable access and long-term cost savings.

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**A significant number of hearing-impaired children in South Africa will continue to have their rights denied until EHDI is incorporated as part of a cohesive, systematic and comprehensive nationalised health care strategy that is contextually responsive and relevant.**

”

Khoza-Shangase and Kanji<sup>92</sup>

Significant work remains to design and cost a sustainable delivery model, particularly at a time when public finances for health care are constrained. At the same time, EHDI presents an opportunity to demonstrate the type of public-private collaboration envisaged under the NHI system.

Although the societal and developmental benefits of early hearing detection are undisputed, implementation feasibility remains challenging within South Africa's current health context. Evidence from NHI pilot sites shows that most primary healthcare clinics lack the equipment, training, and budget allocations required for newborn hearing screening.<sup>93</sup> However, as NHI strengthens primary healthcare re-engineering and community health worker platforms, it offers a practical funding and delivery mechanism for integrating hearing screening into routine maternal and child health services. Embedding EHDI within the NHI package would ensure sustainable financing, ensure continuity of care, and promote national equity in access.

## 7. Screening technology options

Newborn hearing screening relies primarily on OAE (Otoacoustic Emissions) and AABR (Automated Auditory Brainstem Response). Both are quick, safe, and non-invasive, but they differ in accuracy, cost, and operating conditions. Their effectiveness also depends on practical factors, such as ease of use, sensitivity to background noise, need for regular calibration and maintenance, and the ability to link results to digital systems for follow-up.<sup>94</sup>

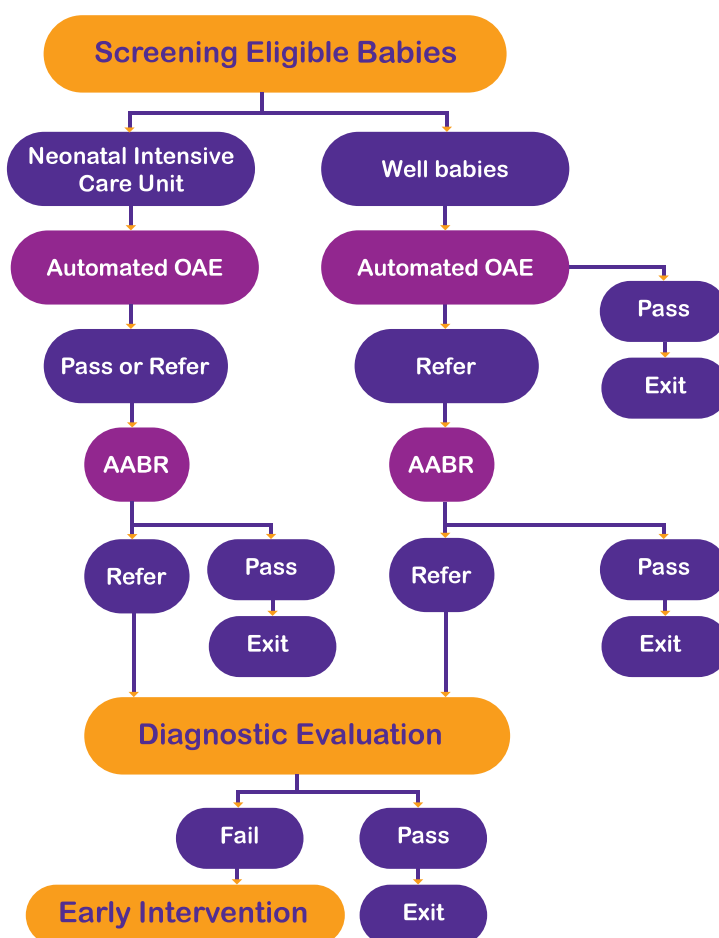
- **OAE:** Lower-cost, quick and relatively simple to use, but highly sensitive to background noise and prone to false-positive results. This means screening must be done in quiet settings, and results often require repeat testing and follow-up.<sup>95</sup>
- **AABR:** More accurate and less affected by noise, reducing the need for re-tests and allowing detection of auditory neuropathy. It takes longer to administer and requires a higher upfront investment.
- **Combination OAE/AABR:** Dual-function devices combining simplify screening, improve diagnostic accuracy, and expand access for trained screeners.<sup>96</sup>
- **High-frequency tympanometry (HFT):** Emerging evidence indicates that adding high-frequency tympanometry at the second screening stage can detect middle ear pathology – conditions such as fluid or infection behind the eardrum that affect how sound is transmitted – and thereby reduce false referrals.<sup>97</sup> South African audiologists have expressed support for including HFT in updated national protocols, and recent practice reviews note the need to update tympanometry standards. Integrating HFT must be aligned with strong programme coordination to ensure follow-up and pathway tracking when tympanometry indicates middle-ear conditions.

