Breaking the Silence: A Systematic Review on the Global State of Newborn Hearing Screening Policies

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Introduction

Congenital hearing loss affects 0.1–0.3% of newborns and 2–4% of those admitted to neonatal intensive care units. Early detection of hearing loss is vital for optimal language development and learning outcomes. Many nations lack formal policies for newborn and infant hearing screening (NIHS), posing significant challenges to ensuring early identification and intervention. This systematic review evaluates the existence of NIHS policies, their impact on program implementation, and barriers to policy enactment and program execution.

Methods and Materials

Following PRISMA guidelines, this systematic review included studies published between 2014-2024. Comprehensive searches were conducted in PubMed, Embase, Scopus, CINAHL, and Google Scholar. Studies addressing NIHS policy existence, implementation outcomes, and barriers were included. Nine reviewers (A.F., M.Z., N.P., J.B., E.P., O.S., B.Y., V.E., A.M.) established inter-rater reliability for all included studies. Data extraction focused on policy information, screening coverage, and insights into challenges.

Results

We assessed 77 studies in our review. Findings identified significant disparities in the presence and implementation of NIHS policies. Countries with NIHS policies show a higher percent of eligible infant participation (p=0.0023). OLS regression also showed positive association of policy with infant participation in NIHS, even controlling for income group and year.

Presence of policy is also significantly associated with income level (p=0.015). High-income countries, such as US, UK, Germany, and Japan, demonstrated higher policy coverage and implementation rates. High-income countries were more likely to encounter barriers such as loss to follow up, poor data management, and quality control, though the only statistically significant relationship was poor data management (p=0.041). In contrast, low- and lower middle-income countries, such as Ghana, India, and Kenya, were less likely to have policies in place. Additionally, they faced challenges such as cost, personnel shortages, equipment access, facility uptake, and access to hospital/facility. Both income groups encountered difficulties with public awareness and training, though countries with policy were less likely to report public awareness as a barrier (p=0.008).

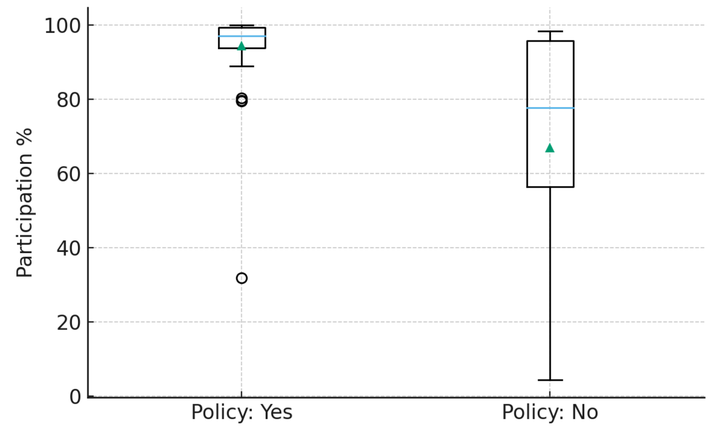

Figure 1. Percent infant participation by NIHS policy presence.

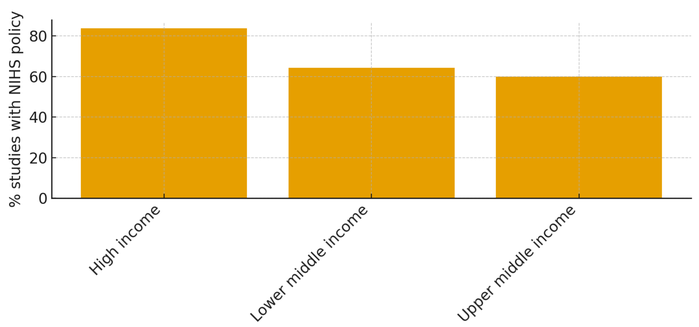

Figure 2. Policy presence by income group (from World Bank classification).

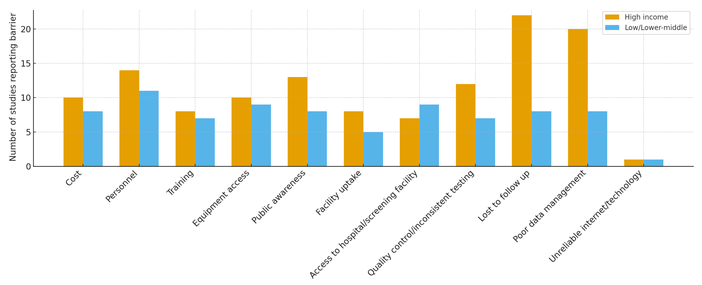

Figure 3. Comparison of barriers across high-income and lower middle-income countries.

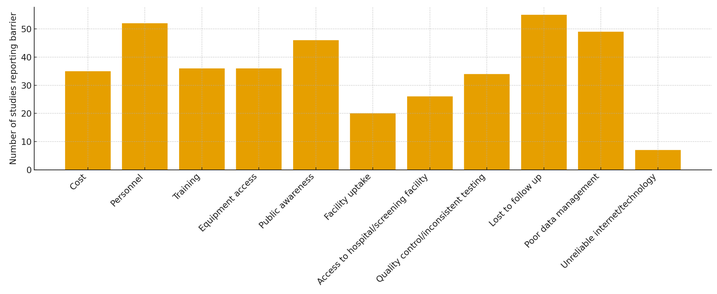

Figure 4. Frequency of barriers documented across all studies.

Discussion

Countries with NIHS policies achieve higher coverage of newborn screening than those without, which suggests that legislation helps boost participation, possibly via structural support and funding.

Policy adoption reduces fundamental barriers, such as personnel and equipment shortages. However, obstacles associated with increased scale, such as data tracking and loss to follow up, persist even despite policy implementation. Early investment in data organization and care coordination should accompany policy to ameliorate these issues.

Low-middle income countries (LMIC) experienced barriers with cost, personnel shortages, equipment access, facility uptake, and access to hospital/facility, which is more indicative of resource constraints and infrastructural gaps. On the other hand, high-income countries struggled with loss to follow up, poor data management, and quality control. This is more consistent with system coordination issues, as opposed to a lack of basic resources. Shared barriers included public awareness and training of hearing care professionals. Importantly, barriers are reports across all income groups and policy statuses, which reinforces that having a policy does not automatically eliminate barriers to implementation.

With these findings in mind, interventions should be context-specific. For low-income countries, it is critical to prioritize funding, equipment supply chains, workforce training and development, and transport to screening sites. Regarding high-income countries, maintenance of success is contingent on strengthening of data systems and care coordination, as well as parental engagement and health education.

Further investigation should investigate policy characteristics, such as funding and longevity, as well as impact of screening device and protocol on quality control and facility uptake.

Conclusions

The existence of NIHS policies is crucial to the feasibility and sustainability of hearing screening programs. However, significant gaps remain, particularly in LMICs, where systemic and contextual challenges hinder policy enactment and program execution. Addressing these barriers requires coordinated efforts involving policy advocacy, capacity building, and sustainable funding models to improve early hearing loss detection and intervention globally.

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