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A year goes quickly when developing a Center from scratch, and in looking back over the past 12 months, it’s somewhat hard to recall all the little steps that have gotten us to where we are now. Some highlights do come to mind though –

- Central to our core mission to train a generation of researchers and clinicians, we welcomed our first cohort of Cochlear Center trainees who have been working with Center faculty over the past year. These 17 trainees consist of a range of students at different levels in their careers ranging from postdoctoral fellows to undergraduate students.

- We’ve established a formal training system to support the academic development of these trainees through the efforts of Jennifer Deal, Associate Director of Academic Training for the Cochlear Center, which consists of monthly journal clubs, seminars, weekly mentoring meetings, and structured quarterly reviews of trainee progress.

- The academic productivity of the Center faculty and trainees has been impressive with 31 publications directly related to Center mission areas over the past 12 months, including publications in JAMA and Health Affairs. Over the past year, Center faculty have also had several new additional NIH grants awarded with total NIH funding dollars for Center faculty in 2018 exceeding $6M.
• Center faculty have continued to receive significant national press coverage for their work including a featured segment on CBS Sunday Morning and articles in the New York Times and Wall Street Journal

• We’ve developed the East Asian Fellows Program in Aging, Hearing, and Public Health that will be held in July 2019. This is our first foray into projecting the work and mission of the Cochlear Center overseas. Impressively, we received 109 applications from clinicians and researchers throughout East Asia despite only advertising this inaugural program through word of mouth.

A year isn’t much time in retrospect, and I think these highlights demonstrate the potential impact that comes with the interdisciplinary work that we’re doing at the Cochlear Center linking hearing with gerontology and public health.

In discussing our work at the Cochlear Center with others over the past year, whether it’s related to our research on hearing and dementia, policy work bringing about over-the-counter hearing aid legislation, or crafting new ‘frictionless’ approaches for obtaining hearing care outside the usual clinical setting, I’m often struck by how commonly I hear a response that is along the lines of, “That makes a lot of sense”, or “No one’s done that before yet?”. From there, the person will usually then recall their own personal story of observing a family member or parent struggle with hearing and how it impacted them.

I consider this a good sign. Namely, I believe that often the most important research findings, in hindsight, seem obvious, and the most impactful innovations, in hindsight, also seem obvious. The difficulty of course is finding people who can follow through on ‘obvious’ concepts and make things a reality.

At the Cochlear Center, training such individuals who can work across disciplines and translate clinical observations into epidemiologic findings and then into interventions and actionable policy is our mission. We’re off to a good start, but over the next year with a foundation now in place for the Center, we’re looking forward to even greater progress particularly with domestic policy efforts around hearing care coverage in the U.S. and internationally with training overseas scientists and clinicians.

Frank R. Lin, MD PhD

Director, Johns Hopkins Cochlear Center for Hearing and Public Health
Professor, Departments of Otolaryngology, Medicine, Mental Health, and Epidemiology
History
The Cochlear Center for Hearing and Public Health is based in the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health and is closely affiliated and co-located with both the Johns Hopkins Center on Aging and Health and the Welch Center for Prevention, Epidemiology, and Clinical Research. The Center was launched in 2018 with more than $20 million in existing grant funding from the National Institutes of Health focused on Center-mission areas, a $10 million gift from Cochlear Ltd., and other philanthropic funding. The Center draws on the expertise of faculty members and trainees from a broad array of disciplines in order to advance the mission areas of the Center, in the U.S. and globally.

Mission
Ensuring that older adults can effectively hear and engage with the people and world around them is key to optimizing health and well-being. The Cochlear Center for Hearing and Public Health is dedicated to recruiting and training a generation of researchers, clinicians, and public health experts who can study the impact that hearing loss has on public health, develop and test strategies to address hearing loss, and help implement effective policies for hearing loss at the local, national, and global levels.

Vision
The Cochlear Center for Hearing and Public Health will work to effectively optimize the health and functioning of an aging society and become the premier global resource for ground-breaking research and training on hearing loss and public health.
Impact

The Johns Hopkins Cochlear Center for Hearing and Public Health is the only global research institution focused exclusively on issues related to hearing loss and public health in older adults. Our researchers are interested in understanding the impact of hearing loss on public health, crafting and testing solutions, and supporting and working to advance medical, public health, and governmental understanding of these issues all around the world.

The impact of the Cochlear Center for Hearing and Public Health will ultimately be measured by the accomplishments of the individuals and trainees who comprise the Center and whose research, advocacy, and academic pursuits will advance Center mission areas. These accomplishments will take place at the macro level (e.g., public policy legislation) to the micro level (e.g., programs to deliver hearing care to individuals in a particular community) and everywhere in between (e.g., acquiring grant funding for Center mission areas, influential research publications, etc.). Common to all of these accomplishments will be the foundational understanding that strategies and solutions that allow older adults with hearing loss to communicate and effectively engage with their environment are fundamental to optimize human health and aging.
Funding

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:

02/01/19 – 01/31/23

Contribution of sensorimotor function to risk and pathogenic mechanisms of Alzheimer’s disease and related dementias
NIA/NIH, R01AG061786; $3,668,824
Co-PI: Frank Lin, Jennifer Schrack, Yuri Agrawal

02/01/19 – 07/30/19

Supplemental Benefit Availability and Uptake in Medicare Advantage
The Commonwealth Fund; $45,953
Co-PI: Amber Willink and Eva DuGoff

09/01/18 – 05/31/23

Hearing loss, brain aging, and speech-in-noise performance in the ACHIEVE study
NIA/NIH, R01AG060502; $3,165,191
PI: Frank Lin

08/15/18 – 04/30/23

Accessible hearing care for reduction of disruptive behaviors and caregiver burden in dementia
NIA/NIH; K23AG059900; $991,505
PI: Carrie Nieman

08/01/18 – 07/31/20

Loan Repayment Program
NIDCD/NIH; $62,000
PI: Nicholas Reed

06/01/18 – 05/31/19

Hearing Care in Low Vision Rehab, Roybal Center (JHU), NIA/NIH; $40,000
PI: Nicholas Reed

12/01/17 – 11/30/18

Admin. Suppl. to R33DC015062 Community-Delivered Affordable, Accessible Hearing Care to Reduce Symptom Burden in Alzheimer’s Disease: Adaptation of the HEARS Intervention NIA/NIH, R33DC015062-03S1; $404,580
PI: Frank Lin

