

New study sheds light on dementia among Indigenous Bolivians

By Megan Martin, ASU News
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In two Indigenous communities living preindustrial lifestyles in the Bolivian Amazon, dementia is remarkably uncommon. However, a [newly published longitudinal study](#) reveals why earlier estimates told only part of the story.

Among the Tsimané and Mosestén communities, dementia incidence, or the rate of new cases, didn't dramatically differ from rates in U.S. and northern European populations, especially for individuals under 80 years old. Shorter survival after dementia develops appears to play a significant role in why dementia prevalence — the total proportion of people living with the disease at a given time — in the Tsimané and Mosestén populations is [unusually low](#).

“(This study) shows that not only is the number of people with dementia very low in this population, which could be explained by mortality, but also the number of people who ever develop dementia is low,” explained [Ben Trumble](#), a professor in Arizona State University's [School of Human Evolution and Social Change](#) and co-author of the study.

“This means that it is not just that people do not survive long after developing dementia; something about the Tsimané lifestyle results in lower dementia rates than we see in the U.S.”

[Margaret Gatz](#), a professor of psychology and gerontology at the University of Southern California and lead author of the study, added, “The surprising finding was that there weren't big differences in dementia incidence. That challenges us to identify the risk factors for developing dementia in the Tsimané population.”

Prevalence versus incidence

The study, published in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, followed 730 adults who did not have dementia at their initial assessment and were revisited nearly five years later. Researchers identified 22 new dementia cases, an overall incidence of 7.40 cases per 1,000 person-years. At the follow-up assessments, dementia prevalence remained below 2%.

Incidence counts new diagnoses within a given span of time, while prevalence includes everyone living with a disease, regardless of when it began. Because prevalence depends on how often a disease develops and how long people survive with it, repeated assessments revealed what a one-

time snapshot could not.

Among the Tsimané and Mositén communities, participants with dementia faced more than six times the mortality risk of those with normal cognition. Compared with U.S. studies, survival time following a dementia diagnosis appeared two to three times shorter on average.

The researchers point to the realities of life in remote communities, where families depend on members contributing to farming, hunting, fishing and food preparation. Previous research by the [Tsimané Health and Life History Project](#) (THLHP) found that the Tsimané and Mositén experienced less brain atrophy and better cardiovascular health compared to industrialized populations in the U.S. and Europe, which at the time, the authors hypothesized could be due in part to large amounts of physical activity and healthier food due to the groups' subsistence lifestyle.

"When you have to grow, gather or hunt nearly every calorie you eat, dementia can rapidly become life-threatening because it takes away the independence that daily survival requires," said Trumble, who is also a research scientist with ASU's Institute of Human Origins and core faculty with the Center for Evolution and Medicine.

Gatz noted that disabilities may reduce a person's ability to help obtain food while increasing pressure on the household. Limited medical care can also make treatable infections and other acute illnesses more deadly.

While the authors caution that 22 cases are too few to fully discern all of the factors behind low prevalence, the findings add rare incidence data to dementia research among Indigenous peoples. Some Indigenous communities report high dementia prevalence following disruptive integration into dominant societies and greater exposure to chronic disease risks. By contrast, several Indigenous and rural populations retaining subsistence lifestyles report low prevalence. The difference points to an important health-equity challenge, Gatz said.

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Additional clues from biomarkers

The dementia observed in the Bolivian communities may also differ from prototypical Alzheimer's disease. Many affected participants showed more difficulty with attention, reasoning and managing tasks than with memory, the hallmark challenge in Alzheimer's.

Preliminary blood analyses found associations between the dementia cases and the amount of neurofilament light chain proteins in blood — a general indicator of neurodegeneration — but not with amyloid or phosphorylated tau protein profiles characteristic of Alzheimer's. Imaging and vascular measures suggested contributions from blood-vessel disease.

“In most Tsimané with cognitive impairment or dementia, the pattern of atrophy in the brain is not typical of Alzheimer’s disease,” Gatz said. “Rather, there are changes indicative of vascular contributions to cognitive impairment and dementia.”

The APOE4 gene variant, the best-known genetic risk factor for Alzheimer’s, was associated with dementia in the study. However, Gatz noted that APOE4 also affects lipid transport and immune response, so the association doesn’t necessarily establish Alzheimer’s pathology.

“We need far more data before we can address the balance between lifestyle and genetic factors,” she said. “Generally, it is believed that the two have complementary roles.”

Researchers adapted clinical interviews and cognitive tests for language, culture and limited literacy, conducting assessments in Tsimané or Spanish. The THLHP teams also provide medical exams and help coordinate care. Future phases will use improved brain imaging and additional blood biomarkers to investigate vascular injury and Alzheimer’s pathology.

“The research is both immensely challenging and highly rewarding,” Gatz said. “We are grateful for their participation and try to assure that the research is helpful to them.”

These latest findings not only provide more information on how dementia affects the Tsimané and Masetén communities but also raise new questions about the factors contributing to dementia.

“Our next step is to disentangle the relative contributions of genetics, lifestyle, diet, social engagement, physical activity and immune exposures to dementia risk,” Trumble said.

“If we can identify the factors protecting people in the Bolivian Amazon and understand the biological mechanisms behind them, we may be able to turn those insights into new ways of preventing dementia here at home.”

This article was adapted from a release from the University of Southern California.

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Main image



A Tsimané woman in the Bolivian Amazon, where researchers are studying how traditional lifestyles shape brain health and aging. Photo courtesy of Sam Wann