



JOHNS HOPKINS  
BLOOMBERG SCHOOL  
*of* PUBLIC HEALTH

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**COCHLEAR CENTER FOR  
HEARING AND PUBLIC HEALTH**

# **2021-2022 Annual Report**



# Greetings!

In the four years since the Cochlear Center for Hearing and Public Health began, our efforts have gathered momentum.

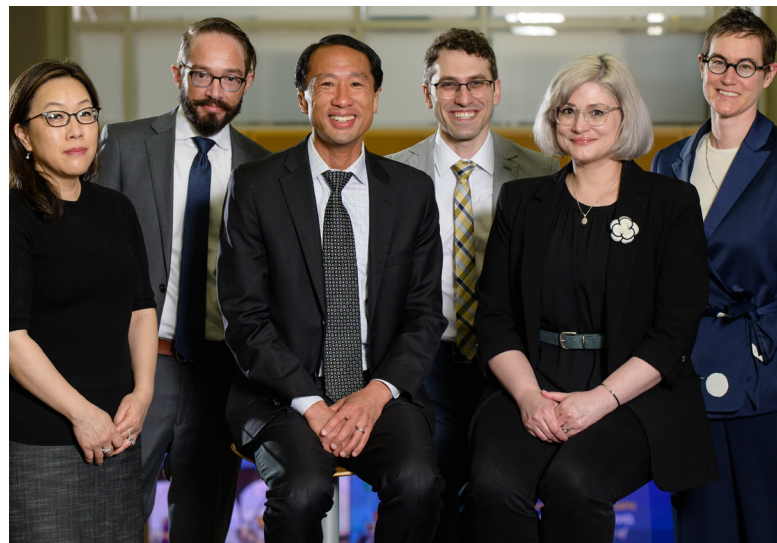
**Our training continues to grow** — mentoring opportunities remain sought-after, we attract exceptional cohorts of trainees, and our reconfigured and expanded international training programs allow us to continue that work despite changing travel restrictions.

**We are also nearing the cusp of seeing the results of our larger research and policy initiatives.** Our large epidemiological studies and clinical trials continue, with one trial testing the efficacy of a community health worker model of hearing care delivery now completed, and a major study examining whether treating hearing loss reduces dementia risk nearing completion. Policy work to update the U.S.'s outdated historical policies around hearing healthcare has resulted in two of the biggest developments in hearing care policy in decades: the FDA's imminent final regulations for over-the-counter hearing aids and the inclusion of a Medicare hearing benefit in the Biden Administration's Build Back Better legislation. And our first public health campaign, aimed at establishing a universal, neutral metric for hearing, is coming to life with evolving opportunities to work with industry and non-profit partners to broaden that impact.

I am delighted to highlight these initiatives as well as other select activities from the past academic year in this annual report. Your support makes it possible — thank you.



Frank R. Lin, MD, PhD  
Director, Cochlear Center  
for Hearing and Public Health



Cochlear Center Faculty. (From Left) Esther Oh, MD, PhD, Josh Betz, MS, Frank Lin, MD, PhD, Nick Reed, AuD, Jennifer Deal, PhD, Carrie Nieman, MD, MPH (Not pictured: Bonnielin Swenor, PhD, MPH)



Cochlear Center Staff. (Front) Kening Jiang, MHS; Molly Sheehan; Tara Thallmeyer, MPH, (Second Row) Jami Trumbo, MPH; Shannon Smitherman, (Third Row) Clarice Myers, AuD; Roxanne Clement-Rorick, MPH; Mindy Dmchowowski, (Back) Emmanuel Garcia, PhD; John Shin, MPH (Not pictured: Laura Sherry, AuD)



Trainees 2021-2022 L-R: (Front) Abigail Oliva, MPH; Kelly Malcolm, AuD, MPH; Claire Anderson, MHS, (Back) Wuyang Zhang, MHS; Ethan Wang; Jon Suen, AuD; Eric Du; Elizabeth Kolberg, AuD, MS; Jason Smith, ScM

# Trainees and Training Programs

To develop and implement public health strategies and solutions for hearing loss, the Cochlear Center is training a generation of clinicians and researchers to study the impact that hearing loss in older adults has on public health.

