

# Addressing Global Hearing Impairment in Low-Income Countries Such as Peru

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## Abstract

Hearing impairment is a significant problem that the World Health Organization (WHO) estimates affects approximately 278 million people worldwide.

- Of these, a greater proportion live in low-income countries.
  - Peruvian schoolchildren living in poverty are over 4 times more likely to have hearing deficits than children from higher-income countries. Another study shows that nearly 2% of Peru's population, or over 532,000 people, live with permanent hearing loss.

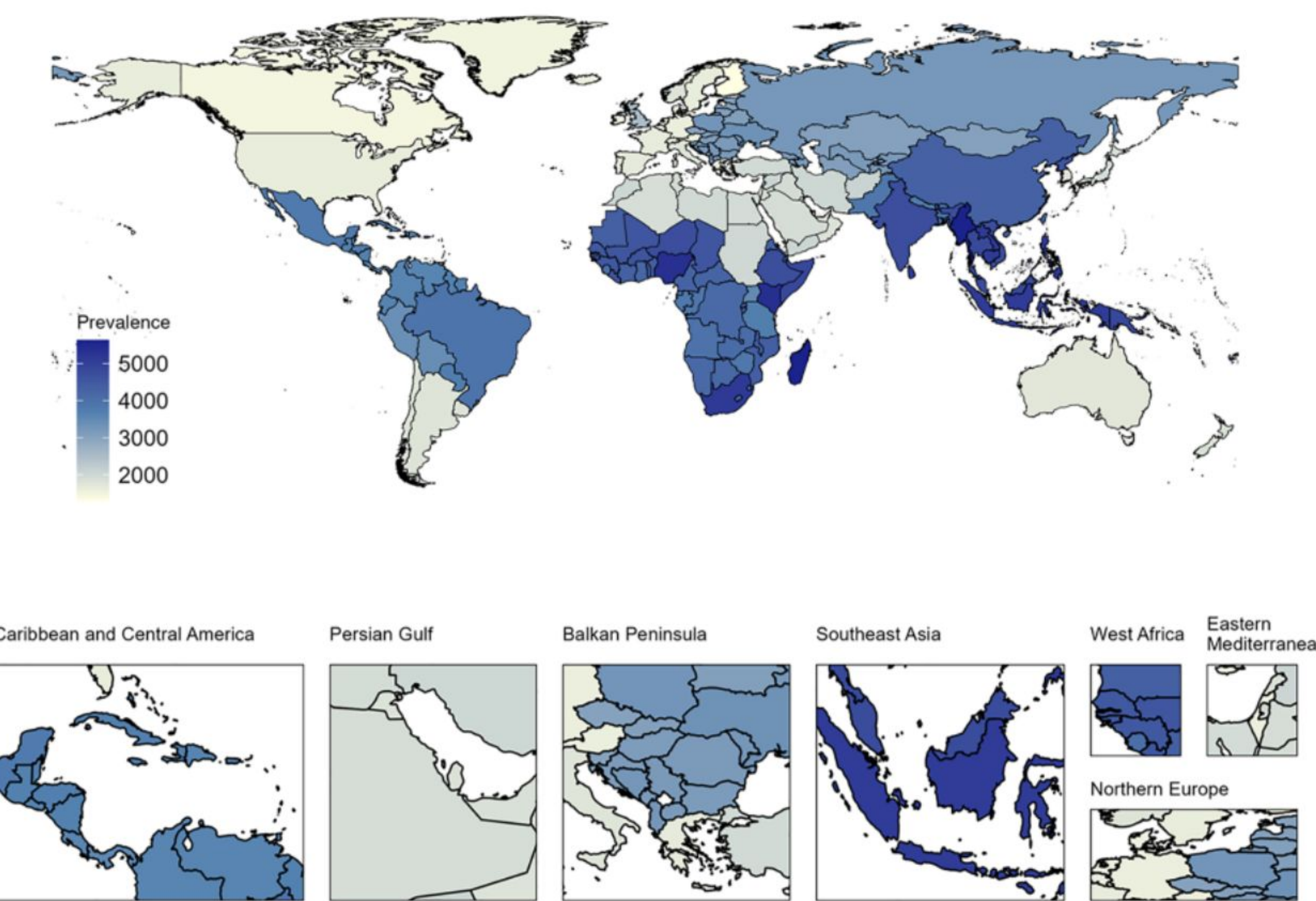
Addressing this disease burden in Peru is significant to global health initiatives, and doing so can elucidate methods for curtailing hearing loss in other low-income countries. Assisting in confronting this disease burden will involve:

- Understanding hearing loss prevalence
- Addressing shortages of physicians, especially otolaryngologists and audiologists
  - There is 1 ENT specialist per 33,961 people in the USA,
  - There is 1 ENT specialist per 45,000+ in Peru
- Increasing the availability of preventative measures
  - Screening children for otitis media and adults for early-onset hearing loss.
- Addressing societal risk factors such as noise pollution
  - Transportation noise, Commercial/Industrial noise
- Educating susceptible populations on healthy hearing and hearing loss prevention.
- Increasing the availability of treatment options,
  - hearing aids, cochlear implants, etc.

