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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

The 10-year Prevalence of Hearing Loss and Dementia Among People with HIV in the United States

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BACKGROUND

- As persons with HIV (PWH) age, they are at particular risk for sensorineural hearing loss (HL) and age-associated dementia (AAD).
- HL and AAD are prevalent and have considerable detrimental effects on quality of life.
- HL is a leading preventable risk factor for AAD worldwide.
- We used simulation modeling to estimate the prevalences of HL and AAD among PWH in the US over the next 10 years.

We project that the number of people with HIV aged 65 and older with hearing loss and/or age-associated dementia will double by 2033.

METHODS

- We developed the CHARMED microsimulation model of HIV and aging comorbidities in the US.
- We simulated a cohort of PWH engaged in HIV care and on antiretroviral therapy at age 60y using the CEPAC model.
- We incorporated incident AAD and HL, with an increased risk of AAD in people with HL; all PWH had an increased risk of AAD but no increased risk of HL.
- We projected age- and sex-stratified prevalences of HL and AAD, which we applied to model-projected numbers of PWH over age 65y across the next 10 years.

Table 1. Selected model inputs

Input parameter	Base case value		Reference
AAD-related inputs			
General population annual AAD incidence, (%)			
Age, years, mean (SD)	Male	Female	
60-64	0.4	0.3	
65-69	0.7	0.4	
70-74	1.0	0.8	[1]
75-79	1.7	1.6	
80-84	3.5	3.6	
85+	7.2	6.6	
AAD incidence rate ratio: PWH vs. general population			
	1.8		[2]
AAD incidence rate ratio: people with HL vs general population			
	2.0		[3]
HL-related inputs			
General population HL prevalence at age 60 (%)			
	Male	Female	
	28.5	12.2	[4]
General population annual HL incidence (%)			
Age, years	Male	Female	[5,6,7,8]
60-65	2.3	1.3	
66-75	5.4	3.8	
76+	10.4	9.2	

[1] Tom, *Am J Public Health*, 2015; [2] Lam, *AIDS*, 2016; [3] Huang, *JAMA*, 2023; [4] Derived using CEPAC; [5] Goman, *Am J Public Health*, 2016; [6] Homans, *Laryngoscope*, 2017; [7] Cruickshanks, *Am J Epidemiology*, 1998; [8] Van Naarden, *Pediatrics*, 1999

RESULTS

- From 2023-2033, the numbers of PWH aged 65y or older would increase substantially, and most would be living with HL, AAD, or both (Figure 1).
- By 2033, of 189,300 males with HIV, 75,700 (40%, red) would have HL alone, 9,700 (5%, blue) would have AAD alone, and 32,900 (17%, purple) would have both.
- By 2033, of 63,100 females with HIV, 17,700 (28%, red) would have HL alone, 3,400 (5%, blue) would have AAD alone, and 7,400 (12%, purple) would have both.
- In sensitivity analysis, the number of AAD cases is most sensitive to variations in AAD incidence, while the number of HL cases is most sensitive to acceleration and deceleration of HL incidence (Figure 2).

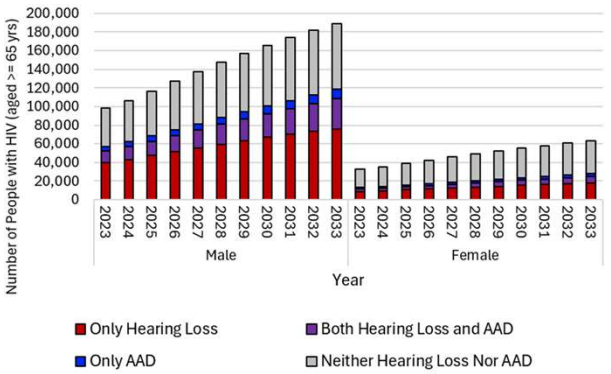


Figure 1. The 10-year prevalence of hearing loss and/or AAD among persons with HIV aged 65y or older in the US. Abbreviations: AAD, age-associated dementia

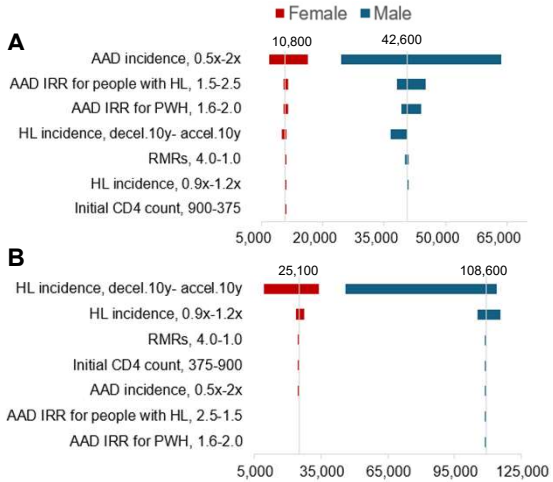


Figure 2. Projected number of PWH aged 65y or older with AAD **(A)** or HL **(B)** in 2033. Abbreviations: AAD, age-associated dementia; HL, hearing loss; IRR, incidence rate ratio; PWH, persons with HIV; RMR, relative mortality ratio

CONCLUSIONS

- The number of PWH over 65y with hearing loss and AAD in the US will double over the next decade.
- Data are needed on the increased risk of HL in PWH and the impact of HL treatment specifically in PWH.
- Prevention and treatment efforts, as well as increasing support services for PWH who have AAD and HL, potentially through programs like Ryan White, should become higher priorities.

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