

Current issues

Longevity over the next decade



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In the past 40 years, life expectancy has increased significantly as a result of a range of factors, including advancements in cardiovascular treatments and reduction in smoking prevalence. Looking forward, what will drive future longevity trends? Considering the main forces which are likely to affect mortality can be a beneficial exercise for firms when setting mortality assumptions. In this article, we consider the positive (“tailwinds”) and negative (“headwinds”) drivers, as well as the benefits of using this driver based approach.

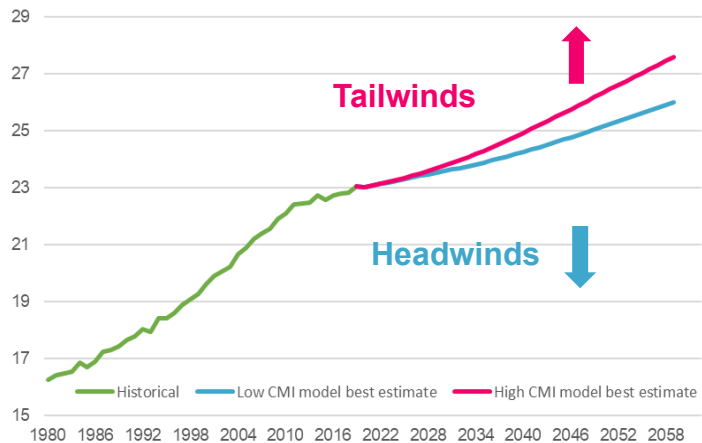
Future Trend Expectation

The CMI Mortality projection model is the tool predominantly used in the industry to express mortality trend assumptions. This data driven model, projects short term assumptions based of recent trends and long-term assumptions based on parameters set by the user. The graph below shows historical male period life expectancy from age 60 in England & Wales. The range of projections for the next 40 years reflects the best estimate assumptions used by insurers and reinsurers (using responses from our most recent benchmarking survey).

In the last 40 years, we can see this metric has increased by 6.8 years. Historically, mortality improvements have been driven by significant strides in cardiovascular surgery, statins being available and reductions in smoking prevalence. In the last 10 years, the pace of mortality improvement has slowed, which has coincided with a decrease in NHS spending increases (above inflation).

Considering the assumptions used in the insurance industry, the best estimate life expectancy growth for the next 40 years is within the range 2.9 - 4.5 years. This is notably lower than that seen in the past 40 years. This expectation is partly driven by an assumed

Historical and Projected period life expectancy (males, age 60)



continuation of the slowdown seen in the last 10 years, and that the big improvements seen in the past are generally not thought to be repeatable.

The CMI model is driven by parameters which are set by considering a user's perception of the future. Considering the real-world factors which could drive future improvements will improve the user's understanding of a CMI model-based projection. Here we consider some key examples of "headwinds" and "tailwinds", namely real-world drivers which could respectively increase and decrease future life expectancy.

Headwinds – COVID-19, dementia & Alzheimer's challenges and NHS Funding

There are many reasons why life expectancy increases might be limited when compared to that seen historically. One obvious reason for this is the ongoing excess mortality from COVID-19. Despite the severity of COVID-19 reducing in recent months, expectation is that it will continue to circulate in the community. If COVID-19 becomes another endemic disease, with similar severity to the flu, this would mean an additional 20,000 – 30,000 death each year. According to the [ONS](#), deaths year to date due to COVID-19 in England & Wales are of the order of 20,000.

Another key headwind is the limited progress seen in improvements for dementia & Alzheimer's disease, which are major causes of death in the UK. The number of people dying from these diseases is increasing. This is partly due to progress in reducing deaths from other causes, as well as changes to regulations on how deaths are recorded. However there has been very limited progress in treatment for these conditions. Currently the drugs used to treat Alzheimer's in the UK help alleviate symptoms, but do not slow down the progression of the disease. Unless effective treatments can be found that do change the course of the disease, dementia & Alzheimer's will hold up improvements in longevity over the next 10 years.

Recent clinical trial results from a new drug called [Lecanemab](#) have shown a modest slowdown in the progression of Alzheimer's. However, there is no guarantee that it will be approved for use in the UK. Last year, another Alzheimer's drug, [Aducanumab](#), was refused approval by the European regulator due to side effects which included brain swelling or bleeding in 40% of patients. Even though the new drug is performing better, 20% of patients in trials experienced similar side effects. Furthermore, the cost of the drugs is another barrier for material progress. If Lecanemab is priced the same as Aducanumab, then a year's supply would be around £25,000, which may limit the extent to which it is available through the NHS.