Evidence shows that the choice of technology influences both cost and effectiveness.

- **International evidence:** An Albanian study found that a two-stage (OAE→AABR) protocol was cost-effective but generated unnecessary referrals due to OAE's high false-positive rates.<sup>98</sup>
- **Evidence from dual usage (Western Cape):** A large pilot in the Western Cape compared Distortion Product Otoacoustic Emissions (a type of OAE test) and AABR by alternating the two technologies in an MOU setting. More than 7 000 infants were screened, with AABR showing lower referral rates (4.6% vs 7.0%), higher true-positive rates (44.4% vs 4.2%), and greater diagnostic yield (1/1000 vs 0.3/1000). Both technologies achieved high re-screen follow-up rates (>85%), but AABR proved more accurate and efficient, suggesting it may be better suited for routine use where resources allow. It also required fewer consumables and experienced fewer breakdowns, further impacting costs.<sup>99</sup>

Beyond clinical performance, several non-clinical issues shape feasibility. Devices require regular calibration, probes and leads are fragile and easily damaged. Reliable connectivity to cloud-based data systems is needed for accurate tracking.<sup>100</sup> In South Africa, the lack of uniform data-management systems across public and private sectors remains a major barrier. A national survey found that most audiology departments still rely on paper-based records, with no shared or centralised system for tracking referrals or outcomes.<sup>101</sup> Developing electronic or hybrid data systems that can function offline and synchronise when connected – such as REDCap<sup>iii</sup> or other secure web-based tools – would strengthen continuity of care and enable real-time monitoring across facilities.<sup>102</sup> The WHO emphasises that without such supporting systems, screening accuracy and follow-up are compromised – highlighting the importance of planning not only for equipment but also for the infrastructure that sustains its use.<sup>103</sup>