Our trainees are graduate students, audiologists, physicians, and medical students drawn from around the world who work with Cochlear Center mentors on research that illuminates the connections between sensory loss and healthy aging.

## TRAINING BY THE NUMBERS



**12 trainees in the academic year, 27 since 2018**



**10 trainee presentations**



**9 trainee papers published in Cochlear Center mission areas**



**4 upcoming trainee submission papers in Cochlear Center mission areas**



**8 journal clubs**

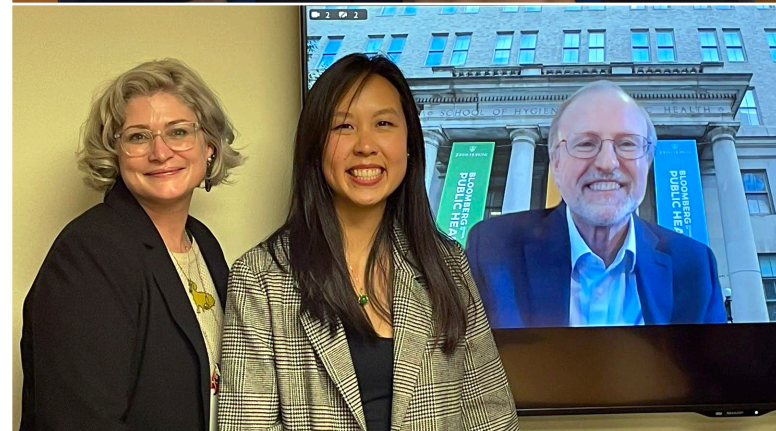


**6 graduations**

Alison Huang, PhD, Jason Smith ScM, Claire Anderson MHS, Abigail Oliva MPH and Wuyang Zhang MHS, Maggie Oliver MPH

## TRAINING HIGHLIGHTS

- PhD candidate **Jon Suen, AuD** is one of 6 (from 200+ applicants) chosen for the American Journal of Public Health Think Tank student fellowship on science communications to promote public health.
- Postdoctoral fellow **Kelly Malcolm** won 3rd place in the Johns Hopkins Bloomberg School of Public Health's 15th Annual Research on Aging Showcase poster competition for her paper "Satisfaction with Care and the Association with Hearing Loss, Hearing Aids, and Race."
- Trainee **Maggie Oliver**, mentored by **Jennifer Deal, PhD**, received a Johns Hopkins Bloomberg School of Public Health MPH Capstone Award for outstanding achievement for "Hearing Loss as a Modifier of the Association between Comorbidities and Mortality Over Time."
- Congratulations to Cochlear Center Epidemiology Scholarship for Sensory Loss in Aging recipients **Wuyang Zhang, Claire Anderson, Grace Gahlon, and Jason Smith**. This new scholarship supports master's (MHS or ScM) students in the Bloomberg School's Epidemiology department who are preparing for a career in research, public health policy, or advocacy around sensory loss in aging with a focus on hearing.
- AAS meeting: Cochlear Center faculty and trainees attended the American Auditory Society's 49th Annual Scientific & Technology Conference in Scottsdale, AZ, in February. Faculty shared four podium presentations, and trainees presented 12 posters on dual-sensory loss, cognition, mental health, hearing health equity, satisfaction with care, and other sensory loss topics.



# Training Programs and Events

## BY THE NUMBERS



**5 seminars**



**9 SENSE Network meetings**

## PROGRAMS AND EVENTS

### **CHAMP**

The inaugural offering of the revamped Cochlear Center Hearing & Aging Mentoring Program was an intensive, one-week virtual program designed for pre-doctoral audiology, medical, or public health doctoral students to gain a foundation in concepts and methods. This year's program resulted in 2 published papers.

### **Seminar Series**

Our popular seminar series featured eight speakers who shared expertise on dementia, delirium, access to hearing care in rural communities, mental health, social isolation, and global concerns in hearing care.



