



Short report

Estimating the worldwide burden of health loss due to hearing loss

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We planned this study to define the worldwide burden of health loss attributed to hearing impairment occurred during the past 10 years according to the 2019 Global Health Data Exchange (GHDx) database. The current worldwide burden of health loss due to all forms of hearing impairment is estimated at 43.4 million Years Lived with Disability (YLDs), representing 28% of cumulative YLDs due to all physical impairments in GHDx. The hearing loss-attributable YLDs have linearly increased ($r=0.997$; $P<0.01$) by 18.7% during the past 10 years. Reinforced policies are hence needed for preventing development of mild hearing impairment and/or progression toward more severe deficiencies.

Introduction

According to the World Health Organization (WHO), hearing loss is portrayed as a condition when somebody is unable to hear as well as someone who is supposed to have normal hearing.¹ This pragmatic definition could be more specifically circumstantiated as an auditive impairment ≥ 20 db recorded on pure tone audiometry.² The clinical, social and economic consequences of hearing impairment are paramount, whereby a progressive decay of this essential sensory function is associated with enhanced risk of morbidity and mortality and is a common cause of social isolation, as well as potential unemployment or underemployment.³ Some previous epidemiological studies revealed that the burden of hearing loss, and especially its influence on the state of health and wellbeing, has constantly increased during the past decades. In particular, a recent analysis published by the Global Burden of Disease (GBD) 2019 Hearing Loss Collaborators has estimated that ~ 1.6 billion people may currently suffer from hearing loss all around the world, accounting for a prevalence as high as 1:5, which is predicted to further increase by over 50% during the next 30 years.² The remarkable epidemiologic burden of this sensory deficit may inherently exert a profoundly negative impact on the quality of life of affected people,⁴ which could only be reverted if proper preventive policies and efficient therapeutic measures are applied. We have hence planned a further analysis on the Global Health Data Exchange (GHDx) database, to more precisely define the worldwide burden of health loss attributable to hearing impairment which occurred during the past 10 years (i.e. between 2010 and 2019).

Methods

Epidemiologic information on the burden of health loss caused by different degrees of hearing loss was collected with an electronic search

in the last update (year 2019) of GHDx database, a large worldwide repository of health-related information provided by the Institute for Health Metrics and Evaluation.⁵ A specific electronic search was conducted in the GHDx database with the keyword 'hearing loss' in the section 'impairment', complemented with the additional epidemiologic variables 'measure' (set to 'Years Lived with Disability'; YLDs), 'metric' (set to 'number'), 'year' (year range between '2010-2019'), 'sex' (set to 'both', 'males' and 'females'), 'age' (set to 'all ages'), 'location' (set to 'global') and severity [including all options, i.e. 'mild' (20–34 db), 'moderate' (35–49 db), 'moderately severe' (50–64 db), 'severe' (65–79 db), 'profound' (80–94 db) and 'complete' (≥ 95 db)].

The data from these searches were imported into a Microsoft Excel datasheet (Microsoft, Redmond, WA, USA), and then graphically plotted and statistically analyzed. Simple (Pearson's correlation) regression analysis was used for defining the correlation between time and variation of hearing loss-attributable YLDs. The study was performed in accordance with the Declaration of Helsinki and under the terms of relevant local legislation. This analysis was based on electronic searches in an open and publicly available repository (GHDx), so that no informed consent or Ethical Committee approvals were necessary.

Results

Based on the last updated version of the GBD 2019 Data Resources, the current worldwide burden of health loss due to all forms of hearing loss is estimated at 43.4 million YLDs, 21.4 million YLDs in females and 22.0 million YLDs in males, representing 28%, 25% and 32% of cumulative number of YLDs caused by all types of physical impairments listed in the GHDx database. This value makes hearing loss the leading GHDx cause of YLDs in males and the second in females, in whom it is only preceded by anemia (37.7% of cumulative YLDs). As shown in [figure 1](#), the hearing loss-attributable YLDs have increased almost linearly during the past