More generally, the NHS faces significant long-term challenges. Historically NHS funding has increased at an average 3.5% above inflation, which has supported the introduction of new treatments and meeting the needs of an ageing population. An [Institute for Fiscal Studies report](#) in 2018 projected that spending would need to increase at 3.3% above inflation until the 2030s just to maintain the level of NHS services. Subsequently there have been additional pandemic related costs, for example addressing the backlogs of procedures, which will have added to the challenges.

The rate of increases to NHS spending has been shown to be related to mortality improvements. A [University of York study](#) published last year aimed to quantify this relationship, concluding that for every 1% real increase in healthcare spending related to a 0.5% improvement in population mortality.

If future mortality improvements are to continue at the current pace, there will likely need to be increases to NHS spending which are significantly above inflation. This will be particularly challenging in the current high inflation environment, where there are significant pressures on many public sector budgets and increases to taxation are politically challenging.

Tailwinds – Technology, improved diagnostics and anti-ageing drugs

Technology has the potential to improve life expectancy by creating efficiencies in the health care sector where budgets and personnel are stretched. For example, Artificial Intelligence can be used to read diagnostic information efficiently, accurately and in some cases detect diseases earlier than if human radiologists were being used.

One key application is for cancer, which remains one of the major causes of death in the UK. Despite significant advancements in treatment, such as surgery and chemotherapy, there is still a lot of room for improvement. The deadliest form of cancer in the



UK is lung cancer with an average of 35,000 deaths per year and where the average stage of diagnosis is stage 3. There is currently no nationwide screening program in place for lung cancer.

In 2019, the “[NHS Targeted Lung Health Checks](#)” lung cancer screening pilot was launched, which uses low dose CT scanning in conjunction with AI, made available to current and ex-smokers aged between 55 and 75. Results of the pilot were very positive with 77% of patients being diagnosed with lung cancer at Stages 1 or 2. This compares with 33% of lung cancer cases being diagnosed at these stages in 2018. As a result, in October 2022 the NHS began the roll out of this program nationwide.

If the average stage of lung cancer diagnosis was reduced from stage 3 to stage 2 over the next 5 years, we estimate that this could increase period life expectancy for a 60-year-old by 1 month. In context of overall aggregate best estimate improvements anticipated over the next 5 years, this would broadly reflect 25% of the net increases expected.

In addition to improvements in diagnostics, there is a pipeline of drugs which can help treat age-related diseases such as cancer and heart disease. In addition to targeting these specific diseases, some researchers are currently looking at drugs which could slow down the rate at which we age, treating ageing as the disease. In some cases, these drugs are currently being used for other purposes. The most promising is a drug called Metformin, which has been used for many years as a treatment for diabetes.

Results of an [observational study](#) published in 2014 found that a group of diabetics taking Metformin survived 15% longer than healthy matched controls. A 15% increase to life expectancy is 3-4 years for an individual age 60 and is highly material. This is equivalent to the life expectancy growth many firms from our benchmarking survey are expecting over the next 40 years.

However, the benefits of the drug have not yet been tested within clinical trials. The “Targeting Ageing with Metformin” trial (“TAME”), is aiming to do this. The trial is currently raising funds and recruiting 3,000 people aged between 65-79 to take Metformin, with a similar number taking a placebo, over a 6-year period.

Like most drugs, TAME faces challenges in relation to funding, adoption and regulatory approval. Despite these uncertainties, Metformin is just one of many anti-ageing drugs being considered. This should therefore be an area that we monitor over the coming years as a potential material driver of increases to life expectancy.

Benefits of a Driver Based Approach

We have considered a few examples of both positive and negative future drivers of life expectancy and considered the potential impact these could have. A driver-based approach can be beneficial and compliments the use of the CMI model but is not a replacement for it. There are many potential applications for this type of approach.

Firstly, when considering best estimate assumptions, it is useful to compare a CMI projection to a breakdown of improvements by cause of death. This shows that there needs to be a strong flow of improvements for cardiovascular disease and cancer in order to sustain improvements at the levels we have seen. If we are pessimistic about the prospects in these areas, we will expect improvements to slow down.

Allowances for COVID-19 can also be derived using a driver-based approach. This would include estimating the impact of COVID-19 becoming endemic and of the additional impact of long COVID for example, along with other important factors.

Considering trend assumptions from a driver-based perspective leads to a wider range than is reflected in the industry’s CMI models, which arguably show some herding. For example, if you are sceptical about progress in Alzheimer’s and Dementia, you may feel that improvements at old ages in the core model are too high.

Finally, a driver-based approach is more common when considering stressed assumptions. A breakthrough in medicine such as an anti-aging drug would be a typical event risk scenario in the internal model.

We have significant experience in supporting clients with their assumption setting and internal model developments. We would be delighted to discuss any of the above or any other related topics with you in more detail. For more information, please get in touch.



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