09/01/17 – 03/31/19

Medicare benefit design and long-term services and supports: Gaps, opportunities, and implications for beneficiaries
Commonwealth Fund; $295,000
PI: Amber Willink

08/15/17 – 05/31/22

Role and mechanism of hearing impairment in cognitive decline and dementia
NIA/NIH, K01AG054693; $673,807
PI: Jennifer Deal

06/01/17 – 05/31/22

Implementing a Community Health Worker Model of Providing Hearing Health Care Services to Older Adults
NIDCD/NIH, R21/R33DC015062; $2,494,615
PI: Frank Lin
Ongoing philanthropic support

• Cochlear

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.
• Frank Lin delivers keynote talks at National Yang Ming University in Taiwan and at the East Asian Society of Otology Meeting in Korea to introduce the work of the Cochlear Center and discuss available training opportunities.


• Frank Lin delivers a keynote address at the British Society of Otology in Manchester, UK to introduce the work of the Center and to further ongoing research collaborations in hearing and dementia with University College London researchers.

• The Center is featured in JHSPH Magazine
• Nick Reed visits Macquarie University in Sydney to establish collaborations for the implementation of the ENHANCE intervention at Macquarie University Hospital

**August 2018**

• The Center is featured on a CBS Sunday Morning segment in which Frank Lin and Nick Reed are interviewed by David Pogue.

• Nick Reed, Frank Lin, and Amber Willink publish a JAMA editorial emphasizing the importance for future policy to focus on hearing clinical services rather than only devices.

• Frank Lin visits the Peking University School of Public Health, Tongren Hospital, the Beijing PLA hospital, and Sichuan University to introduce the work of the Cochlear Center. The Center announces the inaugural East Asian Fellows Program for Summer 2019.

**September 2018**

• Nicholas Reed and Jennifer Deal’s research in collaboration with Optum Labs and AARP is published and featured in the New York Times and other media outlets.

**November 2018**

• Amber Willink’s research is published in Health Affairs and featured in Reuters, US News and World Report, and other outlets.

**January 2019**

• Nicholas Reed and Jennifer Deal are featured in a Wall Street Journal article on hearing and cognition.

• Carrie Nieman and HEARS featured in the Hopkins Medicine Magazine.

**February 2019**
Research Areas

Overview

Effective hearing and communication are critical for optimizing the health and functioning of older adults. However, hearing is rarely the focus of public health research and interventions. The Cochlear Center for Hearing and Public Health aims to change this paradigm not only through research to better understand how hearing problems affect health, but by identifying and implementing viable and scalable solutions. Research at the Center spans areas including the impact of hearing loss in older adults on public health; developing and testing strategies to mitigate these effects; and helping to implement policies at the local, national, and global levels to address hearing loss. This work spans myriad fields including otolaryngology, audiology, epidemiology, health economics, neuropsychology, cognitive neuroscience, and biostatistics.
Cognition and brain aging

Epidemiology of hearing loss and aging

Health economic outcomes

Enhancing patient-provider communication in health care settings

Community-based solutions to hearing care provision

Investigating over-the-counter hearing technologies
Epidemiologic research over the past several years led by Center researchers has established the contribution of hearing loss to the risk of cognitive decline and dementia in older adults. A 2017 Lancet report that identified hearing loss as the dominant risk factor for dementia was based on three landmark studies, two of which were authored by faculty at the Cochlear Center. This epidemiologic research has led to the Aging and Cognitive Health Evaluation in Elders (ACHIEVE) study which is an ongoing, large-scale randomized controlled trial. This first-in-kind trial led by Center faculty is designed to definitively determine if treating hearing loss in older adults reduces the risk of cognitive decline. This study is sponsored by the National Institute on Aging (Clinicaltrials.gov Identifier: NCT03243422). In 2018, ACHIEVE enrollment began, and as of March 2019, 618 participants had been enrolled. Study findings are anticipated in 2022.

- Concurrent research by Center researchers, including Jennifer Deal and post-doctoral fellow Nicole Armstrong, is actively focused on the mechanism underlying the relationship between hearing, cognition, and brain aging in population-based studies.
- Ongoing work includes investigating the relationship of hearing to Alzheimer’s disease biomarkers and how hearing may affect brain structure and networks, as measured through structural and functional brain magnetic resonance imaging (MRI).
Hearing loss has both direct and indirect economic implications for individuals and society. The cost of hearing aids is well documented and has been a substantial barrier for accessing the devices among older Americans. Center director Frank Lin was instrumental in the passage of the Over-the-Counter Hearing Aid Act of 2017 to make hearing aids more accessible and affordable, and these regulations will be enacted in 2020-21. At present, hearing aids can typically be purchased by consumers only when bundled together with associated professional services which may or may not always be needed. Center research, led by Amber Willink, highlighted the low use of hearing care services among older adults with hearing aids, and how the use of hearing care services in this population resulted in $2,500 lower annual spending per person for Medicare. A cost-benefit analysis of hearing care services among those with hearing aids showed substantial savings to the Medicare program.

The OptumLabs analysis, led by Nicholas Reed, showed individuals with untreated hearing loss experience higher health care costs and poor health care outcomes (hospitalizations and 30-day readmissions) compared to those who do not have hearing loss.

- In 2019, the activities of the health economics outcomes workgroup will continue to explore the health services and health

economic consequences of hearing loss, and opportunities for better care. Specifically, faculty will examine different models of coverage for hearing care services and their effectiveness in providing care at both the federal (Medicare Advantage) and state-level.

- Center researchers are also actively consulting with federal policy makers to develop draft legislation for hearing coverage under Medicare that would account for the changes expected under the OTC Hearing Aid Act while ensuring financial protection and improved access for vulnerable populations.