### **Disability in Public Health Seminar Series**

This seminar series, new in 2021 and led by Bonnielin Swenor, PhD, MPH and Jennifer Deal, PhD, featured speakers who presented on the origins and current landscape of disability health research with a focus on including the perspectives of people with disability.

### **The Summer Fellows Program in Hearing and Public Health**

In 2021, 18 Latin American Fellows from Argentina, Brazil, Chile, and Mexico completed five learning modules, heard 27 on-demand lectures, and put forth an estimated 20 hours of work to complete the on-demand lectures and assignments. The program concluded with synchronous virtual sessions with Center faculty that covered topics including clinical trials, hearing health policy, cognition & gerontology, and developing new models of hearing care.

In 2022 we are partnering with Chulalongkorn University and former Cochlear Center trainee Nattawan Utoomprurkporn, MD, MSc, PhD to take the program to Bangkok, Thailand.

### **Research Day 2022**

At Cochlear Center Research Day on April 25, faculty shared presentations about hearing loss, healthy aging and dementia, early insights from the HEARS study about hearing health equity, modern methodology for hearing-related studies, and the connection between hearing loss and health care. Natalie Phillips, PhD of Concordia University offered the keynote address, “Sensory Function and its Relationship With Cognition, Brain Imaging, and Dementia.” Research Day concluded with a poster session showcasing Cochlear Center researchers’ and trainees’ work in hearing and dual-sensory losses and aging.





# Global Reach of Research

At the Cochlear Center, whether through Center-led research, by bolstering inclusion of hearing in population health studies around the globe, or by disseminating analytic methods developed by the Center's Audiology & Analytical Cores, we are working toward a world where studies of older adults routinely consider hearing, use established methodology for hearing measurement and analysis, and yield robust evidence.

*Locations include: New York City, Boston, Salem, Amherst, Baltimore, Pittsburgh, Tampa, Jackson, San Antonio, Minneapolis, Seattle, Toronto, New Brunswick, Sao Paolo, Santiago, London, Rotterdam, New Delhi, Bangkok, Taiwan, Beijing, Sydney*



*The SENSE Network, started in 2020, is helping to build an infrastructure that supports international sensory aging research efforts.*

# Research Highlights

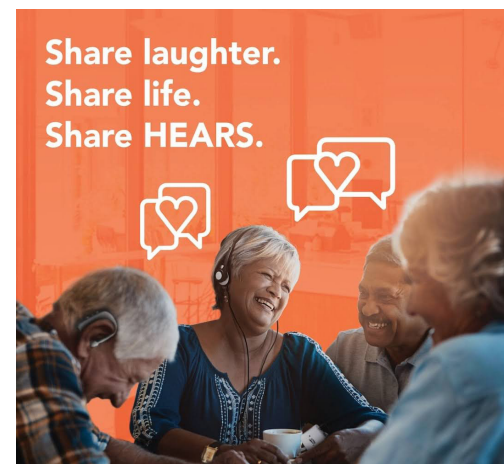
**Two of the Cochlear Center's large clinical trials are nearing completion. Both are potentially landmark studies that will influence our understanding of the impact of hearing loss treatment and how hearing care can be delivered.**

The Baltimore Hearing Equity through Accessible Research and Solutions, or HEARS study, (N = 151) led by core faculty Carrie Nieman, MD, MPH, is a first-in-kind affordable, accessible, and community-delivered hearing care intervention that uses community health workers to deliver hearing care to underserved older adults in 13 study locations. Preliminary results show a mean improvement of 13 points on the HHIE, a common metric used to assess hearing handicap, which is on par with improvements seen with hearing aids fitted by audiologists. Investigators anticipate Baltimore HEARS study results will be published in late 2022.

The Aging and Cognitive Health Evaluation in Elders (ACHIEVE) study is a first-in-kind, ongoing randomized controlled trial led by Cochlear Center faculty that will definitively determine if treating hearing loss versus a successful aging education control program reduces the risk of cognitive decline and dementia. Study participants aged 70-84 years with mild-to-moderate hearing loss (n=977) were enrolled across 4 sites in the U.S. from 2018-2019 and are now being followed for 3 years. Final study results from this definitive trial will be published in 2023. This \$21M study is sponsored by the National Institute on Aging.



