Published January 7, 2026 by Dr. Daniel Thomas, DO, MS

What Brazilian Supercentenarians Can Teach Us About Living Longer and Healthier

Imagine living to 110 years old or beyond. These extraordinary individuals, known as supercentenarians, represent some of the rarest humans on Earth. While reaching 100 is itself exceptional, living past 110 places a person in an elite category that scientists are increasingly eager to study. A new article published in Genomic Psychiatry highlights groundbreaking research on Brazilian supercentenarians that could reshape our understanding of healthy aging.

Brazil has emerged as an unexpected hotspot for research on extreme longevity. Three of the ten longest-lived validated male supercentenarians in the world are Brazilian, including the current oldest living man, born on October 5, 1912. This is particularly striking because extreme longevity in men is far less common than in women, making these individuals especially valuable for scientific investigation.

Why Brazil Offers Unique Scientific Opportunities

Brazil's population carries what researchers describe as the world's richest genetic diversity, the result of centuries of mixing among different population groups. Beginning with Portuguese colonization in 1500, contact with Native American populations who had inhabited the territory for thousands of years initiated a complex blending of ancestries. Between the 17th and 19th centuries, approximately four million enslaved Africans were brought primarily from West Africa. Later waves of European immigrants from Italy, Germany, and Portugal arrived in the late 19th and early 20th centuries, followed by significant Japanese immigration beginning in 1908.

This complex history has produced a population with unique genomic patterns that may influence

traits such as biological resilience and longevity. Recent studies have identified more than eight million previously undescribed genomic variants in Brazilians, along with thousands of potentially significant genetic differences absent from global databases. These rare variants, overlooked in most international research, may hold keys to understanding how some people resist the diseases and deterioration typically associated with aging.

The Science of Exceptional Aging

What makes supercentenarians different at the cellular level? Research reveals that these individuals maintain remarkably youthful characteristics in their cells and immune systems, displaying a constellation of protective features that collectively resist the typical age-related deterioration. The key characteristics identified in supercentenarians include:

- **Preserved proteostasis:** Their blood cells exhibit proteasomal activity, including catalytic subunits and protein-degradation functions, comparable to those of much younger individuals. This protein-recycling system, which clears damaged or misfolded proteins that would otherwise accumulate and cause problems, typically declines significantly with age but remains robust in supercentenarians.
- **Functional autophagy:** Beyond proteasomal activity, their broader protein clearance mechanisms remain functional and upregulated, enabling efficient removal of cellular debris and damaged components.
- **Cytotoxic CD4+ T cell expansion:** Single-cell analyses have revealed a striking expansion of CD4+ T cells that adopt transcriptional programs typically associated with CD8+ cytotoxic lymphocytes. This cytotoxic CD4+ profile is virtually absent in younger controls, representing an unconventional but effective immunological strategy.
- **Adaptive immune cell reconfiguration:** Supercentenarians exhibit increased numbers of terminally differentiated effector memory T cells, including γδ and CD8+ subsets, as well as elevated natural killer cell counts. These changes enable effective responses to chronic antigenic stimulation.
- **Preserved naïve T-cell repertoire:** Variations in the IL7R gene, involved in T-cell development and homeostasis, have been implicated in maintaining functional naïve T cells in older age, a feature observed in long-lived populations with low inflammatory markers.
- **Robust antibody response:** Three Brazilian supercentenarians who survived COVID-19 without vaccination exhibited high IgG and neutralizing antibodies against SARS-CoV-2, along with plasma proteins and metabolites associated with the innate immune response and host defense.
- **Rare protective genetic variants:** Studies of an American-Spanish supercentenarian known as M116 revealed exclusive or rare variants in immune-related genes (HLA-DQB1, HLA-DRB5, IL7R), autophagy genes (ATG2A), mitochondrial electron transport genes (NDUFA9, COX7A2), chromatin remodeling genes (CHD7, ARID1A), and DNA damage response genes (ATM, BRCA1).
- **Functional independence:** Notably, some Brazilian supercentenarians remained lucid and independent in basic daily activities such as feeding themselves at the time of researcher contact, indicating preserved cognitive and physical function.

This constellation of protective features suggests that exceptional longevity may require a coordinated system of defenses working together across multiple biological pathways, positioning the immune system and genomic maintenance as converging pillars of long-term health.

Brazil’s Living Laboratory of Longevity

The research team from the University of São Paulo’s Human Genome and Stem Cell Research Center has assembled a remarkable cohort for study. They have collected clinical data and biological samples from over 100 centenarians, including 20 supercentenarians, distributed across

multiple regions of Brazil with diverse social, cultural, and environmental backgrounds.

Among their participants was Sister Inah, who was recognized as the oldest person in the world until her death on April 30, 2025, at age 116. The cohort also includes the two oldest living men in the world, both aged 112. Notably, when researchers made contact, some of these supercentenarians remained lucid and independent in basic daily activities such as feeding themselves.

The researchers have also documented exceptional familial cases that suggest longevity may run in families. One striking example involves a 109-year-old woman whose nieces are aged 100, 104, and 106 years, representing one of Brazil's longest-lived families ever documented. Previous research has shown that siblings of centenarians are 5 to 17 times more likely to reach centenarian status themselves, reinforcing the idea that genetics plays a vital role in extreme longevity.