Epidemiologic research led by members of the Center has highlighted the substantial impact of hearing loss in society. Center researchers and trainees are continuing to investigate the prevalence of hearing loss and the impact that hearing loss has on functional domains such as loneliness and physical functioning using epidemiologic datasets. To support and enrich hearing research in the greater scientific community, the Cochlear Center implements and manages high-quality audiometric data collection in several large epidemiologic studies. Over the past year, the Center has overseen data collection in the Baltimore Longitudinal Study on Aging (n~375) and the Atherosclerosis Risk in Communities Study (n=3626). In addition, Nicholas Reed has led the protocol development and technician training in the National Health and Aging Trends Study (n=~15000), the Baltimore Epidemiologic Catchment Area Study (n=~1070), and the BIOCARD study (~222). Through these efforts, objective auditory information will be linked to health data, including neurological, cardiovascular, claims data, psychosocial, physical, and lifestyle measures.

- Ongoing work by Center researcher Adele Goman is exploring the geographic variations in hearing loss prevalence and the number of people with hearing loss, across the U.S. This work is also exploring the geographic distribution of hearing care services to identify areas that may benefit from additional hearing care options.
• Josh Betz is investigating the relationship between peripheral auditory function and central auditory processing to determine how patterns in audiometric data relate to speech understanding in noise. This research may identify whether there are other, more informative ways to summarize audiometric data aside from the speech frequency pure tone average.

• Through a dedicated hearing measurement workgroup led by Nicholas Reed, the Center is planning to expand the training and support that we offer to other investigators interested in incorporating hearing into ongoing and planned clinical and epidemiologic studies.

• Jennifer Deal continues to mentor several trainees in epidemiological analyses of hearing with cognitive, physical, and social functioning outcomes using data from ARIC.
The National Academies of Sciences, Engineering, and Medicine recognize optimal patient-provider communication as a key to improving health care outcomes. Patient-provider communication has been associated with improved patient satisfaction, treatment adherence, and other health outcomes. Despite the impact of hearing loss on communication, hearing is rarely addressed in the context of patient-provider communication. Center researcher Nicholas Reed leads initiatives to address hearing loss as a barrier to communication in health care settings via screening and intervention programs embodied in the ENHANCE intervention. These include universal screening of adults admitted to the hospital and the provision of amplification and/or use of communication strategies among hospital providers.

- Nicholas Reed is partnering with outside institutions (Macquarie University Hospital, Massachusetts General Hospital) to execute early pilot studies on the impact of the ENHANCE program.
- Nicholas Reed and Amber Willink are continuing their efforts to explore hearing loss and patient-centered health care outcomes such as satisfaction and perception of care through planned analyses in the Medicare Current Beneficiary Survey, National Health and Aging Trends Study, and Health and Retirement Study.
- ENHANCE is partnering with FutureCare in Baltimore, MD to begin feasibility studies of sustainably addressing hearing loss in a skilled nursing facility setting.

Research Areas

Enhancing patient-provider communication in health care settings
The established model of hearing health care delivery in the U.S. and much of the world is based on clinic-based audiologic and hearing needs assessment, rehabilitative counseling and education, and sensory management with the provision of amplification and other assistive devices. This model of care is associated with improvements in communication and overall domain-specific quality of life, but these services are beyond the resources of many older adults. Center researchers, led by Carrie Nieman, are committed to incorporating public health practices in order to develop new models for the delivery of hearing care and provide access to all older adults. One model is through the HEARS program which incorporates over-the-counter hearing technologies as well as key principles in designing materials and technology that are accessible to all older adults, regardless of education, literacy level or cognitive status. Much of this work is done in partnership with Mike Weikert and the Center for Social Design at the Maryland Institute College of Art.

- An ongoing NIH-funded randomized trial of the efficacy of the HEARS intervention in improving self-reported hearing handicap is ongoing in Baltimore. As of March 2019, 82 participants have been randomized with a target sample size of 120. Final results of the clinical trial will be available in 2020.

- AccessHEARS, a non-profit founded by Carrie Nieman, is continuing to provide community-based hearing care services based on the HEARS intervention throughout the Baltimore region with seed funding from AARP and other philanthropic partners.
Gold-standard hearing rehabilitative care typically comprises one-on-one sessions with an audiologist for auditory needs assessment, fitting and programming of hearing aids and related technologies, and educational counseling and rehabilitation. While this model is the gold standard, not all individuals, particularly adults with milder forms of hearing loss, may require or desire this level of care. At present, however, hearing aids in the U.S. and most countries in the world remain medically regulated devices that can only be dispensed or sold through a licensed provider. However, by 2020-21, FDA-regulated hearing aids for mild to moderate hearing loss meeting explicit performance and safety criteria will be available to the public as over-the-counter products. Nicholas Reed, Joshua Betz, and Peggy Korczak are currently focused on investigating over-the-counter technologies and how to integrate them into hearing care. Their research has focused on comparative effectiveness of technologies, the ability of consumers to adjust devices, and approaches to servicing over-the-counter technology in audiology clinics.

- Center researchers have joined a national effort in collaboration with Washington University in St. Louis and University of Pittsburgh to create a publicly accessible database of electroacoustic, real-ear measure, and speech-in-noise analyses of over-the-counter devices

- Peggy Korczak and Nicholas Reed are currently mentoring a Towson University audiology doctoral student conducting thesis research on attitudes towards over-the-counter hearing care among audiologists to better understand steps needed to integrate over-the-counter devices into future clinical practice.
At the Johns Hopkins Cochlear Center for Hearing and Public Health, we are training a generation of clinicians and researchers to study the impact that hearing loss in older adults has on public health and to develop and implement public health strategies and solutions for hearing loss. The Cochlear Center provides fellowships for pre- and postdoctoral trainees and scholarships for students enrolled in degree-bearing programs at the Bloomberg School of Public Health. The impact of the Cochlear Center for Hearing and Public Health will ultimately be measured by the accomplishments of the individuals and trainees who comprise the Center and whose research, advocacy and academic pursuits will advance Center mission areas.

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Training
Postdoctoral research fellows

The Cochlear Center provides 1-2 year fellowship opportunities for trainees with an AuD, MD, or PhD in epidemiology, biostatistics, or related fields. Trainees work with Core Faculty on existing or newly developed research projects related to the Center’s mission.