These methods help develop a holistic approach for addressing hearing impairment and expounding the role global health initiatives can play to assist.

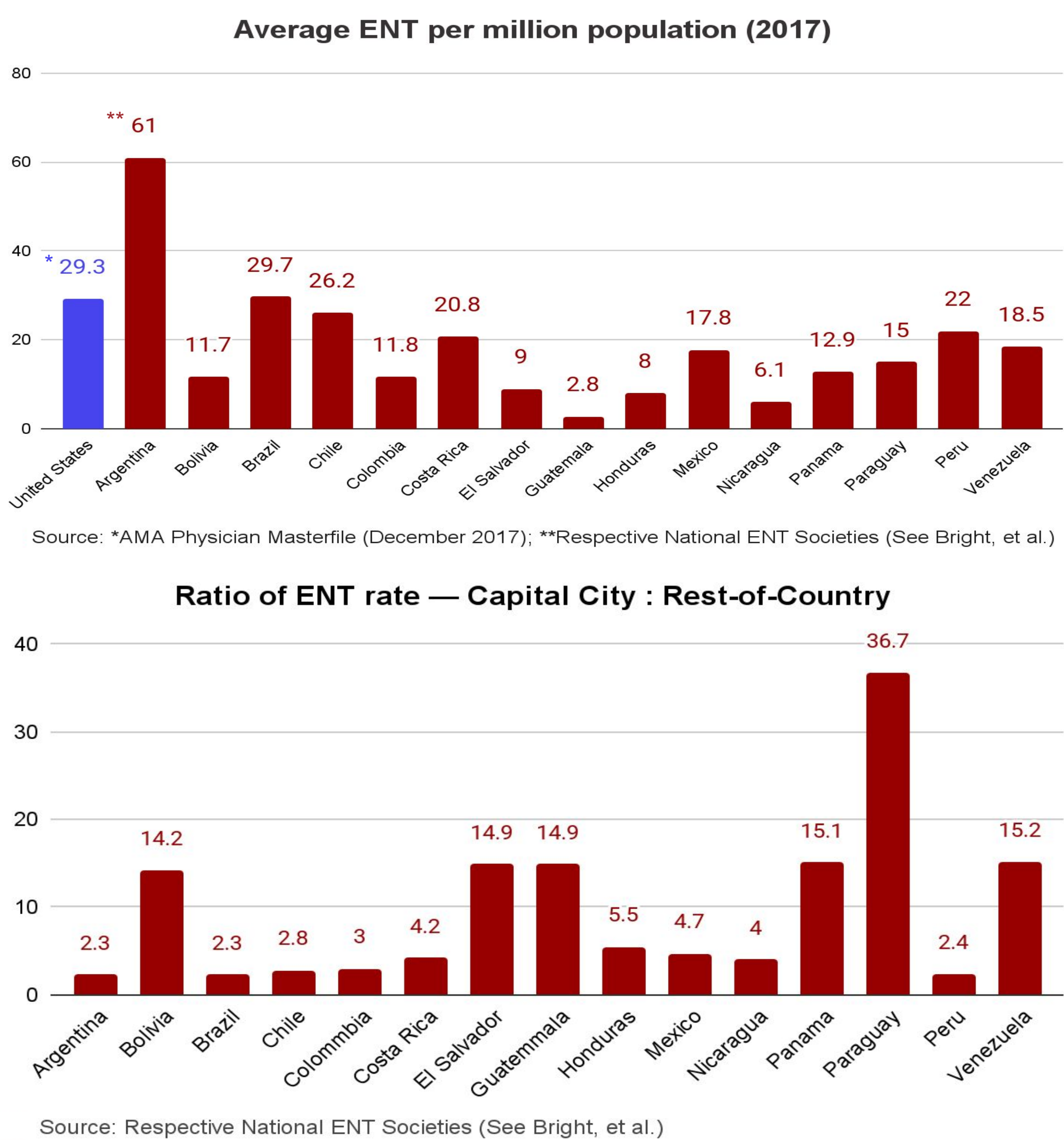
## Prevalence of Childhood and Adolescent Hearing Loss

### A Prevalence in 2019, per 100 000 population



Source: Global, Regional, and National Burdens of Hearing Loss for Children and Adolescents from 1990 to 2019: A Trend Analysis. Chen, et al.

