Lifespan is increasing in people who live to 65

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Stanford biologist Shripad Tuljapurkar had assumed humans were approaching the limit to their longevity – that's what previous research had suggested – but what he observed in 50 years of lifespan data was

more optimistic than he was.

Analyzing the average age of death in people who lived to be over age 65 in developed countries showed that human lifespans are increasing by approximately three years every generation and that this trend is likely to continue, at least for a while. The researchers published the results in the *Proceedings of the National Academy of Sciences*.

"The data shows that we can expect longer lives and there's no sign of a slowdown in this trend," said Tuljapurkar, professor of biology and Morrison Professor of Population Studies. "There's not a limit to life that we can see, so what we can say for sure is that it's not close enough that we can see the effect."

Living longer than our parents

Tuljapurkar and his colleagues wanted to answer two pressing questions: Is humanity approaching a limit to human lifespans? Are there factors that allow some people to live longer than others?

The researchers looked at birth and death data for people above age 65 from 1960-2010. They found that the average age of death in those who live to be older than 65 increased by three years in every 25-year period, which means that people can expect to live about six years longer than their grandparents, on average.

Furthermore, this trend continued at a relatively stable pace over the entire 50-year period and in all 20 countries that they analyzed. Factors like medical breakthroughs caused minor fluctuations in how quickly lifespans increased, but these variations averaged out over time.

The increase in lifespan during any given decade was very similar.

Getting rid of the fuzziness

Most longevity studies look at the outliers, the people who live longer than everyone else. The data get fuzzy, however, because so few people live that long. Instead, Tuljapurkar and his colleagues, including Sha Jiang, a visiting graduate student from China, looked only at people over age 65, an age range with a large number of individuals.

"Our method is novel because it allows us to get rid of the fuzziness," Tuljapurkar said. "Our focus is on the age range where we have an accurate idea of what's going on."

If we were about to hit a limit to human lifespans, the distribution of ages when people die should compress – like a rolling wave crashing into a wall – as they approach the limit. But the researchers didn't see that pattern in the data. The wave continued to move forward.

Definitely not yogurt

Tuljapurkar was surprised to see that the average age of death increased at a constant speed, but he was even more surprised that the shape of the distribution didn't change. He expected that certain endowments would allow some people to live longer than others.

"There used to be so many ads about how people could live longer by, say, eating yogurt," Tuljapurkar said. He wasn't convinced that yogurt was the key to a longer life, but he did suspect that factors like wealth could increase the likelihood that someone would live longer.

If this were true, the distribution of the data should widen as rich people live past the average age of death. But the shape of the data was consistent over the 50-year period they studied. There was no single

factor that allowed some people to live longer than others – at least not one that was showing up after age 65. Tuljapurkar noted that by the time someone has reached 65, he has already overcome many of the factors that could shorten life, like violence or early disease.

"But as someone who would like to be a one-percenter but is not, I'm certainly very happy to know that my odds of getting to live longer are just as good as the millionaire down the street," said Tuljapurkar.

More information: Wenyun Zuo et al. Advancing front of old-age human survival, *Proceedings of the National Academy of Sciences* (2018). DOI: 10.1073/pnas.1812337115

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