Nicole Armstrong earned her PhD in Epidemiology from the Johns Hopkins Bloomberg School of Public Health in 2017 and MPH from the Columbia University Mailman School of Public Health. As a Cochlear Center postdoctoral fellow, she studies the mechanisms underlying the association of hearing loss with cognitive decline using the Baltimore Longitudinal Study of Aging dataset. Her research interests include cognitive aging, risk factors of Alzheimer’s disease, and mechanisms underlying risk factors and Alzheimer’s disease pathology. She has co-authored 5 publications in the reporting period of which she has first-authored four, and she has five other manuscripts under review. Nicole Armstrong was the award recipient of the Nathan Shock Travel Award during the 2018 National Institute on Aging Retreat, and she won 3rd place in the postdoctoral fellow category during the Annual Research on Aging Showcase at Johns Hopkins Bloomberg School of Public Health. She attended 8 conferences in 2018, presenting a combination of 9 oral and poster presentations.
The Cochlear Center provides funding for students enrolled in degree programs at the Johns Hopkins Bloomberg School of Public Health, including Doctoral and Masters students, who are interested in conducting research related to hearing loss in older adults as part of their training.

Perry Kuo earned his MD degree from National Yang-Ming University (Taiwan) and Master of Public Health (quantitative methods) from the Harvard T.H. Chan School of Public Health, and is a third-year PhD student in the Department of Epidemiology and concurrent Master of Science student in the Department of Biostatistics.

Perry’s research interests include metrics of aging, physical activity, physical performance, and cognitive functioning. He has completed a preliminary analysis on hearing loss and physical function and physical activity in the Baltimore Longitudinal Study of Aging and is investigating the relationship between hearing loss and energy utilization. Currently, he’s working on his thesis with an expected graduation date of May 2020. In the reporting period Perry has co-authored 3 publications.
Danielle Powell earned her Bachelors of Science from Northwestern University in 2009 and a Doctorate of Audiology from the University of North Carolina in 2013. She is a second-year doctoral student in the Epidemiology of Aging Track in the Department of Epidemiology. Danielle successfully completed her written departmental comprehensive exam in July 2018 and is currently working with her advisors to finalize dissertation aims, with a final dissertation proposal anticipated by June 2019 and a department seminar to present those aims in September 2019. She serves as the Cochlear Center Journal Club Coordinator as well as various graduate student positions within the Department of Epidemiology, including serving as a Teaching Assistant for two foundational Epidemiology classes.

Danielle’s research interests include the relationship between hearing loss and cognition and depression in older adults. She is working on a systematic review regarding sensory loss and cognition, and has two analysis projects in progress related to hearing loss and diabetes as well as APOE and time to vs risk of dementia. Over the past year, Danielle gave four presentations and attended the Johns Hopkins Teaching Institute in Baltimore and the Gerontological Society of America Conference in Boston, Massachusetts.

Pablo Martinez Amezcua earned his MD from Universidad Nacional Autonoma de Mexico (UNAM) and his Master of Health Science from the Johns Hopkins Bloomberg School of Public Health. Currently he is a second-year doctoral student in the Epidemiology of Aging Track in the Department of Epidemiology. Pablo successfully completed his written departmental comprehensive exam in July 2015 and is currently working to finalize dissertation aims, with a final dissertation proposal anticipated by spring 2019 and a department seminar to present those aims in fall 2019. Pablo’s research interests include healthy aging, physical activity, sensory loss, lifespace mobility, cardiovascular disease prevention, and social determinants of health. Pablo is interested in the physical consequences of hearing loss, with a particular interest in the effect of hearing loss on physical functioning, physical activity, and life-space mobility. In the past year Pablo has first authored two publications and was a co-author on a further publication. Additionally, he presented his research at the Gerontological Society of America, November 2018 Annual Scientific Meeting in Boston, MA.
Daniel Pupo earned his Bachelor’s Degree from Texas A&M University-Corpus Christi and is a full-time Masters of Public Health student in the Johns Hopkins School of Public Health in the Aging Concentration. He is currently analyzing the relationship between hearing loss and gait using data from the Baltimore Longitudinal Study of Aging as part of his MPH Capstone project. He plans to publish the results either before or shortly after his graduation in May of 2019.

Aishwarya Shukla is a medical student at the Johns Hopkins School of Medicine and is a full-time Masters of Public Health student at the Bloomberg School of Public Health with a concentration in Epidemiology and Biostatistics. For her Capstone project, Aishwarya has completed an analysis on hearing loss and depression in the Atherosclerosis Risk in Communities (ARIC) Study and has drafted a manuscript which has been reviewed by co-authors. Aishwarya is expected to graduate with a Masters of Public Health degree in May 2019, after which she will resume her medical studies. She has published one first author publication and has another submitted. She presented her research at the American Academy of Otolaryngology-Head and Neck Surgery 2018 Annual Meeting in Atlanta, GA and at the American Association of Audiology 2019 Annual Conference in Scottsdale, AZ.

Osama Tarabichi earned his medical degree from the Royal College of Surgeons in Ireland-Bahrain and is a Masters of Public Health student in the Epidemiology/Biostatistics concentration at the Bloomberg School of Public Health. Osama is currently working on an analysis of hearing aid use and neighborhood socioeconomic status as well as an analysis of speech in noise outcomes in individuals with normal audiograms. Osama’s Capstone project will be on the impact of neighborhood socioeconomic status on hearing aid use, and he is expected to graduate in May 2019. Osama will begin his residency in otolaryngology at the University of Iowa this summer.

Michael Yong earned his MD from the University of British Columbia (UBC) in Canada and is a senior resident physician in the Otolaryngology - Head and Neck Surgery program at UBC. He is currently taking time off from his clinical training...
Jonathan Suen earned his clinical Doctorate of Audiology (AuD) degree from Gallaudet University (2016) and is currently a first-year PhD student in the School of Nursing (SON) at Johns Hopkins University. Prior to joining the SON, Jonathan completed a postdoctoral fellowship with Frank Lin where he led the community health worker pilot program for the HEARS (Hearing Equity through Accessible Research and Solutions) intervention and initiated the implementation of the HEARS randomized trial. Through his experiences investigating hearing health care disparities, he developed an interest in addressing health equity among older adults. He is presently exploring the phenomena of social isolation and loneliness through his PhD studies, and the impact of age-related sensory loss on social cohesion and psychosocial health. Jonathan has first authored two publications and has a further two first author papers in preparation. Additionally he has given seven presentations at national and international conferences, including the World Congress of Audiology meeting and the Coalition for Global Hearing Health meeting in Cape Town, South Africa.
Wakako Horiuchi is a second year medical student at the University Of Hawai‘i John A. Burns School Of Medicine in Honolulu, Hawaii. Wakako joined the Cochlear Center for Hearing and Public Health in the summer of 2018 as a visiting student with the Medical Student Training in Aging Research (MSTAR) Program sponsored by the National Institute on Aging. She completed an analysis on hearing loss and its impact on health care access and is currently drafting the manuscript. Her work was accepted as a podium presentation for the Hawaii Chapter Scientific Meeting of the American College of Physicians in Honolulu, Hawaii in February 2019. She has also submitted an abstract to the American Geriatrics Society Annual Scientific Meeting in Portland, Oregon in May 2019.