## ENT Distribution

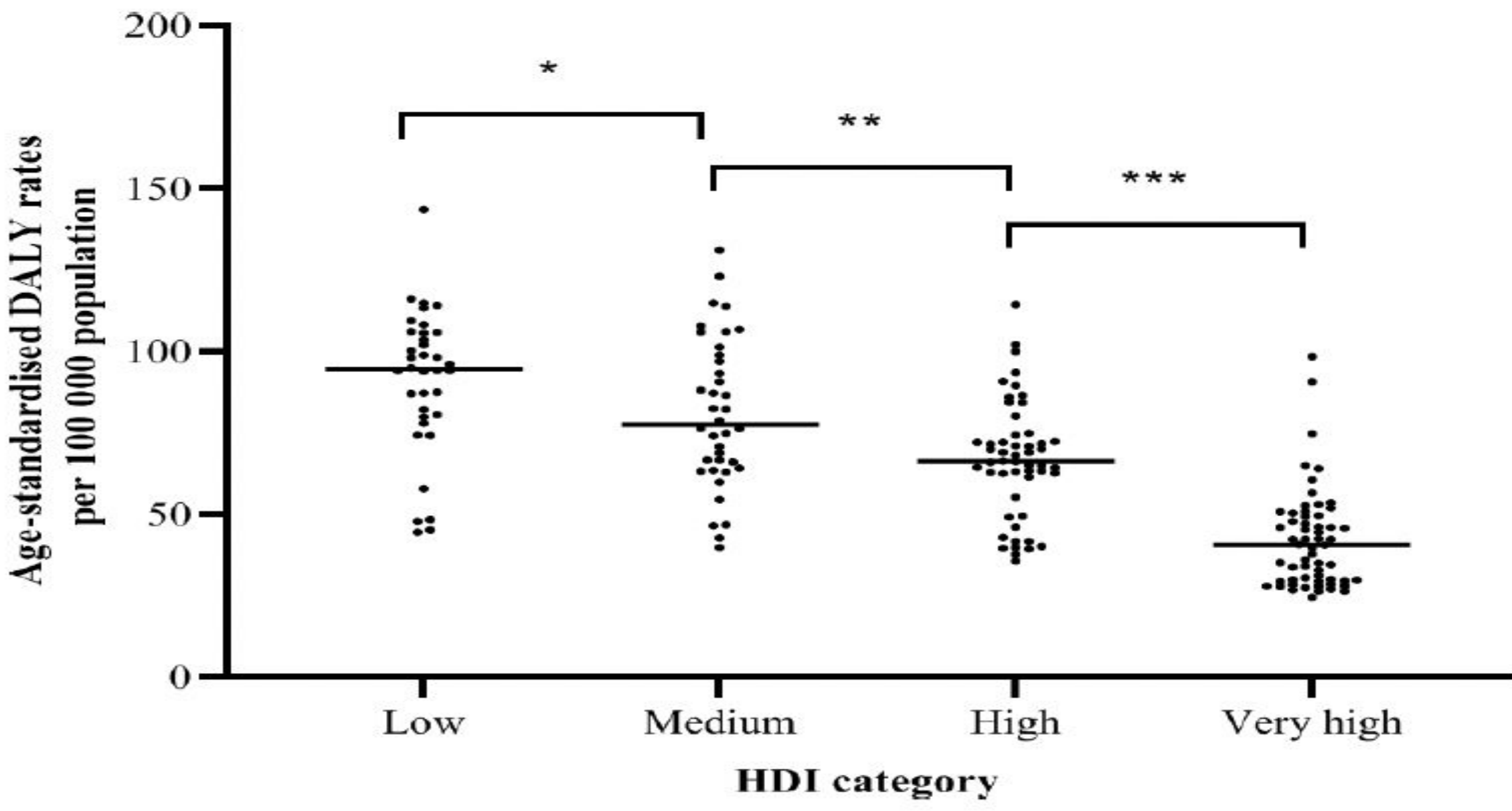


## Risk Factors of Hearing Loss in Peruvian Children

	<b>Hearing impairment and poverty: The epidemiology of ear disease in Peruvian schoolchildren by Czechowicz, et al.</b>
<b>p-Value</b>	<b>Risk Factors leading to hearing loss in untreated children</b>
0.015	Neonatal jaundice
0.0013	Seizure
0.003	Hospitalization due to trauma
0.002	Recurrent otitis media
0.003	History of otorrhea
0.026	Family history of hearing loss before age 35
<0.001	Tympanic membrane abnormality
<0.001	Cerumen impaction
<0.001	Eustachian tube dysfunction

Czechowicz, et al. hypothesized that hearing loss would negatively impact education, and they reported that hearing loss was a risk factor for academic concerns such as the need for remediation. The study reported approximately 6.9% of Peruvian children age 6-19 in their study suffered from hearing loss, and extrapolated that this demographic was 4-7 times more likely to have hearing impairment than similarly aged children in higher income countries like the USA and Japan.

## Effects of Noise Pollution



**Figure** The burden of occupational noise-induced hearing loss in terms of age-standardised DALY rates was significantly higher in the lower socio-economic group. Lines represent medians. DALY, disability-adjusted life-year; HDI, human development index. \*\*\*P<0.001, \*\*p<0.01, \*p<0.05.

Source: Socio-economic disparity in the global burden of occupational noise-induced hearing loss: an analysis for 2017 and the trend since 1990. Zhou, et al.

## Conclusions

- Hearing loss represents a greater disease burden in low- and middle-income countries and in younger populations.
- Density of ENT specialists in many Latin American countries is low, and concentrated in densely populated regions, increasing regional disparities in access to care.
- Addressing risk factors and providing rapid treatment are essential to reducing hearing loss in children.
- The disease burden of hearing loss due to occupational noise pollution is greater in lower income countries and the gap is widening.
- Advanced technology such as cochlear implantation is underutilized lower income countries and increased accessibility could improve treatment of advanced hearing loss.

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