

# Adolescent Hearing Loss: Rising or Not, It Remains a Concern

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In this issue of *Pediatrics*, Barrett and White<sup>1</sup> report on the prevalence of adolescent hearing loss using data from the National Health and Nutrition Examination Survey (NHANES). Specifically, they extend the findings of Shargorodsky et al's<sup>2</sup> 2010 publication, which compared the prevalence of adolescent hearing loss in the third NHANES (1988–1994) to NHANES 2005–2006. Shargorodsky et al<sup>2</sup> reported a significant rise in the prevalence of adolescent hearing loss from 14.9% to 19.5% using these 2 time points, but when the 2008 and 2010 data are included, the prevalence does not appear to have significantly changed since 1994.<sup>1</sup> Barrett and White<sup>1</sup> conclude that Shargorodsky's often cited manuscript on the rising prevalence of adolescent hearing loss is not substantiated when subsequent NHANES data cycles are included.

In considering the new findings, it is valuable to understand the limitations of the NHANES cross-sectional study design. Cross-sectional data allow for assessment of an individual's hearing at 1 point in time.<sup>3</sup> Audiometric testing, especially with youth, involves many subjective components and environmental factors when compared with more objective measurements such as blood testing. The NHANES audiometric testing protocol included a set of preexamination questions about the presence of ear tubes, current cold symptoms, sinus symptoms or ear problems, and recent loud noise exposure.<sup>4–7</sup> Other than ear pain severe enough to preclude wearing headphones and inability to remove hearing aids, participants were not excluded from testing for a positive

response to these items.<sup>4–7</sup> Testing also included monitoring for ambient noise.<sup>4–7</sup> Shargorodsky et al<sup>2</sup> included some of these data on ear infections and noise exposure in their analyses, neither of which were significantly associated with hearing loss. Barrett and White<sup>1</sup> omitted the risk factor data, stating they were more interested in data trends. However, it is possible that some of these risk factors or environmental circumstances account for the fluctuations in the prevalence data. The authors themselves acknowledge that one might question if the rise and then steep drop in the 2010 prevalence data were a function of sampling conditions.<sup>1</sup>

Regardless, whether adolescent hearing loss has increased or remained stable, it still affects ~15% of US adolescents.<sup>1,2</sup> This is on par with many other widely publicized issues facing US adolescents today. For example, the prevalence of asthma among US adolescents is ~10%, obesity 18.4%, and major depressive disorder 12.5%.<sup>8–10</sup> It has been demonstrated repeatedly that unidentified hearing loss is associated with negative effects on social interactions, educational achievement, and future workplace success.<sup>11–14</sup> Despite the morbidities and economic burden associated with hearing loss, adolescent hearing screening and conservation are poorly acknowledged and addressed by the public and in primary care. This is in part because unlike the above-mentioned issues (eg, asthma), the efficacy of strategies to meaningfully prevent or reduce adolescent hearing loss and its associated morbidities remains unproven.

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In their most recent revision, the authors of *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents* and the American Academy of Pediatrics provide updated guidelines on adolescent hearing screening.<sup>15,16</sup> However, requirements for youth to use hearing protection and national product regulation of infant sound machines, children's toys, and volume limiting devices marketed to parents are lacking. Barrett and White<sup>1</sup> call for NHANES to resume collecting audiometric data, but it seems a better approach is to put hearing screening and conservation practices into action and then study the effect on hearing loss prevalence.

#### ABBREVIATION

NHANES: National Health and Nutrition Examination Survey

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