Figure 2: Typical screening protocols for high- and low-risk babies

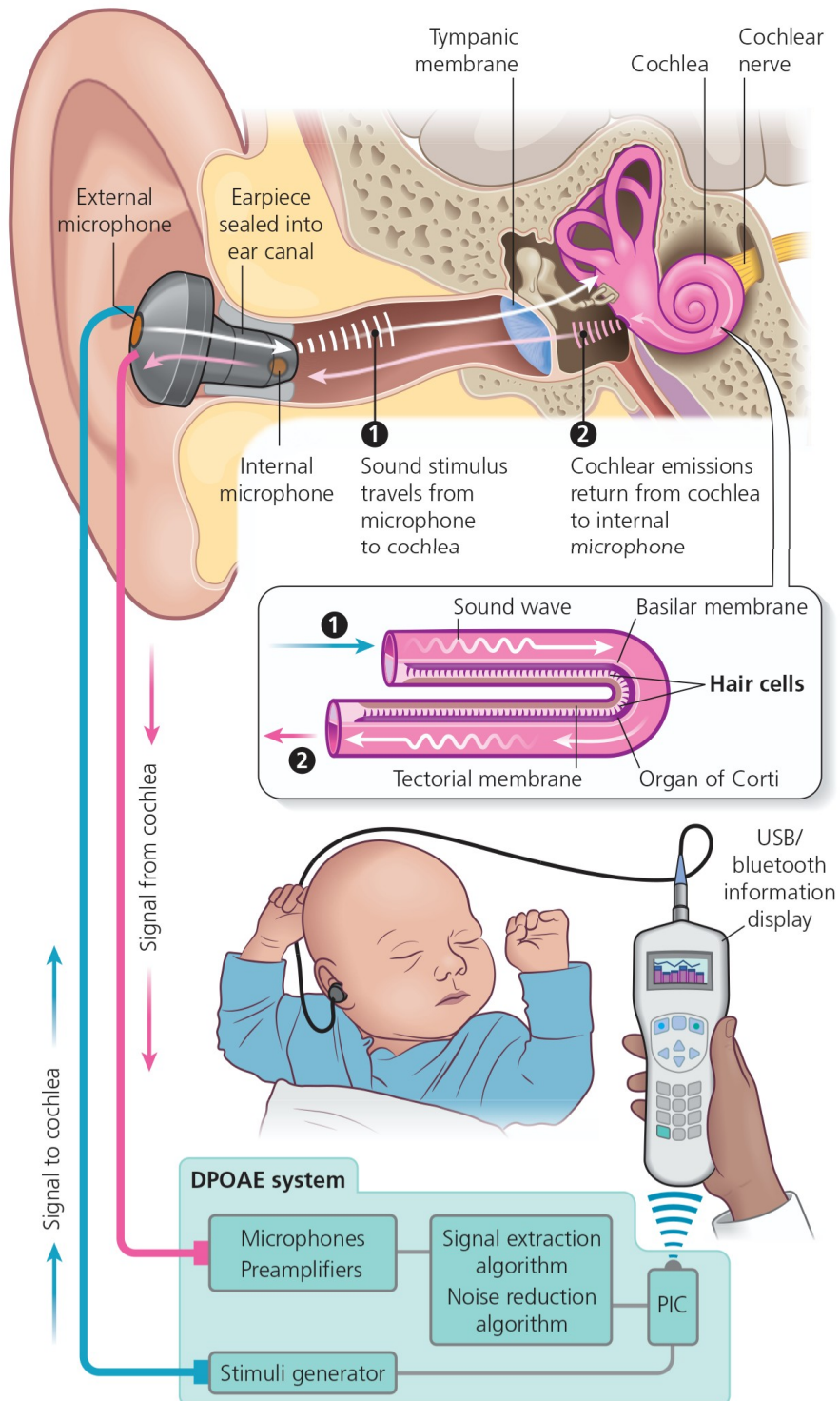


Source: Adapted from WHO screening protocols in Olusanya<sup>104</sup>

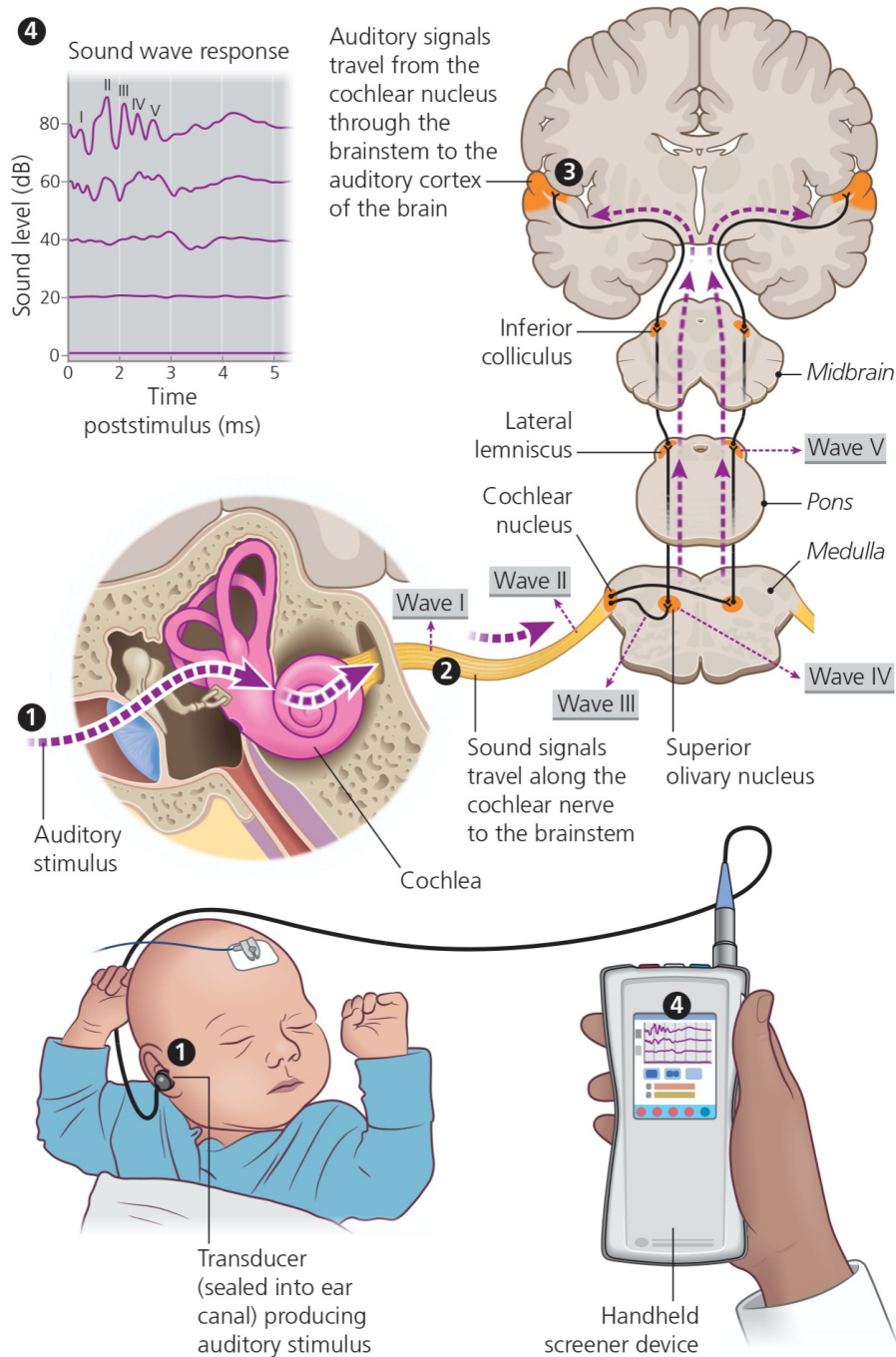
iii REDCap (Research Electronic Data Capture) is a secure, web-based data management platform developed by Vanderbilt University. It allows offline data collection with later synchronisation, supports encrypted storage, and is widely used in South African health programmes for tracking patient-level data and monitoring outcomes.

Figure 3: Newborn infants undergoing (a) OAE and (b) AABR screening

(a)



(b)

Source: Yoshinaga-Itano, C.<sup>105</sup>



## 8. Family-centred early hearing care:

Family-centred early hearing care recognises that a child's progress depends largely on active family involvement. Effective EHDI programmes, therefore, treat caregivers as equal partners in the hearing-care team. Involving caregivers in the assessment process not only builds their understanding of each step but also strengthens their capacity to support their child's development at home.<sup>106</sup>

**Family centred hearing care can take place in specialist facilities, such as the Carel du Toit centre in the Western Cape or in communities (integrating home-based care and local support services)**

### CASE STUDY: Home-based Family-centred support: The HI HOPES model

The HI HOPES programme – currently the only comprehensive family-centred early-intervention service of its kind in South Africa – demonstrates the effectiveness of home-based support for infants with hearing loss. The programme provides a free home-based early intervention service for deaf children and their families from birth to 6 years old, linking families to audiology, speech therapy, and social support services.<sup>107</sup>

