

## **Project Proposal**

### **Improving Communication for People with Hearing Loss**

#### **A Growing and Urgent Problem**

One of every 5 Americans, 48 million, have significant hearing loss<sup>1</sup>, and this number is expected to grow to nearly double by the year 2030. The prevalence of chronic hearing loss rises steeply with age, from 30% among adults 45 to 60 years of age to 40% among adults aged 65-74, and 56% percent among adults who are 75 and older<sup>2</sup>. This makes hearing loss the third most prevalent chronic medical condition among older adults after arthritis and hypertension<sup>3</sup>. Hearing impairment is highly prevalent in older adults (nearly half of population over age 75) and is associated with social isolation, depression, risk of dementia, higher risk of falls and increased mortality.

#### **A Majority of Americans With Hearing Loss Do Not Get Treatment, At Risk**

The vast majority of hearing loss (95%) is permanent and irreversible but can be treated effectively with a variety of hearing devices such as hearing aids, yet 80% of people with hearing loss who could benefit from a hearing aid do not wear one<sup>4</sup>, thought to be due to the stigma associated with hearing loss and the high cost of hearing aids. And the average time between initial diagnosis and when people get a hearing aid is 7-10 years<sup>5</sup>. Untreated hearing loss is associated with comorbidities including decreased communication ability, functional and psychosocial impairments<sup>6</sup>, cognitive decline<sup>7</sup> and physical disability<sup>8</sup>.

#### **Hearing Loss and Social Engagement**

Hearing loss tends to decrease verbal communication ability, an important source of human intimacy and may lead to social isolation and loneliness. Social isolation and loneliness are considered risk factors for mortality, perhaps mediating the relationships among hearing loss, cognitive decline, and mortality. However, previous studies examining the association between hearing loss and loneliness have not yet produced conclusive results. Some studies reported significant associations between hearing status and loneliness<sup>9,10,11,12</sup>, whereas others found none<sup>13,14,15</sup>.

The potential for treatment with hearing aids and other hearing devices in combination with improving the acoustics in the environment that affect hearing ability to serve as a buffer against social disengagement and emotional loneliness has not been fully explored. To date only one study has examined the buffering effects of hearing aid use on social and emotional loneliness<sup>16</sup>.



## Impact on Work and School

In the workplace, hearing loss has a significant negative impact on earnings: those with untreated hearing loss have lower earnings<sup>17</sup>. At school, a child with even mild hearing loss can miss as much as 50% of classroom discussion<sup>18</sup>. In addition to hearing aids and other personal listening devices, the acoustics of the various environments strongly influence the ability to hear for those with hearing loss. A poor acoustic environment is a barrier for people with hearing loss as much as a set of stairs is a barrier for people in wheelchairs. Room acoustics have a major effect on the transmission of speech sounds from talker to listener<sup>19</sup>, and the ability to communicate effectively and the ability to hear programs in public spaces.

## The Plan

In 2017, the Stanford Center on Longevity will launch a program that supports research on key unanswered questions about hearing loss and social engagement. The aim of the project is to identify areas for future research as currently, limited research has examined the impact of hearing loss, whether treated with devices or not, and the related effects on social engagement.

We will begin by convening a small group of distinguished experts who represent medicine, engineering, psychology, sociology, law, government, health economics, health policy, industry, technology and advocacy to elaborate key issues, compile existing evidence and identify questions to which answers are needed in order to guide research, inform policies and improve products and services.

The SCL has developed a model of “launch” conferences that is different from a traditional academic meeting: instead of focusing on what experts have learned and know as a means of sharing scholarship, a launch conference is a means of identifying new opportunities for advances in scholarship, policy, and practice, by focusing on what experts don’t know and should learn, and how. Launch conferences consist of directed discussions based on clear and results-oriented agendas. The goal is to address key questions that lead to consensus-building and concrete next steps. We would identify the key areas of focus for future research.

The Hearing Project at the Stanford Center on Longevity will include developing research and policy program around the following questions:

Access, Prevention and Education:

- How can we increase access to hearing aids and other hearing devices? How might we simplify and clarify the choices of obtaining this technology?
- How can we increase the use of hearing aids and other hearing devices? Do we know all of the reasons why people are not using them? What interventions can help remove the barriers to using hearing devices?
- What is the best way to educate the population on the prevention of hearing loss as well as the effects of untreated hearing loss? What can we do to educate users on all the technical features of hearing aids, and how they can interact with other devices?



Technology:

- Do we need to develop new technologies that accommodate diverse situations? Or are there current technologies that exist but are not yet being used optimally in service to the hearing impaired?

Policies:

- What are the means by which we can develop and support policies that allow for greater access to contemporary innovative hearing aids and other hearing devices?
- What can be done to support policies for improving the integration of assisted listening devices in public spaces?