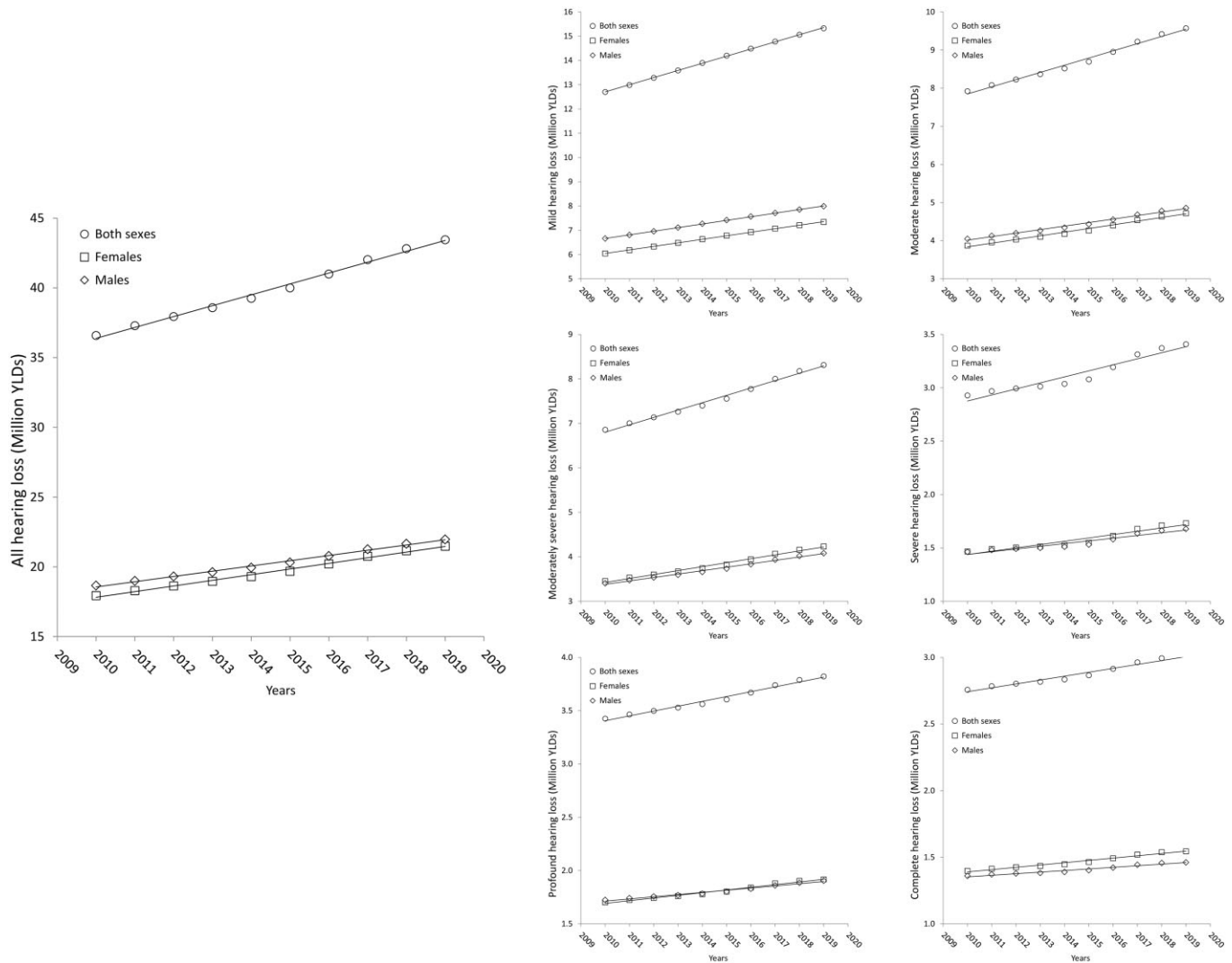


Figure 1 Progression of hearing loss-attributable Years Lived with Disability (YLDs) during the past 10 years (i.e. from 2010 to 2019)

10 years, by 18.7% in both sexes ($r=0.997$), 19.8% in females ($r=0.997$) and 17.7% in males ($r=0.997$), respectively (table 1). The time-dependent increase of YLDs caused by different severity of hearing loss is also summarized in figure 1 and Supplementary table S1. For all degrees of hearing impairment, the variation of YLDs displayed a linear increase, with correlation coefficients (r) always higher than 0.96. The highest increase of YLDs during the past 10 years has been recorded for milder, moderate and moderately severe forms (all around 20% increase), whilst the surge of YLDs due to profound and complete hear loss was nearly half compared to that seen for milder hearing impairment (between 9.0% and 11.6%). Throughout all conditions of hearing impairment, the trend was similar between males and females (figure 1). As concern the childhood age, the current worldwide burden of health loss in children aged 0–14 years is estimated at 3.13 YLDs in 2019 (i.e. 7.2% of YLDs across all ages and 10.0% of all causes of YLDs in childhood), with an increase of 2.0% during the past 10 years.

Discussion

Several important aspects have emerged from our analysis of the last update of the GHDx database (year 2019). The first notable observation, is that hearing loss represents the primary cause of YLDs (i.e. health loss) among all functional impairments listed in the GHDx database, being the foremost cause in males and the second in females. This makes hear loss a leading public health issue, ahead

of other more severely perceived functional impairments such as heart failure, intellectual disability and vision impairment.

The second important take-home message is that the health burden of this condition has considerably increased in both sexes during the past decade, by nearly 20%, especially in its milder forms. Notably, the variation over time displayed an almost perfect linear trend ($r=0.997$), which allows us to reliably forecast that the amount of health loss caused by any form of hearing impairment may increase by $\sim 2\%$ each year, whilst the yearly growth of YLDs due to complete hearing loss approximates 1%. This important evidence calls for broader recognition of this concerning healthcare issue, leading the way to reinforcing policies aimed at preventing the development of mild hearing impairments and/or progression toward more severe deficiencies, thus reiterating the need to increase the global attention to hearing impairment formulated a decade ago when earlier statistics had already unraveled and legitimized this health problem.⁶ This aspect is especially important if one considers that screening for hearing loss is not routinely conducted, nor are physical therapies always accessible to the entire general population due to the still relevant costs and the widespread perception of ineffectiveness.³

Supplementary data

Supplementary data are available at *EURPUB* online.

Conflicts of interest: None declared.

Data availability

Additional data will be available upon reasonable request to the corresponding author.

Key points

- Hearing impairment is causing 43.4 million Years Lived with Disability (YLDs).
- Hearing loss-attributable YLDs linearly increased by 18.7% during the past 10 years.
- Reinforced policies are needed for preventing and managing hearing loss.

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