**Access more 2021-2022 research publications by Cochlear Center faculty, research staff, and trainees.**





# Public Health Campaign: Know Your Hearing Number

The Cochlear Center has begun a public health campaign aimed at establishing the four-frequency pure tone average, or Hearing Number, as the right metric to improve the way people communicate about hearing loss.

This phased campaign has gotten underway at the convergence of larger public policy conversations about hearing loss and hearing care, an aging society with increasing hearing loss, and a new market for over-the-counter hearing aids.



## Dec 2020

- Frank Lin and Nick Reed co-author a Viewpoint in JamaOTO: “The Pure-Tone Average as a Universal Metric-Knowing Your Hearing.”

## Aug 2021

- The Cochlear Center engages Washington, DC-based agency Hager Sharp as communications partner for the campaign.

## May 2022

- Campaign look/feel finalized.

## Jul 2022

- Anticipated launch of the Cochlear Center-branded and consumer-focused campaign microsite planned to coincide with FDA release of final OTC hearing aid guidelines.

## Fall 2022

- Initiate an industry consortium that will encourage members to collaborate on standards for how to use the Hearing Number in their products, outputs, user interfaces, and messaging.

## Year 2

(Q3/22)

- Engage non-profit partners (AARP, HLAA, others) in a consumer-focused PR/social media campaign to empower consumers understand their hearing loss in time as OTC hearing aids come to market.

# Work in Hearing Healthcare Policy

Cochlear Center faculty led by Frank Lin have used academia, policy briefs, earned media, and frequent communication between Center faculty and Congressional policy staff to promote updates to Medicare’s limited coverage options for the treatment of hearing loss. That persistence was rewarded over this past year with two of the biggest developments in U.S. hearing care policy in decades: the FDA’s imminent final regulations for over-the-counter hearing aids and the inclusion of hearing care in the Biden Administration’s “Build Back Better” legislation.

While the Build Back Better Act stalled in the U.S. Senate, Center faculty are optimistic that with the framework of this Medicare hearing benefit now in place this effort will be able to be resurrected in future sessions of Congress.

## 2014

- Frank Lin initiates and chairs a National Academies of Sciences, Engineering, and Medicine (NASEM) workshop on hearingloss and healthy aging.

## 2015

- Frank Lin and Nick Reed advise the White House President’s Council of Advisors on Science and Technology on their report that recommends the OTC hearing aid regulations.

## 2016

- Frank Lin is a member of the NASEM consensus study on Accessible and Affordable Hearing Care for Adults recommending OTC hearing aid regulations





## 2017

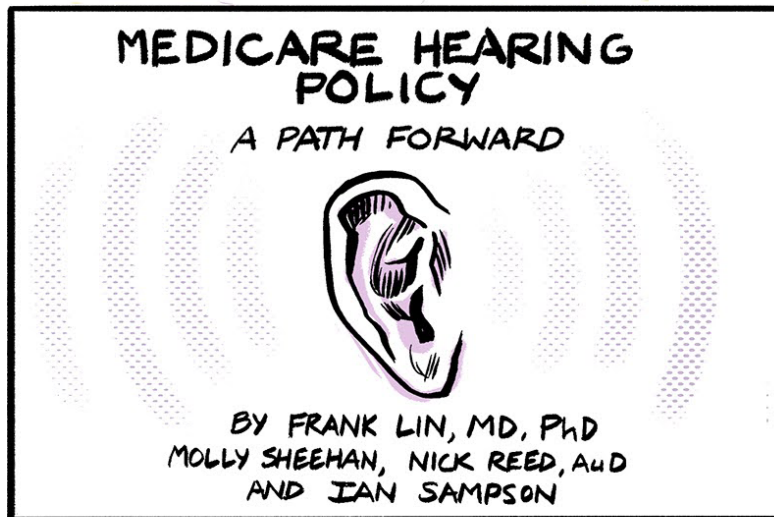
- Frank Lin testifies before the United States House of Representatives outlining ways to improve regulation of hearing technologies.
- The Over-the-Counter Hearing Aid Act passes with bipartisan support and requires the Food and Drug Administration to create a regulatory classification for over-the-counter hearing aids, which will dramatically alter access to and the cost of hearing technologies in this country.

