A consortium to accelerate research into speech and language biomarkers for Alzheimer's disease

January 5 2021

Credit: Unsplash/CC0 Public Domain

Subtle changes in speech and language can be an early warning sign of Alzheimer's—sometimes appearing long before other more serious

symptoms. The challenge is recognizing these changes and determining what may signal Alzheimer's or other neurodegenerative disorders. In a commentary in *Exploration in Medicine* (November 24, 2020), Alzheimer's experts lay out a vision for a worldwide research consortium that can give clinicians—and patients—these answers in the form of digital biomarkers.

"Rapidly expanding use of smart devices, such as smart phones and digital wearables, is making it easier than ever to collect large amounts of speech and language data," says lead author Nicole Bjorklund, Ph.D., of the Alzheimer's Drug Discovery Foundation (ADDF). "What we need now is a unified approach for collecting, analyzing and sharing this information to create algorithms that can predict who will go on to develop Alzheimer's."

Dr. Bjorklund and Shobha Purushothama, Ph.D., a commentary co-author, are manager and senior director, respectively, of the ADDF's Diagnostics Accelerator. The Diagnostics Accelerator invests in research into the development of minimally invasive, low-cost and reliable biomarkers, such as measuring changes in speech and language, blood tests, and eye scans that can be used to diagnose Alzheimer's, track its progression, and improve design of clinical trials for treatments.

The commentary lays out a plan for creating a comprehensive, harmonized, open-access speech and language sample repository. To maximize its usefulness, this repository needs to include a diverse cohort of subjects representing different accents, languages, and verbal communication components. It should also include samples from people at different disease stages and include healthy controls with and without dementia risk factors for comparison. Samples also need to be collected from the same patients over time so researchers can develop biomarkers that can monitor disease progression.

"By combining the strength of experts in dementia research, linguistics, data analytics, and clinical trials, we can generate a gold standard data set," says co-author Lampros Kourtis, Ph.D., adjunct assistant professor at Tufts University and managing director of Circadic. "We can then comb through this data to find the patterns consistent with early signs of disease."

Co-author Kristina Malzbender, associate director of Health and Life Sciences at Gates Ventures, which partners with the ADDF on the Diagnostics Accelerator, says another key to the repository's usefulness depends on researchers' ability to access and analyze the data while maintaining patient privacy and data security. "We are optimistic that generating this type of high-quality data would be incredibly enabling for the field. In particular, approaches to data privacy are continually evolving and best practices should be implemented, revisited and refined when appropriate as the repository takes shape."

"Lightning-fast advances in data science, coupled with a greater understanding than ever about dementia, are opening up new and exciting avenues of research," says Howard Fillit, M.D., ADDF founding executive director and chief science officer. "The ADDF knows the value of partnerships—we employ them in our funding model and they're just as valuable in research. Alone, researchers have not been able to take full advantage of the opportunities digital technology afford, but together we can facilitate truly seismic shifts in neurodegeneration research."

More information: Nicole L. Bjorklund et al. The need for a harmonized speech dataset for Alzheimer's disease biomarker development, *Exploration of Medicine* (2020). DOI: 10.37349/emed.2020.00024

Provided by Alzheimer's Drug Discovery Foundation