Acoustics and Built Environments:

- How can we make acoustics in noise-sensitive areas more inclusive and create more optimal acoustic environments for conversation and social engagement?
- How can we encourage architects, developers and builders to incorporate technology specifically designed to decrease acoustic barriers in their site planning, architectural design, and construction methods?

The results of this project will provide actionable insights into the usage, technology, and policies related to greater adoption of hearing aids and other hearing devices, and as well as related methods for acoustically improving an environment. Further, the results of this project will provide insights into the buffering effects of hearing devices and improved acoustics in noise-sensitive areas on improving communication ability among individuals with varying degrees of hearing loss. Data and resources collected by the Hearing Project may serve as a starting point for sources of information applicable to hearing device adoption and determine future research. Ultimately, the Hearing Project seeks to improve overall psychological, physical, and cognitive well-being of hearing-impaired populations.

Following the meeting, the project will seed pilot research on identified topics and convene practitioners, patients, and other stake holders to develop a strategic plan to improve communication for those with hearing loss in America.



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- <sup>1</sup> [http://www.hearingloss.org/sites/default/files/docs/HearingLoss\\_Facts\\_Statistics.pdf](http://www.hearingloss.org/sites/default/files/docs/HearingLoss_Facts_Statistics.pdf)
  - <sup>2</sup> <http://www.amplifonusa.com/hearing-loss>
  - <sup>3</sup> Lethbridge-Cejku, M., Schiller, J. S., and Bernadel, L. (2004). Summary health statistics for U.S. adults: national health interview survey, 2002. *Vital Health Stat.* 10, 1–151.
  - <sup>4</sup> [http://www.hearingloss.org/sites/default/files/docs/HearingLoss\\_Facts\\_Statistics.pdf](http://www.hearingloss.org/sites/default/files/docs/HearingLoss_Facts_Statistics.pdf)
  - <sup>5</sup> [http://www.hearingloss.org/sites/default/files/docs/HearingLoss\\_Facts\\_Statistics.pdf](http://www.hearingloss.org/sites/default/files/docs/HearingLoss_Facts_Statistics.pdf)
  - <sup>6</sup> Bess, F. H., Lichtenstein, M. J., Logan, S. A., Burger, M. C., & Nelson, E. (1989). Hearing impairment as a determinant of function in the elderly. *Journal of the American Geriatrics Society*, 37(2), 123-128.
  - <sup>7</sup> Lin, F. R., Yaffe, K., Xia, J., Xue, Q. L., Harris, T. B., Purchase-Helzner, E., ... & Health ABC Study Group. (2013). Hearing loss and cognitive decline in older adults. *JAMA internal medicine*, 173(4), 293-299.
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  - <sup>9</sup> Hawthorne, G. (2008). Perceived social isolation in a community sample: its prevalence and correlates with aspects of peoples' lives. *Social psychiatry and psychiatric epidemiology*, 43(2), 140-150.
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  - <sup>11</sup> Strawbridge, W. J., Wallhagen, M. I., Shema, S. J., & Kaplan, G. A. (2000). Negative consequences of hearing impairment in Old Age a longitudinal analysis. *The Gerontologist*, 40(3), 320-326.
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  - <sup>13</sup> Berg, S., Mellström, D., Persson, G., & Svanborg, A. (1981). Loneliness in the Swedish aged. *Journal of Gerontology*, 36(3), 342-349.
  - <sup>14</sup> Kivett, V. R. (1979). Discriminators of loneliness among the rural elderly: Implications for intervention. *The Gerontologist*, 19(1), 108-115.
  - <sup>15</sup> Nachtegaal, J., Smit, J. H., Smits, C. A. S., Bezemer, P. D., van Beek, J. H., Festen, J. M., & Kramer, S. E. (2009). The association between hearing status and psychosocial health before the age of 70 years: results from an internet-based national survey on hearing. *Ear and hearing*, 30(3), 302-312.
  - <sup>16</sup> Weinstein, B. E., Sirow, L. W., & Moser, S. (2016). Relating Hearing Aid Use to Social and Emotional Loneliness in Older Adults. *American journal of audiology*, 25(1), 54-61.
  - <sup>17</sup> [http://www.hearingloss.org/sites/default/files/docs/HearingLoss\\_Facts\\_Statistics.pdf](http://www.hearingloss.org/sites/default/files/docs/HearingLoss_Facts_Statistics.pdf)
  - <sup>18</sup> [http://www.hearingloss.org/sites/default/files/docs/HearingLoss\\_Facts\\_Statistics.pdf](http://www.hearingloss.org/sites/default/files/docs/HearingLoss_Facts_Statistics.pdf)
  - <sup>19</sup> Boothroyd, A. (2004, May). Room acoustics and speech perception. In *Seminars in Hearing* (Vol. 25, No. 02, pp. 155-166). Copyright© 2004 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA..