

You're only as young as you feel

■ **Laura Blows explores the difference between chronological and biological age, and how knowing members' biological ages may affect the pensions industry**

122. That's the age Jeanne Calment reached before she died in 1997, making her the oldest person to have ever lived, according to Guinness World Records.

But all may not be what it seems. Recently, a Russian study claimed that Calment died in the 1930s, with her daughter then assuming her identity to avoid paying inheritance tax. However, French officials have disputed these claims and have refused to change her death certificate.

Chronological and biological age

It seems determining age can be surprisingly tricky, even without the suggestion of alleged fraud. Not least because we can be said to have two ages – a chronological age, which simply relates to how many years we have been alive, and our biological age; how well our body is ageing.

Biological age is only relevant in context of chronological age. After all, being told your biological age is 65 is fantastic news when you're 80; less so when you're 50. Yet biological age can differ from chronological age by as much as 15 years either way, with very few people having matching chronological and biological ages.

Discussing this concept at the Longevity 15 conference was York University, Toronto, professor Moshe Milevsky, who explains that the ends of chromosomes, known as telomeres, are considered by many to be a good bio-



Summary

- People have two ages; their 'chronological age', which is based on the number of years alive, and their 'biological age', which is how well their body is ageing relative to their chronological age.
- Knowledge of members' biological ages, therefore improving accuracy of life expectancy predictions, may lower annuity pricing and result in more accurate funding reserves being required by insurers and pension funds.
- There are concerns around data privacy, accuracy of testing and the risk for fraud when testing for biological age.
- Biological ageing is just one type of information expected to be used by the pensions sector when assessing life expectancies, yet the direction of travel is heading towards utilising increasingly-personalised medical information in the future.

footballer Cristiano Ronaldo, who at 34, states he has a biological age of 23.

Pensions uses

But why should the pensions industry care about biological age, when its entire structure is based around chronological age?

The reason, according to Milevsky, is that biological age varies the greatest between people of the same chronological age at around the time of retirement, and biological age can be a better indicator of life expectancy. He gives the example of how, in 1918, during the outbreak of the Spanish flu, which was arguably the greatest longevity shock of the 20th century, a 28 year old man would have the same life expectancy as a 72 year old. Very broadly speaking, younger people were dying of the illness in greater droves than the elderly, because older people had greater resistance to the disease, having overcome previous epidemics, such as the Russian flu. Chronological age then was not a good indicator of life expectancy.

The difference in life expectancy between people of the same chronological age but with differing income levels, with the wealthy living longer, is already well known. However, according to Milevsky, income has an even greater impact on biological age. "Not only is the [richer person] going to live five years longer, they are biologically eight years younger," he states as an

example.

It is this granularity of information that would be extremely beneficial to insurance firms offering annuities. Having a more accurate reading on life expectancy would result in insurers having lower Solvency II capital holding requirements.

This, in turn, would be useful for trustees of DB schemes, who may benefit from the cheaper bulk annuity pricing offered by insurers as a result. The more accurate prediction of life expectancy may also reduce the value of sponsor payments required, Cass Business School professor of finance, David Blake, suggests.

But beyond that, the knowledge of DB members' biological ages would have very little impact, Dalriada Trustees senior trustee representative, Hugh Nolan, predicts, as any differences between biological and chronological age would likely average out in a large pool of people.

For those saving in a DC scheme, or a personal pension, it may be another matter. They may benefit from increased annuity values if they are found to have a higher biological age compared to their chronological one. Simply having a more personalised prediction of their life expectancy may assist in their long-term financial planning.

This knowledge also may benefit them beyond their finances. As biological age is not linear, it may improve or

marker of ageing. "The shorter the telomeres, the lower your life expectancy, and the less healthy you are and the older you are, the shorter the telomeres."

Other bio-markers of ageing, and lifestyle factors, can also be used to determine biological age, and measuring them is already becoming "big business", Milevsky states. This is particularly the case in the US, PwC partner Paul Kitson adds, with many different companies, such as 23andme or TeloYears, offering this service to individuals.

It may all sound very futuristic, but as Milevsky says: "Gender is fluid, why shouldn't age be fluid?" He cites examples of the Dutch man last year who went to court to try and change his official age from 69 to 49, being the age he more identifies with, along with wanting to improve his dating prospects on Tinder (the court declined his claim), and of

decline, a person may be spurred on by a high biological age to try and improve their health and/or lifestyle factors, to bring it down.

Yet this possibility of peoples' increased engagement with their biological age may not extend to increased engagement with their pension provider.

Risks

As Institute and Faculty of Actuaries' Mortality Research Steering Committee chair, Sacha Dhamani, says, someone may be willing to fill in a one-page questionnaire, but are less likely to fill in a 100-page form to provide information to determine their biological age, or even send DNA samples, particularly when it is of no personal benefit for them to do so.

Indeed, people may be offended at the 'invasion of privacy' testing for biological age requires, or reluctant to even know their biological age, in much the same way some people avoid visiting the doctor.

The question of fairness arises too, Kitson warns, with ethical concerns over whether people should be priced differently based on biological age, when some aspects of that ageing will be down to genetics (although research seems to suggest only about 25-35 per cent of genetics affect biological ageing; the rest environmental and lifestyle factors).

