Native Hawaiians face higher rates of accelerated biological aging, study finds

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We normally associate our age with the year we are born. However, what if your age could be better associated with other factors like health, diet, exercise, occupation and education level?

A new study by the University of Hawai‘i at Mānoa has discovered for the first time that Native Hawaiians experience higher accelerated

biological aging in comparison to white and Japanese American residents. The study also reports that living in adverse environments, such as in neighborhoods with low socioeconomic status, is associated with accelerated biological aging independent of ethnic background. However, life experiences may be protective against accelerated aging.

The research is published in the journal *JAMA Network Open*.

"We observed that despite living in socioeconomically poorer neighborhoods, individuals who engaged in higher physical activity, had a higher level of education attainment, and healthier diets tended to have closer to normal biological aging, which was independently associated with lower BMI and lower risk for diabetes," said lead author Alika Maunakea, a Native Hawaiian professor of epigenetics and health disparities researcher at the John A. Burns School of Medicine.

Cancer research data provides insight

To determine the findings, Maunakea and his team analyzed DNA samples from 376 participants in the UH Cancer Center's ongoing multiethnic cohort. Biological aging refers to the gradual deterioration of cellular and physiological functions over time, reflecting the body's true age at a molecular and cellular level, which may differ from chronological age. Biological aging is determined by studying a person's DNA, but not the actual DNA sequence we know as genetics.

Known as "DNA methylation," this epigenetic process controls gene activity and indicates biological age. Scientists can measure this in blood cells to determine if a person is aging faster or slower than their actual years. Faster biological aging is called age acceleration, which may correspond to health issues.

The association of life experiences with DNA methylation-derived

biological age have mostly been studied in populations of European ancestry, with only a few studies on ethnically diverse populations. Yet, ethnically diverse populations suffer from diseases of health disparities, including Native Hawaiians who have a higher risk for and an earlier age of onset of diabetes, heart disease and certain cancers compared to all other major ethnic groups in the state of Hawai‘i. Native Hawaiians also experience the highest all-cause mortality among all other ethnic groups. Maunakea hopes that this study sheds light on biological mechanisms that help to explain the origins of health disparities in Native Hawaiians in order to better address them.

"Results of this study have significant public health implications and can help shape health policy," Maunakea said. "Certain neighborhood-level factors that influence your health, such as where you live and the environment built around you therein, can be hard to change. Yet individual-level lifestyle factors like education, physical activity and diet can be improved through federal, state, and community-based programs such as MA‘O Organic Farms in Wai‘anae, a region struggling with health and socioeconomic disparities."

The results of the study are personal to Maunakea, having been born and raised in Wai‘anae.

"To me, the results are further proof that lifestyle matters to health and that as individuals we can do something about it," Maunakea said. "Being Native Hawaiian doesn't make us destined for disease, even if you live in poor neighborhoods. Our data at the molecular level shows clearly that engaging in healthier lifestyles reduces the risk for disease and likely improves longevity. This gives me hope that we can, in my lifetime, improve the overall health and well-being of our lāhui."

Maunakea said that more research is underway to determine whether different ethnic groups start off with different biological ages or whether

the differences in biological ages observed are due to social inequities. A study on the socioecological determinants of pre-diabetes led by Maunakea that has completed the recruitment of more than 2,100 adult residents, mostly of Native Hawaiians and Pacific Islander ethnic background, is attempting to validate and expand on these findings.

More information: Alika K. Maunakea et al, Socioeconomic Status, Lifestyle, and DNA Methylation Age Among Racially and Ethnically Diverse Adults, *JAMA Network Open* (2024). DOI: 10.1001/jamanetworkopen.2024.21889

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