Surviving COVID Without Vaccines

One particularly compelling finding involved three Brazilian supercentenarians who survived COVID-19 in 2020, before vaccines became available. Immunology tests showed that these individuals had robust antibody levels against the virus, along with blood proteins and metabolites associated with the innate immune response and host defense. This natural resilience to a novel pathogen at such an advanced age suggests their immune systems possess remarkable adaptive capabilities.

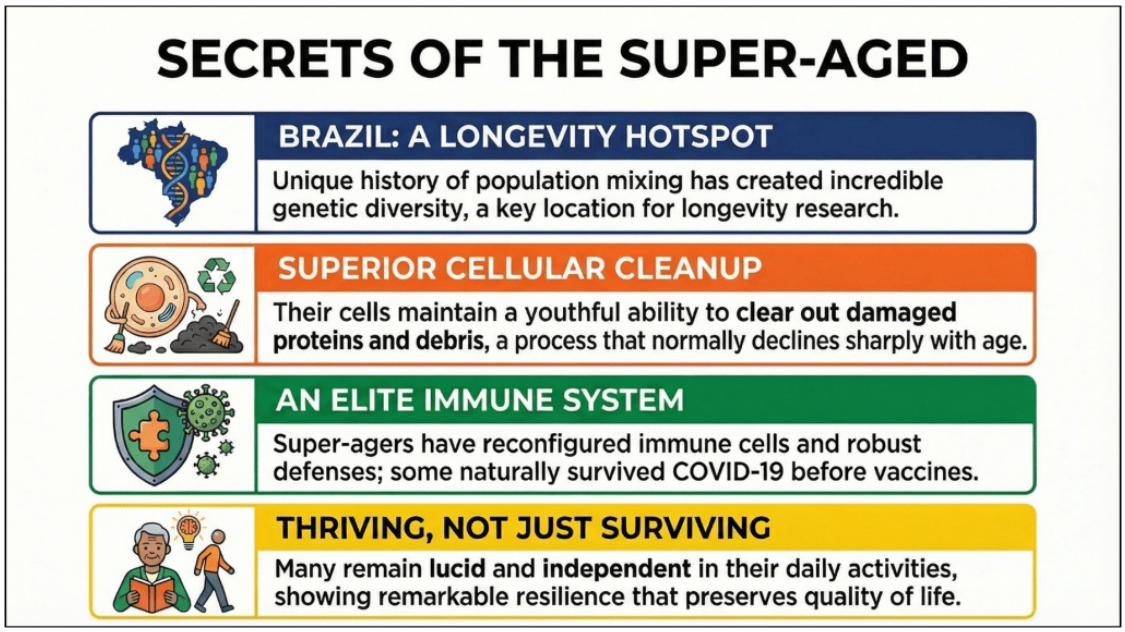
Many participants in the Brazilian study come from underserved regions with limited access to modern health care throughout their lives. This provides researchers with a rare opportunity to investigate resilience mechanisms that operate independently of medical intervention. In other words, these individuals have reached extreme old age not because of sophisticated health care, but despite its absence.

What This Means for the Rest of Us

The convergence of robust immune function, preserved protein maintenance systems, and overall physiological integrity makes supercentenarians an exceptional model for studying biological resilience. Rather than merely surviving to extreme old age, these individuals actively resist the hallmarks of aging. Understanding their protective mechanisms could unlock new therapeutic targets for age-related conditions and inspire strategies to promote healthy aging in the general population.

The researchers emphasize that supercentenarians represent far more than examples of extended biological survival. They embody principles of resistance, adaptability, and resilience that biomedical research must seek to understand if the goal is not only to extend lifespan but to enhance quality of life in aging populations.

The authors call for international longevity and genomics research consortia to expand recruitment to include ancestrally diverse and admixed populations, such as Brazil's. Such inclusion would not only deepen scientific understanding but also enhance equity in global health research. The secrets of exceptional aging, it appears, may be found in some of the most genetically diverse populations on Earth.



Citation: de Castro MV, Silva MVR, Guilherme JPLF, Zatz M. Insights from Brazilian supercentenarians. Genomic Psychiatry. 2026 Jan 6.

Previous Post
The American Paradox: High Costs, Short Lives, and the Hidden Price of Diet

Next Post
Common Food Preservatives Linked to Higher Risk of Type 2 Diabetes in Large French Study

Dr. Daniel Thomas, DO, MS

Dr. Thomas is a highly sought-after physician whose medical expertise has been forged through extensive education and refined over nearly 40 years of clinical practice. He has helped people worldwide by providing innovative solutions that not only address their immediate health concerns, but also lay lasting foundations for optimal wellness. His strength lies in his scientific curiosity, creative and analytical thinking, and practical application of cutting-edge research. Despite the demands of a busy medical practice, to stay at the forefront and continuously improve the care of his patients, Dr. Thomas devotes 20-30 hours a week to reviewing the latest scientific literature and consulting with leading scientists to identify potentially promising treatments. He shares his evidence-based insights at ThomasHealthBlog.com, where complex medical science becomes actionable health information.