Medical students wishing to gain public health research experience may be supported by the Cochlear Center to work with faculty on short-term (2-3 month) or longer-term (up to 1 year) research projects related to the Center’s mission.

Julie Kim
Cochlear Center Faculty
Advisor: Dr. Jennifer Deal

Sun Joo (Julie) Kim earned her BS from Duke University and is a second-year medical student at the Johns Hopkins School of Medicine. Julie completed her Scholarly Concentration project in the summer of 2018 investigating the relationship between retinal signs and hearing loss in a large population-based cohort of older adults. Julie has drafted the manuscript (currently under co-author review) and is expected to graduate in May 2021. She presented this research project at the Johns Hopkins Medical Student Research Symposium in Baltimore, MD.

Wakako Horiuchi
Cochlear Center Faculty
Advisor: Dr. Nick Reed

Alan Shan
Cochlear Center Faculty
Advisor: Dr. Carrie Nieman

Alan Shan earned his B.S from Brown University and is a Johns Hopkins medical student completing a Dean’s year of research within the Cochlear Center for Hearing and Public Health.
He is working on projects on the association between hearing loss and employment, as well as the prevalence and risk factors for Eustachian tube dysfunction and plans to present findings at the national AAO-HNSF meeting in Sept 2019.

James Ting
Cochlear Center Faculty
Advisor: Dr. Jennifer Deal

James Ting earned his Bachelor of Science from Yale University and is a fourth year medical student at the Johns Hopkins School of Medicine. James is currently working on an analysis of hypertension and hearing loss and is currently finalizing data analysis, while drafting a manuscript. He is also working on an analysis of smoking history and hearing loss and is completing a systematic review on vascular risk factors for hearing loss.

Undergraduate students

Opportunities are available for undergraduate students across the Johns Hopkins University to work with Core Faculty in the Cochlear Center on short term research projects.

Jamie Shade
Cochlear Center Faculty
Advisor: Dr. Nick Reed

Jamie Shade is a fourth-year undergraduate student at Johns Hopkins University who will receive a Bachelor of Science in Biomedical Engineering in May of 2019. Jamie began work with the Cochlear Center for Hearing and Public Health in March of 2017, working under the mentorship of Nicholas Reed to develop an improved hearing screening tool. She has since continued this project, while simultaneously investigating clinical data regarding sensory impairment and mental health. She presented her research at the Association for Research in Otolaryngology MidWinter Meeting in Baltimore MD.

Pooja Nair
Cochlear Center Faculty
Advisor: Dr. Nick Reed

Pooja Nair is a senior completing her undergraduate degree in Biomedical Engineering. She has been leading a team of undergraduate engineering students to design and develop an intuitive, rapid hearing screening tool for sound-field hearing screening. She presented her research at the Department of Biomedical Engineering Design Day, Baltimore, MD and at the Association for Research in Otolaryngology MidWinter Meeting in Baltimore MD.

Yasmeen Alshabasy
Cochlear Center Faculty
Advisor: Dr. Nick Reed

Yasmeen Alshabasy is a junior at Wesleyan University. She investigated accompaniment to health care services among persons with dual sensory impairment. This project examined whether persons with sensory impairment (vision alone, hearing alone, and dual sensory impairment) had higher odds of reporting being accompanied to health care services.
The Cochlear Center hosts visiting students and faculty from other academic institutions as visiting faculty who are interested in learning about the Center’s programs, working or training with Center faculty, and developing potential collaborations. Some visiting fellows may also choose to enroll in summer institute courses at the Bloomberg School of Public Health.

**Pauline Croll**

Cochlear Center Faculty  
Advisor: Dr. Jennifer Deal

Pauline Croll earned her BSc in Psychology and MSc degree in Clinical Neuropsychology from Leiden University, the Netherlands and her MSc degree in Clinical Epidemiology from Erasmus Medical University. She is a third-year PhD student in the Departments of Epidemiology, ENT, and Radiology at the Erasmus University Medical Center. Pauline’s research focuses on the interrelations and risk factors of both hearing loss and brain changes, mainly using data from the population-based Rotterdam Aging Study. Pauline is currently working as a visiting scholar at the Cochlear Center on the association between hearing loss and white matter microstructure of the brain in the Atherosclerosis Risk in Communities study.
Training

East Asian Fellows Program

Purpose

The East Asian Fellows Program in Aging, Hearing, and Public Health will be held July 15 - 19, 2019 at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland.

The purpose of this one-week program is to provide an overview of public health concepts, methods, and strategies to assist clinicians and researchers in East Asia who are pursuing public health research and projects focused on addressing hearing loss in older adults. Lectures and small group sessions will cover epidemiology, biostatistics, clinical trials, gerontology, intervention design, health policy/economics, and select clinical topics in otolaryngology, audiology, and geriatrics.

In this inaugural year of our program, we received a 109 applications and accepted 36 program participants.
Hearing loss in the healthcare system: impact and addressing it

7/16/18

Nicholas Reed, Core Faculty, Cochlear Center for Hearing and Public Health

Social Design: From Concept to Practice

8/27/18

Carrie Nieman, Core Faculty, Cochlear Center for Hearing and Public Health

Jonathan Suen, Post-doctoral Fellow, Cochlear Center for Hearing and Public Health

Mengru Liao, Social Design Associate, Center for Social Design, Maryland Institute College of Art

An overview of current social design projects

7/16/18

Mengru Liao, Social Design Associate, Center for Social Design, Maryland Institute College of Art

Intro to Human-centered Design
Hearing Loss in the Third Age of Public Health: Where we’re headed with the Cochlear Center

9/24/18

Frank Lin, Director, Cochlear Center for Hearing and Public Health

The Hearing Needs of Medicare Beneficiaries: Past, Present and Future

10/22/18

Amber Willink, Core Faculty, Cochlear Center for Hearing and Public Health

Designing Health: How Johns Hopkins and MICA’s Center for Social Design are collaborating to bring people to the center of healthcare solutions

11/12/18

Mike Weikert, Founding Director, Center for Social Design, Maryland Institute College of Art
Becky Slogeris, Associate Director, Center for Social Design, Maryland Institute College of Art
Ashley Eberhart, Social Design Associate, Center for Social Design, Maryland Institute College of Art
Mengru Liao, Social Design Associate, Center for Social Design, Maryland Institute College of Art
Disrupt Aging. Disrupt Hearing Loss. Purpose to People to Possibilities

1/28/19
Charlotte Yeh, Chief Medical Officer, AARP Services Inc.