## 2019

- Cochlear Center faculty Amber Willink asked to draft memo for the House of Representatives about coverage options for a Medicare hearing benefit. This language is pulled directly into the Medicare Hearing Act of 2019 (H.R. 4618), which was later incorporated into the broader Lower Drug Costs Now Act (H.R. 3) and passed by the House of Representatives in December 2019. This bill does not pass the Senate.

## 2020

- Cochlear Center shares high-level policy briefs illustrating the gaps and opportunities in Medicare coverage of hearing care and hearing aids with legislative directors and health policy advisors for Senators and Representatives; budget analysts at the Congressional Budget Office; NASEM; others.



## 2021

- Cochlear Center shares a ‘graphic narrative’ illustrating the challenges Medicare beneficiaries face in trying to get hearing care services and hearing aids with legislative directors and health policy advisors for Senators and Representatives; budget analysts at the Congressional Budget Office; and, more broadly, via non-profit partners.
- Earned media: with two Op-Eds by Frank Lin and collaborators (STAT News: Making hearing aids affordable isn’t enough. Older adults also need hearing care services and Health Affairs Blog: Dementia Policy is a National Priority. That’s Why Congress Needs to Expand Medicare to Cover Hearing Aids) and a piece by Jane Brody for the New York Times, “Will Hearing Aids Ever Be Hip?”
- The Food & Drug Administration releases draft guidelines for over-the-counter hearing aids.
- Language from H.R. 3 serves as the basis for the Biden Administration’s \$1.75T Build Back Better Framework to fund coverage of hearing aids and hearing care services under Medicare, the first time that explicit federal funding has been proposed for hearing coverage since the inception of Medicare in 1965.
- Center Director Frank Lin and Associate Faculty Marilyn Albert served on the workgroup for the National Alzheimer’s Project Act that developed recommendations regarding the need to address modifiable risk factors for dementia: Action 6.B.2 of the updated National Plan to Address Alzheimer’s Disease, specifically calls for increasing access to hearing aids to reduce dementia risk.

## 2022

- The FDA’s eventual final guidelines for over-the-counter hearing aids will open a new market for consumer hearing technology.
- Next: a National Academies workshop initiated by Frank Lin on the role of insurance coverage for hearing care in the era of over-the-counter hearing aids.

# Funding: Grants and Philanthropic Support

The Cochlear Center for Hearing and Public Health is supported by NIH grants to Center faculty, a gift from Cochlear Ltd., other philanthropic funding, and infrastructural support and resources from the Johns Hopkins Bloomberg School of Public Health and the Johns Hopkins University School of Medicine.