The insurance industry has currently gone the other way, avoiding genetics by not being able to take gender into consideration when pricing. "The industry still needs to think carefully about what information we feel is acceptable to use, and what we should not. Biological age may fall into this tricky area," Kitson warns.

Also, people may be wary of pension schemes or insurers holding such personal information, due to the risk of such data being stolen. However, Dhamani compares it to driver-tracking devices, which would have had the same initial fears.



Accuracy

But assuming these concerns were assuaged, and this information provided, how can the pensions and insurance sectors ensure that the data can be trusted?

There are currently many different ways of determining biological age, with the likelihood that different approaches would garner different results. Yet consistency would be the minimum requirement for this information to be useful.

However, Milevsky highlights that GPS tracking had the same initial issue, with many different ways of pinpointing global location, until a uniform approach was adopted.

There would also need to be complete confidence in the test/s for biological ageing, to avoid the risk of fraud. For instance the founder, Elizabeth Holmes, of blood-testing company Theranos, was charged with 'massive fraud' through false or exaggerated claims about the

accuracy of her blood-testing technology. People also may be tempted to 'game the system' and fraudulently adjust their biological age to benefit from an earlier pension age or receive higher-value payments.

For now though, the tests for determining biological age are very expensive, limiting any widespread use until cheaper tests are established.

Also, "as there is little/no historic data about the impact of biological age, it will take years to build up credible evidence of how it affects mortality rates before it could be used reliably in pricing or funding calculations – even if everyone starts recording this data now", Nolan says.

Impact

Currently, European law prevents genetic tests to be used to determine pricing of insurance products, Dhamani warns.

And, as Just Group's group medical director, Tim Crayford, says, the notion of shifting someone's actual age to their biological age is not new. "Some older calculations with medical underwriting have done this quite directly. Breckenridge, the medical underwriting textbook, describes techniques that assume when someone makes a medical underwriting disclosure, their actual age shifts backwards or forwards," he explains.

Therefore, there are questions as to what useful new information knowing biological age can really provide. For instance, Crayford notes that knowing a customer's full medical history, such as whether they have had cancer in the past few years, "offers a more accurate prediction of expected longevity than the small additional knowledge we might gain from their telomere length or other bio-marker".

Prudential Retirement head of longevity risk transfer, Amy Kessler, agrees that "since medical underwriting is similar and already in use, I do not believe this would change the services



the pensions industry provides". Instead, she expects its impact to be "about the same as medical underwriting, which has had limited take up in the market", while Nolan goes so far as to describe biological ageing as a "damp squib".

However, current models to predict life expectancy are starting to be challenged, Kitson states.

"For a long time, socio-economic group (eg wealth) estimated by postcode has been seen as a key rating factor for life expectancy – but level of educational attainment is potentially outshining wealth as a factor. So some of our previous thinking is being challenged," he explains.

Future

As there is already great awareness that life expectancy is based upon far more than simply chronological age, Blake questions whether knowledge of biological ages would affect governments' social policy, with individuals' state

pension age tailored to their biology.

Aegon pensions director, Steven Cameron, is sceptical, stating that there are many rules in the pensions arena based on chronological age, such as the minimum age for accessing pension freedoms, and the age at which the inheritance tax treatment of death while in drawdown changes. "It is unlikely that the government will replace these tests with one based on biological age."

However, Milevsky states that when the state pension age was formed in the UK in 1908, there was strong opposition to it being based upon chronological age, with outcry at the idea that all 70 year olds would receive a pension, irrelevant of whether they were healthy enough to carry on working. Chronological age did not become such a 'big deal' for people until the emergence of Hallmark Cards highlighting age as something special, he adds.

Even today, the Labour Party has hinted that it might allow individuals

in certain demanding occupations to draw their state pension from an earlier age. "You could argue this isn't too far removed from a broad reflection of how occupation can have a bearing on biological age," Cameron adds.

It may not yet be discussed in terms of 'biological age', but awareness of the differences between people of the same chronological age seems to be growing, and the direction of travel is only heading one way.

"There is more granular underwriting between pension scheme and insurer, with a greater desire to understand the differences with lives than there was 20 years ago," Dhamani states.

There already is Vitality Insurance basing pricing on the monitoring of lifestyle habits, and many individuals already have Fitbits, which showcase real-time biological information, Dhamani adds, with the amount of data it provides likely to increase in the future. It doesn't seem so implausible for pension schemes to be able to harness this easy access of data – with user permission – to establish members' biological ages.

However, "no one is going to scrap the analysis from chronological age, so biological age would only ever be used to supplement the existing data," Nolan says.

But it is clear, Kitson states, that the ability to understand an individuals' health/age/life expectancy is going to become increasingly quick, easy and cheap.

"Ten years ago, doing what TeloYears do now for \$100 would have cost circa \$100,000," he explains. "We have an explosion in wearables with (today) 2.5 million Wikipedia's worth of data being produced every month, and will soon have things like swallowables. As an industry we are going to have to operate in a profoundly different data world to the past five years, and we have much to do to think about what this means."

Written by Laura Blows