

Cost-effectiveness of Hearing Aid Devices among Older Adults in India

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Recommendations

At the cost-effectiveness cut-off of 1 GDP (INR 2,31,784) for procurement in public health programmes, the proposed intervention is cost-effective.



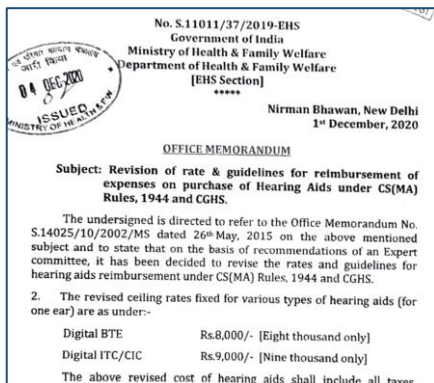
To ensure comprehensive hearing healthcare, it is imperative to integrate hearing health into national and state-level **geriatrics health policies and programs**, incorporating regular screening.



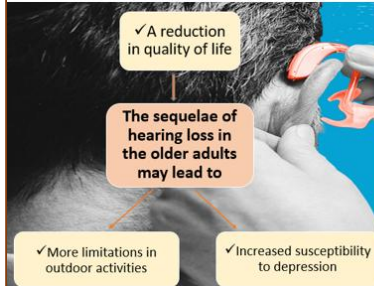
Ayushman Arogya Mandir's policy on ear, nose, and throat (ENT) care underscores the importance of community-based services, with medical officers and audiologists for successful implementation.



Recognizing the impact of hearing impairment on communication and mental well-being, **Senior Citizen Homes** must prioritize access to hearing aids.



Background



Age (Years)	≥60
Sample size	31,464
Prevalence	3155 (10.06%)
Impairment in single ear	34.77%
Impairment in both ears	65.23%
Treatment Received	9%

The National Program for the Prevention and Control of Deafness (NPPCD) was launched in 2006 to address **hearing loss** focusing on prevention, early diagnosis, and treatment. The use of hearing aids among the hearing-impaired older population enhances the quality of life; while sustained use ensures long-term **cost-effectiveness**.

Under NPPCD, individuals requiring interventions are referred to ENT specialists and audiologists at the district level, with hearing aids for hearing loss provided by the Ministry of Social Justice & Empowerment. However, the program lacks a dedicated **budget for hearing aids**, which demands the cost-effectiveness and budget impact of providing hearing aids to older adults in India.

Methods & Findings

P: Population

- Older adults (aged 60 years & above) diagnosed with hearing impairment.

I: Intervention

- Utilization of the conventional procedure for fitting hearing aids.

C: Comparator

- Older adults with hearing impairment who do not use hearing aids.

O: Outcomes

- Assessment of Costs per quality-adjusted life-year (QALY) gained.

T: Time horizon

- Evaluation over 3 years.

Parameters	Device cost (in INR)
Device Cost for single ear (A)	8,000.00
Device Cost for both ears (B)	16,000.00
Direct Medical Cost for Consultation (C)	4,368.00
Total Cost for Single Ear (A+C)	12,368.00
Total Cost for Both Ears (B+C)	20,368.00

ICER= Cost use HA – Cost not use HA / QALY use HA – QALY not use HA	ICER= Cost use HA – Cost not use HA / QALY use HA – QALY not use HA
$= 12368 - 1583 / 5.824 - 4.207$ $= 10785 / 1.617$	$= 20368 - 1583 / 5.824 - 4.207$ $= 18785 / 1.617$
<p>= INR 6,670 per QALY gain (for single ear)</p>	<p>= INR 11,617 per QALY gain (for both ears)</p>

Parameters	Population	Total (N)	Total
Number of Older Adults (60+) [Census 2011, predicted as on July 2022]	-	149000000	14.9 Crore
Prevalence of hearing impairment [Longitudinal Ageing Study in India, 2018]	10%	1,49,00,000	1.49 Crore
Need hearing aid among hearing-impaired older adults [Marbaniang et al. 2022]	4.7%	7,00,300	7 Lakhs
Prevalence of hearing impairment need hearing aid for one ear [LASI, 2018]	35.0%	2,45,105	2.45 Lakhs
Prevalence of hearing impairment need hearing aids for two ears [LASI, 2018]	65.0%	4,55,195	4.55 Lakhs
Cost per individual for single ear (for 3 years)		12368.00	
Cost per individual for both ears (for 3 years)		20368.00	
Total cost for single ear (for 3 years)		3,031,458,640.00	INR 303.1 Crore
Total cost for both ears (for 3 years)		9,271,411,760.00	INR 927.1 Crore
Total cost for hearing aid fitting (for 3 years)		12,30,28,70,400.00	INR 1230.2 Crore
Annual cost for fitting hearing aid		4,100,956,800.00	INR 410.0 Crore

Conclusion

- The study findings underscore the economic considerations associated with hearing aid provision for older adults in India. Over a three-year period, the cost per individual for fitting a hearing aid, priced at INR 8000 for Digital BTE, amounts to INR 11,420 for a single ear and INR 19,420 for both ears.
- The ICER/ QALY gained is INR 6,670 (0.03 times GDP per capita) for hearing aid fitting in one ear and INR 11,617 (0.05 times GDP per capita) per QALY gained for hearing aid fitting in both ears.

Budget Impact Analysis

The estimated total national cost for hearing aid provision over three years is approximately INR 1163.9 crore, translating to an annual expenditure of INR 387.9 crore for addressing the hearing needs of older adults in India.