Early phase trials of novel hearing therapeutics: avenues and opportunities

2/11/19
Anne Schilder, Professor of Otorhinolaryngology at the UCL Ear Institute, University College London, UK

The Australian Hearing Hub — Thinking Global and Acting Local in Hearing Health

2/12/19
David McAlpine, Director of Hearing Research, Australian Hearing Hub, Macquarie University, Australia

Preventing progression in mild cognitive impairment: the Treating Auditory impairment and CogniTion (TACT) pilot trial

2/11/19
Sergi Costafreda-Gonzalez, Senior Lecturer in Old Age Psychiatry, Division of Psychiatry, University College London, UK

Brain Changes in Age-Related Hearing Loss

3/25/19
Anu Sharma, Professor, Department of Speech, Language and Hearing Sciences, University of Colorado at Boulder
Welcome to the Cochlear Center for Hearing & Public Health! Academic Program Overview & Expectations

07/09/18
Jennifer Deal, Core Faculty, Cochlear Center for Hearing and Public Health
Danielle Powell, Cochlear Center for Hearing and Public Health Trainee

Research in progress: Retinal signs and hearing loss in the Atherosclerosis Risk in Communities Neurocognitive Study (ARIC NCS)"

08/20/18
Julie Kim, Cochlear Center for Hearing and Public Health Trainee


08/20/18
Perry Kuo, Cochlear Center for Hearing and Public Health Trainee


09/10/18
Pablo Martinez, Cochlear Center for Hearing and Public Health Trainee

10/08/18
Danielle Powell, Cochlear Center for Hearing and Public Health Trainee

Research in Progress: Differential Association of Hormone Therapy with Change in Global Cognition and Incident Dementia by Hearing Status”

12/10/18
Nicole Armstrong, Cochlear Center for Hearing and Public Health Trainee


02/25/19
Jonathan Suen, Cochlear Center for Hearing and Public Health Trainee
The first annual Cochlear Center Research Day took place on March 25 and consisted of short talks by Cochlear Center faculty in the morning, followed by keynote talks from Dig Howitt, Cochlear Ltd CEO and President, and Anu Sharma, Professor of Speech, Language and Hearing Sciences at the University of Colorado at Boulder. These talks were then followed by a poster session with the Cochlear Center trainees in the afternoon.
News and Media
Select news and media appearances

**February 2019**
Nicholas Reed and Jennifer Deal featured in the Wall Street Journal.

**December 2018**
New York Times article features Frank Lin, Jennifer Deal, and Nicholas Reed
Nicholas Reed and Jennifer Deal’s research in partnership with Optum Labs and AARP is published in JAMA Otolaryngology and featured in US News and World Report and a JHSPH Press release.

Frank Lin and Nicholas Reed featured on CBS Sunday segment titled “Hearing aids: You ain’t heard nothing yet”
September 2018
Frank Lin featured in a Scientific American article titled “Hearing aids are finally entering the 21st Century”

Summer 2018
Cochlear Center featured in the JHSPH magazine
June 10, 2018

Cochlear Center Website launched

Over 15,800 page views

Over 3,600 unique users

We also have viewers from Australia, Japan, India, UK, Canada, and Philippines.
Cochlear Center
Core Faculty
Frank R. Lin, MD, PhD, is the director of the Cochlear Center for Hearing and Public Health and a professor of otolaryngology, medicine, mental health, and epidemiology at Johns Hopkins. His work at the Bloomberg School of Public Health is focused on understanding how hearing loss affects the health and functioning of older adults and implementing the local, national, and global strategies and policies needed to mitigate these effects. From 2014-2016, Lin led initiatives with the National Academies of Science, Engineering, and Medicine, the White House President’s Council of Advisors on Science and Technology (PCAST), and Congress that resulted in passage of the Over-the-Counter Hearing Aid Act of 2017 which overturned 40 years of established regulatory precedent in the U.S. He currently serves as a member of the Board on Health Sciences Policy at the National Academies.

Adele M. Goman, PhD, is a research associate in the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health. She holds a doctorate in psychology from the University of York, UK and completed postdoctoral training in epidemiology and clinical trials at Johns Hopkins University. Goman’s research focuses on the epidemiology of hearing loss with respect to the prevalence of hearing loss and the impact hearing loss is expected to have in the coming decades. Her current research is examining geographic barriers to hearing care with a focus on the geographic variation in hearing loss and the spatial accessibility of rehabilitative hearing care services.
Amber Willink, PhD, is an assistant scientist in the Department of Health Policy and Management at the Johns Hopkins Bloomberg School of Public Health. Her research focuses on the economic and health service utilization implications of gaps in health insurance benefits on older adults. At the Cochlear Center for Hearing and Public Health, Willink examines the economic impacts of hearing loss on older adults and the Medicare program as well as health services utilization outcomes associated with treated and untreated hearing loss. She is interested in the practice and policy changes that can better support older adults with hearing loss and has published research on the options for the inclusion of hearing services under the Medicare program.

