

Now Is the Era When Everyone Can Easily Measure and Monitor Hearing

Wang Shangqiguo, MSc, PhD; Cullington Helen E., MSc, MA, PhD; Reed Nicholas S., AuD, PhD

Hearing is one of the most fundamental human senses, essential for communication and connection. Yet unlike vision or blood pressure, most people never “measure” their hearing until noticeable problems arise. Age-related hearing loss may impact various aspects of well-being over time, including social engagement and cognitive health.¹⁻² Stigma, limited access to care, and the absence of simple, universal metrics all contribute to the underdiagnosis and undertreatment of hearing loss.

A key hearing metric in clinical audiology is the four-frequency pure-tone average (PTA4): the mean hearing threshold at 0.5, 1, 2, and 4 kHz, representing the speech frequencies most important for daily communication. Both the World Health Organization (WHO) and the American Speech-Language-Hearing Association (ASHA) use PTA4 to classify hearing loss severity.³⁻⁴ However, these definitions rely on broad categorical labels such as “mild,” “moderate,” and “severe,” with thresholds that differ across organizations, usually in 15-dB increments. Someone whose PTA rises from 25 to 39 dB would remain “mild” under WHO’s definition, even though their real-world communication has declined. Such broad labels can mask gradual progression and reduce the urgency to act.

THE NEED FOR A UNIVERSAL HEARING METRIC

In healthcare, most indicators are expressed through simple numbers such as blood pressure, heart rate, or visual acuity, which people easily understand. These metrics are not exhaustive, but they are accessible, intuitive, and powerful for raising awareness.

Hearing, by contrast, has historically lacked such a universal metric. Audiologists rely on pure tone audiometry to plot an



audiogram, but this tool has been largely confined to clinical settings. For the public, there has been no straightforward number to describe “how well I hear” or to track subtle changes over time.

In 2020, researchers proposed reframing PTA4 as the Hearing Number: a single, intuitive measure linking hearing status to WHO categories.⁵ A lower number means better hearing, while a higher one reflects increasing difficulty. For instance, values between -10 and 19 dB indicate little trouble, whereas those above 35 dB signal moderate loss. Thus, the Hearing Number serves as hearing’s equivalent of “20/20 vision” or “120/80 blood pressure,” bridging professional precision with public understanding.⁶

From a professional perspective, PTA4 is not a perfect measure of auditory function, as it does not capture speech-in-noise ability, auditory processing, or listening effort. Still, for public health purposes, it may be the most practical universal metric available. By providing a single, cross-linguistic, easily explained continuous number instead of a static category, the Hearing Number promotes awareness, earlier detection, and meaningful long-term tracking.

The Johns Hopkins Bloomberg School of Public Health recently launched a U.S. campaign promoting the Hearing Number through a free app that explains results and offers age-based comparisons.⁶ Mirroring earlier successes such as blood pressure and body mass index (BMI) initiatives, the campaign aims to make hearing health part of everyday

Dr. Shangqiguo Wang is a Postdoctoral Fellow at the University of Hong Kong. His research focuses on hearing and cognitive screening, as well as the outcome evaluation of hearing devices.

Professor Helen Cullington is an Audiologist and a Professor at the University of Southampton Auditory Implant Service, United Kingdom. She has 32 years of experience across six cochlear implant centers worldwide. She is the Editor-in-Chief of Cochlear Implants International and a former Chair of the British Cochlear Implant Group.

Dr. Nicholas Reed is an Associate Professor in the Departments of Otolaryngology and Population Health at New York University Grossman School of Medicine. He is also an Adjunct Faculty at the Cochlear Center for Hearing and Public Health at Johns Hopkins Bloomberg School of Public Health.

MEASURE/MONITOR HEARING

conversation. Global adoption could empower people to “own” their hearing and normalize routine monitoring.

TECHNOLOGY FOR SELF-ASSESSMENT: FROM CLINICS TO SMARTPHONES

Traditional hearing assessments required a sound-treated booth, calibrated audiometer, and professional supervision. Today, smartphones and wireless headphones have transformed accessibility for everyone. One widely used example is the hearWHO digits-in-noise test, which measures the ability to recognize numbers in background noise.⁷ Its advantage is that it does not demand strict control of testing conditions. However, it is language-specific and requires new development for each version, and its results cannot easily be expressed as a universal metric like the Hearing Number.

More directly aligned with traditional audiometry are smartphone-based pure tone audiometry apps. These apps play tones at various frequencies and volumes, and users indicate when they can hear them. Validation research shows that well-designed apps achieve clinically acceptable accuracy for most use cases.⁸⁻¹⁰ Limitations remain: results vary across devices and headphones, and accuracy decreases for hearing losses greater than 80 dB, and ambient noise can interfere. Most apps use “loose calibration” methods, such as recommending specific headphone models or setting a fixed volume level. For these reasons, smartphone audiometry should be considered a screening tool rather than a diagnostic replacement. Nonetheless, in regions where access to professional testing is limited and for individuals seeking convenience and regular monitoring, these apps fill a critical gap. With further improvements, such as pre-calibrated headphone support and active noise cancellation, smartphone PTA results are becoming increasingly more accurate.

Major technology companies are taking notice. The Mimi Hearing Test app integrates with Apple Health, enabling users to monitor long-term hearing trends. In 2024, Apple introduced a hearing-test feature directly through AirPods Pro.¹¹ With an

estimated 120 million AirPods to be sold globally in 2025,¹² the incorporation of hearing assessment into such widely-used devices could be transformative. This moves hearing care from specialized clinics into everyday life. This makes large-scale screening affordable and gives professionals new opportunities—patients may arrive earlier with self-collected hearing data.

CLINICAL AND PUBLIC HEALTH IMPLICATIONS

For professionals, the rise of the Hearing Number and smartphone testing is not a threat but an opportunity. These tools will not replace clinical diagnostics; rather, they enhance engagement and broaden the pathway to care.

Early detection: Individuals who might otherwise ignore subtle hearing changes can be alerted sooner.

Public awareness: A universal metric fosters greater understanding of hearing loss risks across the lifespan.

Epidemiology: Large-scale, low-cost screening could provide richer data on population hearing health.

Patient empowerment: Self-monitoring encourages individuals to take proactive steps—whether adopting hearing protection, seeking evaluation, or exploring amplification options.

Ultimately, these tools strengthen rather than replace professional roles, extending the reach of hearing care and connecting more people to timely support.

CONCLUSION: TOWARD AN INCLUSIVE ERA OF HEARING HEALTH

The Hearing Number and the rise of self-testing apps represent a paradigm shift in hearing health. Together, they make hearing measurable, personal, and trackable, much like blood pressure or vision. As these innovations gain traction, routine hearing monitoring may finally become part of everyday wellness. 

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