Families also receive emotional support, communication guidance, and practical strategies that promote children's development. Evidence shows that early intervention – combining clinical services and broader support (including guidance on culturally responsive practices, collaborative family-patient relationships and access to social support – produces better outcomes. Children enrolled in comprehensive early intervention within their first year of life have been shown to have age-appropriate language development by five years of age.<sup>108</sup>

The HI HOPES model:

- Uses a home-visiting model of early intervention, with trained parent advisors (some of whom are parents of children with hearing loss themselves) delivering information and emotional support to families.
- Builds parental confidence, strengthens caregiver capacity, tracks and assesses language and communication development, and links families with diagnostic, audiology and therapy services.

Since 2006, HI HOPES has operated in six provinces, reaching more than 6 000 families through services delivered in the child's natural home environment and, wherever possible, in the family's home language.<sup>109</sup> The programme includes Deaf Mentors, who act as cultural and language role models, providing families with exposure to Deaf identity and sign language.

Despite strong evidence of effectiveness, HI HOPES remains donor-funded and is not yet available nationwide. This underscores the need for sustained government support to ensure that all families benefit from family-centred early intervention.

A 2025 costing study [in press] evaluated HI HOPES' operational expenses and projected the resources required for national scale-up using a detailed costing method that itemised staffing, supervision, transport and overheads.<sup>110</sup> The study found:

#### Current programme costs (2022):

- **Coverage:** 311 children served across six provinces
- **Financial cost:** R4.3 million
- **Total economic cost:** R5.3 million
- **Average cost per child per year:** R17 000 to R27 000
- **Main cost drivers:** personnel (55%), home visits (30%), overheads (11%)

#### Projected cost for a national scale-up rolled out over three years:

- **Year 1:** R23 million (economic costs)
- **Year 2:** R25.7 million
- **Year 3:** R32.3 million
- **Total three-year cost:** about R81 million
- **Per child annual costing:** R70 000 to R90 000 (due to expanded coverage and service intensity)
- **Main cost components:** Home visits (70-78%) and staff salaries (14-16%)<sup>111</sup>

## 9. Key enablers for scale-up

A phased approach to universal newborn hearing screening will allow South Africa to scale sustainably while addressing gaps in workforce, infrastructure, and systems.

ENABLERS	ACTIONS
Policy commitment	Mandate UNHS by mobilising national endorsement by senior leadership within the National Department of Health (NDoH), of the EHDI Guidelines drafted by the HPCSA. Integrate EHDI in the drafting of NHI service packages and prioritise it within routine child and maternal healthcare services, with both outcome and performance indicators to drive accountability. <sup>112</sup>

<b>Hearing screening delivery model</b>	<ul style="list-style-type: none"> <li>• <b>Timing:</b> Screen all newborns within the first 4-6 weeks of life.<sup>113</sup></li> <li>• <b>Decentralised:</b> Conduct screening at the appropriate level of care (such as maternal obstetric units (before discharge or at postnatal visits)<sup>114</sup> and/or routine immunisation visits) to increase access, reduce patient travelling distances and associated costs and reduce the burden on tertiary-level hospitals.<sup>115</sup> Decentralisation must also ensure that appropriate resources for intervention are available, including access to hearing aids, aural rehabilitation, and speech therapy services, so that screening is linked to timely and effective follow-up care.<sup>116</sup></li> <li>• <b>Designated personnel:</b> Identify UNHS as a priority through a designated screener delivery model through task shifting to healthcare workers, using adequate training, audiologist support and technology.<sup>117</sup></li> <li>• <b>Family-Centred Early Intervention (FCEI):</b> Strong evidence shows that family-centred early intervention – where caregivers are coached and supported as active partners – improves children’s language, cognitive, and social outcomes.<sup>118</sup> South African evidence confirms that caregivers value this approach but face barriers such as limited professional support, inconsistent follow-up, and poor service coordination.<sup>119</sup> Integrating FCEI principles into national EHDI planning will strengthen child’s development and build family capacity to sustain intervention at home.</li> </ul>
<b>Human resources</b>	Train and deploy designated screeners with audiologists providing oversight for diagnosis and intervention. <sup>120</sup>
<b>Protocols and systems</b>	<p>Standardise screening and referral protocols.<sup>121</sup> Capture routine indicators in the DHIS for monthly reporting,<sup>122</sup> and use a patient-level system such as the DHIS2’s Tracker (adopted by DoH in 2017) to follow each child across screening, referral and diagnosis and intervention.<sup>123</sup></p> <p>However, data systems alone cannot ensure continuity of care: a national EHDI coordination programme is needed to assign responsibility for follow-up, ensure accountability at each step, and manage movement between facilities. Without a designated coordinating structure – costed and resourced within the national health budget – even the best-equipped sites risk losing families along the care pathway, particularly in contexts where caregivers often move between clinics and hospitals in search of care.</p> <p>Evidence from South Africa shows that text-message reminders can improve attendance at critical health visits.<sup>124</sup></p>