## Grants for which Cochlear Center for Hearing and Public Health core faculty are principal investigators:

- 12/01/2015-11/30/2022 (NCE) *Implementing a Community Health Worker Model for Providing Hearing Healthcare Services to Older Adults*  
NIH/NIDCD R33DC015062 \$2,494,615  
PI: Frank Lin
- 03/01/17 – 02/28/22 *Vision Loss and Cognition: Testing the Sensory Loss Consequence Hypothesis*  
NIA/NIH, 1K01AG052640-01; \$672,260  
PI: Bonnie Swenor
- 06/01/2017-05/31/2022 *Aging, Cognition, and Hearing Evaluation in Elders (ACHIEVE) Randomized Trial*  
NIH/NIA R01AG055426 \$15,426,522  
MPI: Frank Lin, Josef Coresh
- 08/15/17 – 05/31/22 *Role and Mechanism of Hearing Impairment in Dementia and Cognitive Decline*  
NIH/NIA K01AG054693; \$673,807  
PI: Jennifer Deal
- 4/1/2018-3/31/2023 *Accessible Hearing Care for Reduction of Disruptive Behaviors and Caregiver Burden in Dementia*  
NIH K23AG059900 \$991,505  
PI: Nieman
- 09/01/2018 – 11/30/2022 *NCE Community-Delivered, Affordable, Accessible Hearing Care to Reduce Symptom Burden in Alzheimer's Disease: Adaptation of the HEARS Intervention*  
NIDCD R33DC015062 S1 Admin supplement \$404,580  
PI: Frank Lin
- *Diversity Supplement: Extending Affordable, Accessible, Community-Delivered Hearing Care to Home Care*  
NIDCD/NIH , R33 DC015062-05S1; \$87,749 PI: Frank Lin
- 09/01/2018-05/31/2023 *Hearing Loss, Brain Aging and Speech-In-Noise Performance in the ACHIEVE Study*  
NIA 1R01AG060502 \$3,165,191  
PI: Frank Lin
- 02/01/2019-11/30/2023 *Contribution of Sensorimotor Function to Risk and Pathogenic Mechanisms of Alzheimer's Disease and Related Dementias*  
NIA R01AG061786 \$3,668,824  
MPI: Jennifer Schrack, Yuri Agrawal, Frank Lin

- 06/01/2019-05/31/2022 *Aging, Cognition, and Hearing Evaluation in Elders (ACHIEVE) Randomized Trial — Administrative Supplement*  
NIH/NIA R01AG055426 S1 Administrative Supplement \$1,159,601  
MPI: Frank Lin, Josef Coresh
- 12/01/2019 – 11/31/2024 *The Role of Hearing Loss in Health Care Outcomes*  
NIH/NIA K23AG065443 \$942,847  
PD/PI: Reed, Nicholas
- 2019 – 2021 *Measurement of Cognitive Function in Older Adults with Sensory Loss*  
NIH/NIA R21 \$150,000  
MPI: Jennifer Deal, Bonnielin Swenor
- 07/01/2020 – 06/30/2022 *Understanding and Addressing the Impact of Hearing Loss on Older Adults*  
Eleanor Schwartz Foundation 90089878 \$400,000
- 09/30/2020 – 05/31/2022 *Dietary Patterns and Hearing Loss in Middle-Aged and Older Americans*  
GWU 20-M131 \$30,583  
PI: Nicholas Reed
- 12/01/20 – 11/30/21 *Maximizing Inclusion of Researchers with Visual Impairments*  
R13 NEI/NIH, 13 EY031927; \$50,000  
PI: Bonnie Swenor
- 09/01/2021 -05/31/2026 *Randomized Trial of Telehealth vs. Conventional Hearing Care Delivery in the ACHIEVE Study*  
NIDCD R01DC019408-01\$3,806,031  
MPI: Lin, Frank; Sanchez, Victoria
- 09/10/2021-08/31/2022 *K-HEARS: Hearing Health Equity Through Accessible Research and Solutions for Korean Americans*  
NICDC R56DC019686 \$695,620  
PI: Carrie Nieman

## **ONGOING PHILANTHROPIC SUPPORT**

### **Cochlear Ltd.**

A transformational \$10 million gift from Cochlear Ltd. to the Johns Hopkins Bloomberg School of Public Health provides funding for core Center infrastructure and personnel, research trainees, and faculty to carry out the mission areas of the Center.

### **Eleanor Schwartz Charitable Foundation**

The Foundation provides annual support to Center faculty and trainees to carry out research and training related to hearing loss, public health, and aging.

### **Estate of Miriam Hardy**

Miriam Hardy was a world-renowned speech pathologist and audiologist at Johns Hopkins who, with her husband, William Hardy, revolutionized the process of identifying and educating children with hearing and speech disorders. A gift from her estate continues to support research trainees interested in the interface of hearing and public health.

### **William and Judith Borten American Delirium Society Junior Investigator Award**

Core faculty Esther Oh received the funding to establish the William and Judith Borten American Delirium Society Junior Investigator Award which will provide \$40,000 over 10 years (two \$2,000 awards per year).



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