Carrie L. Nieman, MD, MPH, is an assistant professor in the Department of Otolaryngology-Head and Neck Surgery at the Johns Hopkins University School of Medicine and co-founder of Access HEARS, a nonprofit committed to the delivery of affordable, accessible hearing care. As a clinician, researcher, and social entrepreneur, her commitment to social justice is inseparable from her drive to provide innovative solutions to address disparities in hearing care. Her epidemiological work documents widespread disparities in hearing health care. In order to move toward innovative, evidence-based, and sustainable solutions, Nieman works across disciplines and translates research and approaches in gerontology, social design, behavioral intervention research, community-based participatory research, and human factors to advance hearing health equity and bring innovation to underserved communities.
Jennifer A. Deal, PhD, is an epidemiologist and gerontologist with expertise in cognitive aging. She is an assistant scientist in the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health. At the Cochlear Center, Jennifer Deal is the Associate Director of Academic Training and oversees the training and didactic programs for trainees at the Center. Trained in the epidemiology of aging, Deal studies the effects of hearing loss on an aging brain and how hearing loss influences cognitive function to inform strategies for the primary prevention of cognitive decline and dementia in older adults.

Joshua Betz, MS, is biostatistician in the Johns Hopkins Biostatistics Consulting Center and is a research associate in the Department of Biostatistics at the Johns Hopkins Bloomberg School of Public Health. He obtained his MS in biostatistics from the University of Maryland Baltimore County in 2012 and joined Johns Hopkins shortly afterwards. He works on epidemiological studies, clinical trials, software for data visualization and study design, and provides statistical consulting to public health researchers. Much of his work has involved studying associations between hearing loss and health outcomes in older adults, as well as developing pilot studies for hearing loss interventions. His interests are in statistical education and practice in science, understanding and mitigating the impact of hearing loss, public health, gerontology, and clinical trials.
Nicholas S. Reed, AuD is an assistant professor of audiology in the Department of Otolaryngology-Head and Neck Surgery at the Johns Hopkins University School of Medicine and core faculty at the Cochlear Center for Hearing and Public Health. He completed his clinical doctorate at Towson University and clinical fellowship at Georgetown University Hospital. Reed has collaborated on numerous Center projects including implementing hearing data collection in large epidemiologic studies and overseeing quality care initiatives to address hearing in the inpatient setting to address patient-provider communication. His research focuses on over-the-counter amplification devices and delivery models, understanding and addressing hearing in patient-provider communication, and the relationship between hearing and healthcare utilization patterns. His research on understanding over-the-counter hearing technologies and the need for separating devices from audiologic services has been published in JAMA.
Cochlear Center
Associate Faculty

Esther Oh

Esther Oh, MD, PHD, is an associate professor in the Division of Geriatric Medicine and Gerontology, and an Associate Director of the Johns Hopkins Memory and Alzheimer’s Treatment. Oh’s research interest is in Alzheimer’s disease and related disorders including delirium. Oh actively collaborates with members of the Center on projects related to enhancing communication and improving hearing care for older adults with dementia and hearing loss.

Josef Coresh

Josef Coresh, MD, PhD, is the George W. Comstock Professor of Epidemiology, Biostatistics and Medicine at The Johns Hopkins University Bloomberg School of Public Health. Coresh serves as the co-principal investigator of the Aging and Cognitive Health Evaluation in Elders (ACHIEVE) study and works closely with Center faculty exploring data from the Atherosclerosis Risk in Communities Study (ARIC) to investigate the relationships between hearing loss and other health variables. He is a recognized leader in the epidemiology of kidney disease, big data, and biomarker research that has impacted clinical practice guidelines and policies.

Luigi Ferrucci

Luigi Ferrucci, MD, PhD, is the Scientific Director of the National Institute on Aging and conducts research on the causal pathways of age-related declines in health and functioning. Ferrucci collaborates with and mentors members of the Center exploring the relationships between hearing loss and health outcomes in the Baltimore Longitudinal Study of Aging.
Margaret Korczak, PhD, is a professor in the Department of Audiology, Speech-Language Pathology & Deaf Studies at Towson University. Korczak works closely with Center faculty on projects exploring the efficacy of technology products for individuals with hearing loss.

Marilyn Albert, PhD, is director of the Division of Cognitive Neuroscience and a professor in the Department of Neurology at Johns Hopkins. Albert’s research focuses on the early identification of Alzheimer’s disease and the cognitive and brain changes associated with aging. Albert is actively engaged in collaborations with Center faculty exploring the impact of hearing loss on cognition and brain changes in older adults.

Mike Weikert, MFA, is the founding director of the Center for Social Design at the Maryland Institute College of Art (MICA). He and his team actively collaborate with members of the Center to design programs to improve the accessibility and affordability of hearing care for older adults.

Sarah Szanton, PhD, is a professor in the Department of Community-Public Health in the Johns Hopkins School of Nursing. She collaborates with members of the Center on projects addressing disparities in hearing health care and community-delivered hearing care interventions.

Susan Resnick, PhD, is a senior investigator in the Laboratory of Behavioral Neuroscience at the National Institute on Aging. Resnick actively collaborates with Center staff and mentors Center trainees on brain imaging to explore the impact of hearing loss on the brain.

Moyses Szklo, MD, DrPH is a University Distinguished Service Professor and Professor in the Department of Epidemiology in the Johns Hopkins Bloomberg School of Public Health. He works closely with the Center on developing research and training initiatives in Latin America.
Cochlear Center Staff

Shannon Smitherman

Shannon Smitherman is the academic program coordinator for the Cochlear Center where she coordinates and helps advise Center trainees, oversees all administrative and operational aspects of Center activities, and assists the director.

Simo Du

Simo Du, MD MHS, received her medical training from Xiangya Medical School, Central South University in China. She then pursued a MHS degree in epidemiology at Johns Hopkins School of Public Health with a focus on cognitive aging. She currently serves as a biostatistician at the Cochlear Center for Hearing and Public Health and primarily assists trainees in analyzing hearing data from Atherosclerosis Risk in Communities Study (ARIC).

Jami Cheng-Trumbo

Jami Cheng-Trumbo, MSPH, is a research coordinator for the Baltimore HEARS Study. She received her master of science in public health in health education and health communication from the Johns Hopkins School of Public Health. She currently leads the coordination of the HEARS study and other Center-related activities.
Mengru Liao received her bachelor’s in applied art design from Renmin University of China and master’s in social design from Maryland Institute College of Art. She works closely with Center faculty on the development of hearing interventions and other applications requiring the use of social design and graphic design.

Emily Pedersen, MS.Ed., MPH, is a research coordinator with the Cochlear Center and a recruitment committee member in ACHIEVE. Pedersen was a teacher for Baltimore City Public Schools before earning her Master of Public Health in health policy and a certificate in health inequities from the Johns Hopkins School of Public Health. In the future, she is interested in attending medical school.