<b>Scale-up and financing</b>	Begin in NHI pilot districts and areas with existing capacity, then scale provincially. Combine government funding with donor support and public-private partnerships to expand coverage and sustain equipment, training and maintenance. <sup>125</sup>
<b>Public awareness</b>	Implement targeted caregiver campaigns to reduce stigma around hearing screening, encourage attendance at postnatal/immunisation visits, and encourage follow-up after referrals. <sup>126</sup>

## 10. Monitoring and evaluation

Robust monitoring and evaluation are critical to ensure programme quality, screening coverage, timely diagnosis, follow-up, and intervention outcomes. Core monitoring indicators should include:<sup>127</sup>

- % screened by 1 month,
- % diagnosed by 3 months,
- % enrolled in intervention by 6 months,
- % lost to follow-up (both for rescreening and diagnostic assessment).

The Road to Health Booklet (RtHB) – South Africa’s national child-health record and monitoring tool – tracks growth, immunisations, and developmental milestones, including early hearing and communication skills. It also provides a standard section to record newborn hearing screening results and follow-up appointments.<sup>128</sup>

The developmental-screening checklists and the “Screening and Test Results” page, enable consistent tracking, support timely referrals, and reduce the risk of children being lost to follow-up.<sup>129</sup> However, these tools are largely passive monitoring instruments. Without an active, programme-level pathway management system that ensures each child moves through screening, referral, diagnosis, and intervention, babies and families can still fall through the cracks. The RtHB and data systems like DHIS2 should serve as monitoring and evaluation mechanisms, but real accountability must rest within the programme itself – where follow-up is actively coordinated, not merely recorded.

Key risks include loss to follow-up, staff turnover, data gaps and equipment breakdowns. These can be mitigated through integrated services, digital tracking systems, and continuous training. DHIS should be used for routine aggregate reporting, while DHIS2 Tracker (or equivalent) should be used for patient-level, longitudinal tracking across facilities and sectors.<sup>130</sup>

# Conclusion

South Africa faces a clear choice: maintain the status quo or implement a national EHDI programme so every child can reach their full potential. Universal newborn hearing screening, integrated into routine maternal and child health services and supported by robust data systems and trained screeners, is feasible, cost-effective and equitable.

The specific implementation details – including specific service modalities, human resource needs and costing – now need to be worked out. This planning should take the full available capacity into account, both in the public and private sectors. In this regard, EHDI provides a great opportunity to demonstrate the effective public-private collaboration envisaged under the NHI framework.

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## **Early Hearing Detection and Intervention (EHDI) Community of Practice:**

An open, collaborative network bringing together stakeholders from across the care pathway to strengthen early hearing detection and intervention. Shared learning, coordinated action, and continuous improvement is fostered. All who play a role in the EHDI landscape are welcomed and invited to participate, connect, exchange insights, and co-create solutions that advance accessible, equitable EHDI services for all children and families across South Africa.

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