Otolaryngology and the Global Burden of Disease

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KEYWORDS

• Global Burden of Disease • Disability-adjusted life years (DALY)
• Years lived with disease (LYD) • Hearing loss

KEY POINTS

- The Global Burden of Disease (GBD) project analyzes the comparative burden of all diseases to allow for appropriate allocation of health resources.
- GBD measures the all-cause mortality, years of life lost, the years of life lived with disability (YLD), and the combination of these in the disability-adjusted life years (DALYs) for multiple causes.
- The global burden of hearing loss is broken down into the sequelae of otitis media, meningitis, congenital causes, and to an age-related and other category.
- Hearing loss accounts for a significant disease burden globally with global YLDs comparable with diabetes and DALYs comparable with tuberculosis.
- Longitudinal data show a decrease in the incidence of head and neck cancers; however, thyroid cancer has become more prevalent without a corresponding increase in DALYs.

INTRODUCTION AND RELEVANCE TO OTOLARYNGOLOGY

The Global Burden of Disease (GBD) project provides a framework for analyzing the comparative burden of all diseases to allow for appropriate allocation of health resources. Measuring otolaryngologic contributions to the global burden of disease allows us to quantify the magnitude of health loss from these pathologies. Through the work of the GBD, there is a growing recognition that noncommunicable and surgical diseases, such as cancer and trauma, have a large impact on global health. This article introduces the basic methodology of the GBD and highlights the impact of this work on specific otolaryngologic conditions, such as hearing loss, otitis media, cleft lip and palate, head and neck cancer, oral disorders, and trauma.

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GLOBAL BURDEN OF DISEASE OVERVIEW

The GBD project is currently managed by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington. The goal of GBD is to objectively and independently estimate the morbidity and mortality of all major causes of health loss. The GBD uses descriptive epidemiologic analyses to compare the effects of different diseases, injuries, and risk factors across a comprehensive set of age, sex, and locations. Such comparisons allow health policy decision-makers an opportunity to see the major contributors to health loss in a given sector. The GBD does this by estimating the all-cause mortality, deaths by cause, years of life lost (YLLs) due to premature mortality, years lived with disability (YLDs), and disability-adjusted life years (DALYs) for a specified list of disease causes (known as the *cause list*). These metrics are updated and recalculated annually as new information comes to light. Therefore, the most accurate estimates possible are available across a time span dating back to the original studies and publicized by the GBD (**Fig. 1**). The GBD has publicized these results through more than 270 scientific articles in the last 10 years as well as numerous policy reports, Web content, and open-access interactive visualizations (vizhub.healthdata.org/gbd-compare).[1]

The GBD estimates have an egalitarian ethos; the fundamental comparison used for mortality and morbidity, a healthy year of life, holds the same value in all countries. Mortality is measured in years lost from a global standard of highest observed life expectancy. The morbidity of conditions is quantified using disability weights shared by all countries. Using a life expectancy tied not to location but to the longest life span achieved by people acknowledges that, although geography holds an outsized influence on life expectancy and health outcomes, this should not be the case and we must work to eliminate health disparity. This goal sets a high bar for achievement in health improvement goals. The GBD estimation process is highly interconnected; each year new data and revised methods improve results in all sectors of burden estimation.

BACKGROUND AND GROWTH OF THE GLOBAL BURDEN OF DISEASE PROJECT

The GBD was originally founded by Drs Christopher Murray and Alan Lopez, who recognized in the early 1990s that the sum of deaths attributed to specific causes was greater than the total number of global deaths per year. In an effort to address this discrepancy, they began working on a more cohesive estimate of worldwide deaths as well as the impact of nonfatal health outcomes. Their initial study showed a substantial impact on health from such dissimilar problems as heart disease, road injuries, and depression.[2] They derived DALY to enable comparisons of the burden of disease, both in terms of life lost and disability of nonfatal outcomes. The first peer-reviewed GBD articles were published in 1997, and the World Health Organization established a Disease Burden Unit in 1998. The GBD 2010 study represented a landmark for 2 reasons: First, it was a truly collaborative effort engaging a worldwide network of 422 researchers. Second, GBD 2010 collaborators revised estimates for the 20-year interval from 1990 to 2010, replacing what had been a snapshot of global health with a quantitative narrative of health trends over time (see **Fig. 1**). Each rendition of the GBD includes new data sources, refined methodology, and a more comprehensive and detailed list of diseases and risk factors.[3] The methodology of the GBD has also been incorporated into numerous studies to compare the cost-effectiveness of different health strategies and treatments.