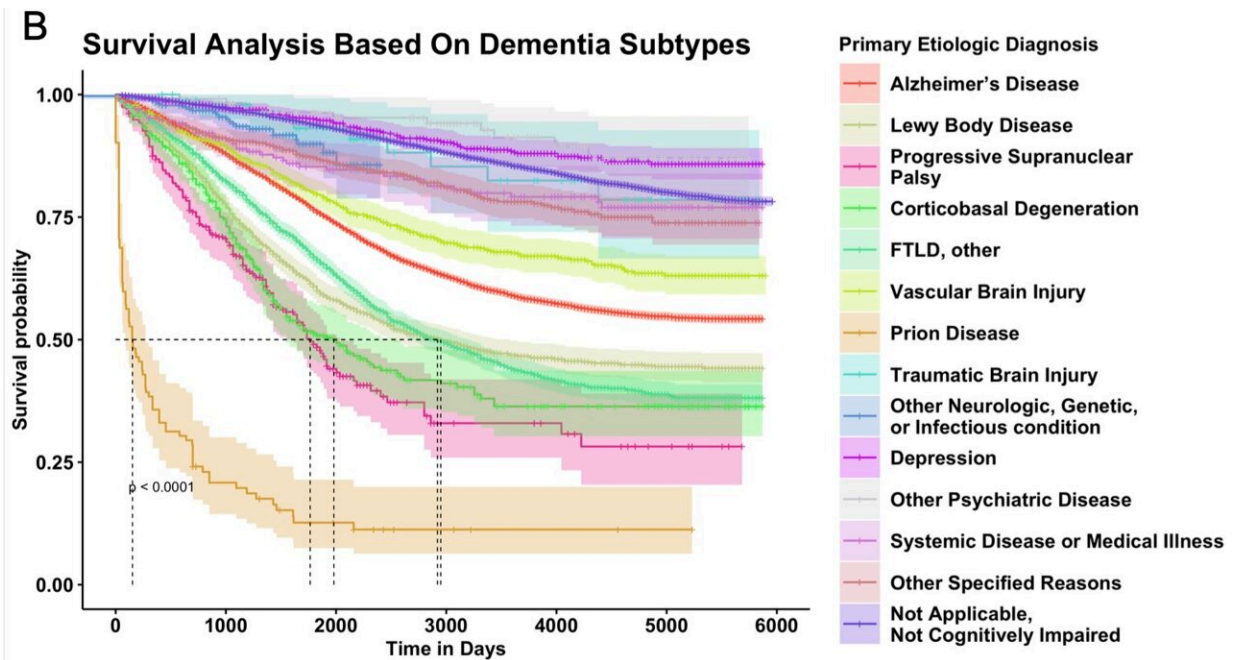


# AI finds key signs that predict patient survival across dementia types

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Survival Analysis Based On Dementia Subtypes. Credit: Zhang & Song et al., Communications Medicine

Researchers at the Icahn School of Medicine at Mount Sinai and others have harnessed the power of machine learning to identify key predictors of mortality in dementia patients.

The study, [published](#) in the February 28 online issue of *Communications*

*Medicine*, addresses critical challenges in [dementia care](#) by pinpointing patients at high risk of near-term death and uncovers the factors that drive this risk.

Unlike previous studies that focused on diagnosing dementia, this research delves into predicting patient prognosis, shedding light on [mortality](#) risks and contributing factors in various kinds of dementia.

Dementia has emerged as a major cause of death in societies with increasingly aging populations. However, predicting the exact timing of death in dementia cases is challenging due to the variable progression of cognitive decline affecting the body's normal functions, say the researchers.

"Our findings are significant as they illustrate the potential of machine learning models to anticipate mortality risk in [dementia patients](#) over varying timeframes accurately," said corresponding author Kuan-lin Huang, Ph.D., Assistant Professor of Genetics and Genomic Sciences at Icahn Mount Sinai.

"By pinpointing a concise set of clinical features, including performance on neuropsychological and other available testing, our models empower [health care providers](#) to make more informed decisions about patient care, potentially leading to more tailored and timely interventions."

Using data from the U.S. National Alzheimer's Coordinating Center that included 45,275 participants and 163,782 visit records, the study created machine learning models based on clinical and neurocognitive features. These models predicted mortality at one, three, five, and 10 years. The study developed specific models for eight types of dementia through stratified analyses.

The study also found that neuropsychological test results were a better

predictor of mortality risk in dementia patients than age-related factors such as cancer and [heart disease](#), underscoring dementia's significant role in mortality among those with neurodegenerative conditions.

"The implications of our research extend beyond [clinical practice](#), as it underscores the value of machine learning in unraveling the complexities of diseases like dementia. This study lays the groundwork for future investigations into predictive modeling in dementia care," says Dr. Huang.

"However, while machine learning holds great promise for improving dementia care, it's important to remember that these models aren't crystal balls for individual outcomes. Many factors, both personal and medical, shape a patient's journey."

Next, the research team plans to refine their models by incorporating treatment effects and [genetic data](#) and exploring advanced deep-learning techniques for even more precise predictions.

Given the [aging population](#), dementia has emerged as an increasingly pressing public health concern, ranking as the seventh leading cause of death and the fourth most burdensome disease or injury in the United States in 2016, based on years of life lost. As of 2022, Alzheimer's and other dementias cost an estimated \$1 trillion annually, impacting approximately 6.5 million Americans and 57.4 million people worldwide, with projections suggesting a tripling by 2050.

**More information:** Kuan-lin Huang et al, Machine learning models identify predictive features of patient mortality across dementia types, *Communications Medicine* (2024). [DOI: 10.1038/s43856-024-00437-7](https://doi.org/10.1038/s43856-024-00437-7). [www.nature.com/articles/s43856-024-00437-7](https://www.nature.com/articles/s43856-024-00437-7)

Provided by The Mount Sinai Hospital

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