Title **The effectiveness and safety of preschool hearing screening programs**

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Aim
To evaluate the safety, performance, and effectiveness of universal and targeted preschool hearing screening (PHS) in the presence or absence of universal newborn hearing screening (UNHS) programs. The cost-effectiveness of various preschool hearing screening strategies was also assessed.

Conclusions and results
Safety and effectiveness
None of the studies identified assessed universal or targeted PHS in the absence of a UNHS program. Two rapid reviews, two systematic reviews, and three primary studies addressed various aspects of preschool hearing screening programs within the context of UNHS. Overall, referral rates were high, ranging from about 8% or more of those screened, while the yield (those with confirmed hearing loss) represented less than 1% of the population screened. However, the conclusions that can be drawn from this evidence about the contribution of universal or targeted PHS to the identification of hearing loss is limited by the uncertainty regarding the prevalence of hearing loss in populations with UNHS programs and by differences in the screening settings, the ages of the study populations, and the screening tests and protocols used.

One retrospective study and one systematic review of three randomized controlled trials assessed the potential effects of PHS on language and developmental outcomes. The studies found no statistically significant or clinically meaningful difference between those who were screened and those who were not. No studies reported on the safety of either universal or targeted screening.

Cost-effectiveness
One systematic review of acceptable quality was identified. Potentially cost-effective strategies included universal school entry screening with pure-tone sweep tests, composite universal school entry screening, and high-accuracy targeted school entry screening; all were associated with additional costs and improved outcomes compared with no screening. Of these, high-accuracy targeted school entry screening may be the most cost effective, but its applicability is dependent on whether the additional effectiveness is worth the additional cost.

There was limited published economic evidence available on the cost-effectiveness of hearing screening in preschool-aged children.

Recommendations
No benefit was demonstrated for universal PHS within the context of a UNHS program. Potential benefit may exist for targeted screening of at-risk children, but the realization of these benefits may be hampered by significant challenges in ensuring timely referral, diagnosis, and treatment.

Methods
Please refer to the full report for details of the methods.

Further research/reviews required
To establish the comparative effectiveness of PHS, it is important to know the number of cases that remain to be identified by PHS after the application of a UNHS program. The uncertainty around this number is perhaps the greatest limitation of the research literature in this area. Although many of the screening tests that may be used in PHS programs have been examined in experimental accuracy studies, not all have been formally evaluated in a program setting, which raises questions about the feasibility and reliability of using these tests.

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