Kevin DeMario is a research program assistant who works on the HEARS clinical trial. He has his undergraduate degree and master’s degree in philosophy from Johns Hopkins and is interested in going to medical school in the future.
Lechi Nwanegwo, a graduate of Morgan State University, is a research program assistant for the Baltimore HEARS Study. Her interests include increasing health equity in underserved communities and prevention medicine. She is currently preparing to apply for medical school.

Laura Sherry, AuD, is a research audiologist with the Cochlear Center where she is currently the lead audiologist for the Washington County field site of the ACHIEVE trial.

Laura Westermann received her BA in Organizational Communication and an M.Ed in Foreign Language Education from the University of South Florida. Laura currently works on the ACHIEVE trial at the Washington County field site.
Johns Hopkins

David D. Celentano
ScD, MHS
Dr. Charles Armstrong Chair and Professor, Department of Epidemiology

Josef Coresh
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David Cade
MD, MBA
Chief Medical Officer, Cochlear Limited

Fernando Gonzalo
MSc, MBA
Head of Global Market Access and Health Economics, Cochlear Limited

Liza McKelvey
Esq.
Vice President, People & Culture and General Counsel, Cochlear Americas
Publications and Presentations in Cochlear Center mission areas


10. Goman AM, Lin FR. Hearing loss in older
adults - From epidemiological insights to national initiatives. Hear Res. 2018; 369: 29-32. PMID: 29653842.


24. Suen JJ, Bhatnagar K, Emmett SD, Marrone N, Rober SK, Swanepoel DW, Wong A,


6. Shukla A, Cudjoe T, Lin FR, Reed NS. Hearing


27. Lin FR, Invited Speaker, “Hearing loss in the third era of public health – where we’re headed with the Cochlear Center” – Maryland Commission on Aging, Laurel, MD, November 2018


30. Lin FR, Seminar speaker, “Hearing Loss, Cognition, & Dementia - From Epidemiologic Insights to Clinical Trials” – Association for Research in Otolaryngology, Baltimore, MD, February 2019

31. Nair P. Development of low-contact hearing screening tool for use in sound field,


38. Nieman CL. Session Co-Chair, Dementia Care Research: Community & Institutional Care, Dementia & Hearing Care Disparities: Prevalence of Proxy-Rated Hearing Loss & Hearing Aid Use in a Community-Dwelling Cohort of Diverse Older Adults with Dementia. Alzheimer’s Association International Conference. Chicago, IL. 7/2018


43. Nieman CL. Age-Related Hearing Loss & Innovations in Community-Delivered Care. Luzerner Kantonsspital, Department of Otolaryngology Grand Rounds. Invited Speaker. Lucerne, Switzerland. 3/2018

44. Nieman CL. Over-the-Counter Amplification: A Gerontological Perspective. Luzerner Kantonsspital, Department of Otolaryngology Grand Rounds. Invited Speaker. Lucerne, Switzerland. 3/2018

45. Nieman CL. Age-Related Hearing Loss & Innovations in Community-Delivered Care. Klinikum Bielfeld, Department of Otolaryngology Grand Rounds. Invited Speaker. Bielfeld, Germany. 4/2018

46. Powell D. Hearing Loss and Diabetes. Cochlear Center Research in Progress Talk, Center on Aging and Health, Johns Hopkins University. Baltimore, MD, May 18, 2018
47. Powell D. Innovations in Hearing Care. Broadmead Retirement Center. Invited talk. Baltimore, Maryland, October 23, 2018


49. Reed NS. Interpreting and Understanding the Relationship Between Hearing Loss and Cognitive Decline. Podium Presentation, American Academy of Audiology, Nashville, Tennessee, April 2018

50. Reed NS. Public Health Significance of Age-related Hearing Loss. Invited Feature Speaker, American Academy of Audiology, Nashville, Tennessee, April 2018

51. Reed NS. Hearing Loss and the Health Care System, Speaker, Cochlear Center for Hearing and Public Health Seminar Series at Johns Hopkins University, Baltimore, Maryland, July 2018

52. Reed NS. Over-the-Counter Hearing Care. Invited Speaker, American Speech Language Hearing Association Conference, Boston, MA November 2018.

53. Reed NS. Mamo SK. Deal A. Hearing Loss and Dementia Master Class. Invited Speaker, American Speech Language Hearing Association Conference, Boston, MA November 2018.

54. Reed NS. Hearing Loss and the Health Care System. Invited Speaker, Hearing Hub Seminar Series at Macquarie University, Sydney, Australia, August 2018

55. Reed NS. Cost Effective Hearing Care. Invited Speaker, French-Brazilian Hearing Summit, Belo Horizonte, Brazil (via satellite feed), August 2018


57. Reed NS. Over-the-Counter Hearing Care Update. Invited Panelist, American Academy of Otolaryngology Conference, Atlanta, Georgia, October 2018.


60. Reed NS. Hearing Loss and Aging: Public Health Considerations, Keynote Speaker – Adrian Davis Lecture, British Academy of Audiology, Manchester, United Kingdom, November 2018.


62. Reed NS. Hearing Loss and the Health Care System. Invited Speaker, Center for Health Services and Outcomes Research Speaker Series at Johns Hopkins University, Baltimore, Maryland, November 2018.


64. Suen JJ, Crowder S, Madison A, Peoples...


70. Suen JJ, DeMario VK, Lin FR, Reed NS, & Nieman CL. (2018 Oct). Assessing the suitability of over-the-counter amplification device user manuals for older adults. Presented at the World Congress of Audiology meeting, Cape Town (Western Cape), South Africa.


74. Willink A. Presented on estimates for adding Dental, Vision, and Hearing Benefit to Medicare and provided technical assistance for drafting legislation. Senator Cardin subsequently introduced legislation on a dental benefit for Medicare based on these discussions. Presentation to Senator Cardin’s Counsel, December 2018

75. Willink A. Presented on estimates for adding Dental, Vision, and Hearing Benefit to Medicare and provided technical assistance for drafting
76. Willink A. Presented on estimates for adding Dental, Vision, and Hearing Benefit to Medicare and provided technical assistance for drafting legislation. Presentation to House Energy and Commerce Committee Counsel, November 2018