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# Did (x)'s Future Lifetime Just Get a Little Less Random?

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If you could find out when you were going to die, would you want to know? Groundbreaking research done within the last year aims to tell patients exactly that, with a test to determine how long you have left to live poised to hit markets in Britain.

The test measures the rate of degradation in a person's telomeres, structures found on the tips of chromosomes, and determines how fast a person is biologically aging. Based on the assumption that the length of telomeres correlates with the rate of a person's biological aging, researchers seek to offer individuals some insight into just how much longer their bodies can hold up.

Scientists believe telomeres are one of the most important and accurate indicators of the speed at which a person is aging. Every time chromosome replication occurs in your cells, the ends of your chromosomes become shorter, deteriorating and becoming more susceptible to damage (Singer 2011). Thus, rather than risk losing delicate genetic information during replication, your chromosomes become tethered with telomeres at their edges, which get shortened instead. Research has shown that those with shorter than normal telomeres have shorter than average life spans than those with longer telomeres.

The miracle test is simple; only a blood sample is required. However, it's not hard to imagine that such accessible testing can create a severe case of anxiety in patients, which is something critics see as a problem.

Insurance companies may move to mandatory telomere testing to help secure their life blocks, leading to inevitable discrimination of those with shorter telomeres. It may also stoke the public's fear of death. Customers unfamiliar with telomere biology might be lured in by the promise of false anti-aging remedies. "Miracle cures" may be offered to reduce telomere degradation and increase life expectancy.

The test would benefit responsible, health-conscious consumers who might have been disadvantaged by high premiums based on their chronological age. Not to

mention boosting the effectiveness of preventative care, as well as helping doctors to become more proactive in treating and predicting the onset of conditions like Alzheimer's, cancer, obesity and cardiovascular disease (Pollack 2011).

"Knowing whether our telomeres are a normal length or not for a given chronological age will give us an indication of our health status and of our physiological 'age' even before diseases appear," says María A. Blasco, who heads the Telomeres and Telomerase Group at the Spanish National Cancer Research Center and who co-founded the company Life Length in September 2011 (Braconnier 2011).

The test is not meant to be a diagnosis or a prognosis, according to Calvin B. Harley, Telomere research pioneer and co-founder of Telome Health, but rather a tool to help people make "personal lifestyle decisions" regarding diet, exercise and stress. The knowledge of one's probable lifespan could lead to fatalistic thinking resulting in a lack of desire to curb unhealthy habits such as smoking.

**INSURANCE COMPANIES MAY MOVE TO MANDATORY TELOMERE TESTING TO HELP SECURE THEIR LIFE BLOCKS, LEADING TO INEVITABLE DISCRIMINATION OF THOSE WITH SHORTER TELOMERES.**

The test is currently costly, at approximately \$700, though it is a cost that's likely to decrease as the test becomes more available and public demand increases. However, the best way this innovative research can be utilized is to measure the rate at which telomeres shorten, requiring several tests over a period to generate a time-frame of telomere loss. Acquiring such a detailed picture would prove to be too expensive and time consuming to both insurer and the consumer. Also accidental death would be still left unaccounted for.

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Another reason telomere testing isn't widespread is lack of uniformity across any group of people. There is an accepted average range of telomere length at certain ages, but many healthy individuals naturally have telomeres that fall outside of that range. A person could possess shorter telomeres without having a heightened propensity toward early death. As with every other health issue, telomeres do not always fall within the expected range.

While the blood test offers numerous benefits, this new technology would take several years to be implemented in the underwriting of insurance policies. The best way to take advantage of this new technology is to take multiple blood tests over a few months to observe the rate of deterioration of one's telomeres. This, however, would increase the cost of underwriting.

In conclusion, while the current research into telomeres is quite exciting, even promising, its real-world, widespread application is far from being realised. With several reliability and standardization issues to be addressed, insurance companies will remain understandably hesitant in considering its involvement in underwriting. It's business as usual with average death rates remaining the prevailing method of predicting mortality in actuarial science.



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#### A TELOMERE TIMELINE (CONNER, 2011)

**2003:** Scientists show that telomere length is a good indicator of whether a 60-year-old is likely to reach age 75 by studying 20-year-old blood samples from 143 people.

**2004:** Research indicates that some types of stress reduction, such as meditation, may lengthen telomeres. Women with chronically sick children are found to have shorter telomeres.

**2007:** A study of Scottish men reveals those with the shortest telomeres were twice as likely to develop heart disease as those with the longest. Telomere length was

shown to be as accurate as levels of cholesterol at cardiovascular disease risk prediction.

**2009:** Inherited bone marrow disease is linked with short telomeres.

**2010:** Genetically modified mice with no telomerase (an enzyme that maintains telomere length) age much more quickly than normal mice. This was shown to be reversible via injection of telomerase.

**2011:** A study in the UK shows that civil servants with more educational qualifications have longer telomeres than those with less educational qualifications. People from rich backgrounds have been shown to age slower compared to less well-off families. ☆

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