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How do you live longer? Your genes may help

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By Michal Ruprecht



Longevity has long been thought to be shaped largely by how and where people live, but a new study suggests that our genes play a larger role. (*MJimages/E+/Getty Images*)

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Scientists have long believed that longevity is shaped by lifestyle choices; however, a new study reveals that genes may play a larger role in determining how long people live.

Genetics accounts for over half of differences in lifespan — two times **higher than** earlier estimates. Still, the finding may resonate with what people see on their family trees or what they hear during their annual physical.

“It’s not surprising at all,” said Dr. Deborah Kado, a co-director of the Stanford Longevity Center, who was not involved in the study. While scientists **agree** that most traits have a nature and nurture component, lifespan was thought to be driven largely by environment.

The finding, **published** Thursday in the journal Science, suggests that longevity is akin to other complex traits — such as **cholesterol levels** and **osteoporosis risk** — that are thought to be shaped by many genes but also heavily influenced by how and where people live.

Previous studies underestimated the influence of genetics because they relied on data from people born before the 19th century. These individuals **typically died** of infectious diseases and accidents before vaccines, medications, modern-day hygiene practices and safety regulations became widely available.

When these factors were included in older studies, they overshadowed genetic factors influencing age. Uri Alon, the lead author of the study, explains that by cleaning up the data to exclude these factors, “genes shine out to their full effect.”

“People were thinking, ‘Oh, genes are probably irrelevant,’” said Alon, who studies lifespan at the Weizmann Institute of Science in Israel. “But we have a genetic lifespan kind of predetermined in our genes.” Genes, though, don’t tell the whole story.

People still have some control over their lifespan

Although 55% of a lifespan is set, the remaining 45% is up in the air. “Some of it is luck, and some of it is our decision,” Alon explained.

According to Alon, those lifestyle choices — like exercise, diet and social connection — can shift a person’s genetically influenced age by about five years. “Genetics is not a done deal.”

Someone genetically predetermined to live 80 years could reach 85 with healthy habits, while unhealthy

lifestyle choices can shorten that expectancy to 75.

“But healthy habits won’t get you from 80 to 100 if your genetics are 80,” he said.

Life expectancy in the United States **reached** a record high of 79 years in 2024, according to data released this week by the US Centers for Disease Control and Prevention. It trended up for decades before dropping by nearly a year and a half around the Covid-19 pandemic.

That’s why Kado says products **marketed** to improve longevity are not the answer to a longer life. Instead, it comes down to exercise, diet and social connection.

The genes that determine genetic potential

Though some genes have been **identified** as protective or harmful when it comes to aging, Kado says traits like longevity are far more complicated than a few genetic factors.

“There isn’t any one gene,” Kado said. “Biology is complicated” – so complex that she says many of the elements that come together to determine age are still unknown.

But as scientists learn more about the building blocks of biological age, tools may help target pathways that shorten lifespan.

“If you know the genes, you know the mechanism,” Alon said. “And if you know the mechanism, you can intervene — you can make drugs.” This, he says, can be done instead of targeting one disease at a time.

That kind of future is still decades away, though. Genetic **screening** for **conditions** like bipolar disorder and kidney disease reveals inherited risks, but no test reliably predicts genetic age. Developing such a tool, Alon adds, would be the first step to improving the genetic lifespan.

What’s most important: health or age?

Dan Arking, who studies aging at Johns Hopkins University, says the study **illuminates** another important debate among scientists: how to weigh the benefits of years lived in good health versus total years lived.

“If you can be healthier for longer, that to me has huge value,” Arking said, arguing that living longer may not be worth it if those years are spent in poor health.

Arking says that reducing the risk of age-related diseases like osteoporosis can add more years lived in good

health. Improving the length of life, though, is tricky. And it’s **not known** whether lifespan can be extended **beyond** 122 years, the oldest recorded age.

“Once you get to a certain point, things just shut down,” Arking added. “There may be an upper limit.”

Alon also prioritizes quality of life over sheer age, noting that over the past 150 years, average life expectancy has **doubled** but the maximum lifespan has **barely budged**. In fact, mortality among centenarians **hasn’t improved** in the past 30 years.

“Once we come close to 100, we’re already feeling the wall of 120,” Alon explained. “Moving that, I think, will require much, much more drastic measures that are also very dangerous.”

Despite the ongoing debate, Alon says the study is a step in the right direction. It aims to reestablish the role of genetics in longevity — and may spark similar research in the future.

“Our study will be extra motivation to do those future genetic studies,” he said. “It’s 50% nature and 50% nurture. We’re used to that concept. And now we know that longevity is the same way.”



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