



Longevity Bulletin

Issue 18: The longer lifetimes issue



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Introduction by the Editor



In recent editions of the *Longevity Bulletin*, we have focused on different factors that may affect future life expectancy. In general, mortality rates are expected to continue to decrease, driving higher life expectancies. In this issue we turn to considering the implications of these longer life expectancies. Already, in many developed countries – and in some developing ones too – population ageing is well underway, with a growing proportion of people at older ages. This poses fundamental challenges to fiscal, health and social care, and state pension systems, all of which are typically built assuming a younger and/or growing population. To take just one example, ‘pay-as-you-go’ pension systems – where those currently in work fund the pensions of those currently in retirement – become increasingly unaffordable as the number of working-age individuals per retiree falls. These challenges can seem daunting, and indeed much of the discussion around ageing societies is focused on the costs and difficulties of meeting them. It can all seem rather gloomy.

However, longer lifespans should be celebrated. They represent one of humanity’s great achievements in both improving health and defeating disease. They also create opportunities for individuals to enjoy longer and more varied careers, and for societies to invest more and achieve higher levels of productivity and innovation. Exploiting these opportunities will require a very different approach, with the need for a different mindset and some creativity.

In Lynda Gratton’s and Andrew J. Scott’s book *The 100-Year Life: Living and Working in an Age of Longevity*, the authors focus on the changes that will be required in approaches to work and education in a world of much

longer lifespans. Crucially, the traditional three-stage linear model of a single period of intense education in earlier life, followed by a sustained period in work and then retirement breaks down under these conditions. Knowledge and skills are more likely to become obsolete over these longer timeframes, for one thing. Gratton and Scott suggest that a more flexible approach is needed, with multiple periods of work interspersed with additional full-time study, breaks for parental leave and, later, possible caring responsibilities in midlife. This is quite different from what most of us have been taught to expect, but it offers the possibility of a more fulfilling life, as well as a longer one.

To achieve this more hopeful future – and capitalise on its potential benefits – we will need to ensure that health improvements at all ages are experienced more equally across the whole population. In the UK and other countries, we have been better at extending overall lifespans than at extending the proportion of life spent in good health. Assistance for those with caring responsibilities will also be important, not least in making sure that the flexibility needed to accommodate their personal obligations remains available.

In this edition of the *Longevity Bulletin*, the breadth of issues that will need to be addressed quickly becomes apparent. Tanya Singh discusses the potential benefits on offer, outlining what a more positive future could look like, whilst Nicky Draper and Mohamed Elsheemy review the recently published 10 Year Health Plan for England, which aims for a more prevention-based healthcare system. Richard Faragher and Guy Coughlan then demonstrate how medical treatments that focus on the ageing process itself could extend life expectancies considerably further (and perhaps improve health in later life as well). Philip Clark assesses the challenges for individuals of both planning and managing their retirement incomes, with an instructive case study from Australia. We also briefly consider the review of the State Pension age currently underway in the UK, and preview the work planned by the IFoA’s recently established Ageing Populations Working Party.

I hope these articles encourage more participation in investigating and understanding these important topics by actuaries, and that they offer a more hopeful outlook on what is surely one of the great challenges of our time.

A handwritten signature in blue ink, reading 'Michael Anderson'.

Michael Anderson
Editor

Foreword by the President of the IFoA



Longer life expectancies are to be celebrated, with many people being afforded more of that most precious resource: time. However, the associated demographic changes have implications for communities and policymakers, for key public services such as health and social care, and for traditional actuarial areas such as pensions.

Actuaries have been modelling mortality rates and life expectancy for hundreds of years. Indeed, it is possible to trace the beginnings of our profession back to the research that led to the creation of the first mortality tables, ultimately revolutionising the life insurance industry. Now, faced with the implications of rising life expectancies, the key question is: what can we contribute to managing these related challenges?

Unsurprisingly, I believe that actuaries have much to offer. From a technical perspective, we are skilled in thinking about and modelling complex, interconnected risks, in the face of high levels of uncertainty and over the longer term, where significant judgement is needed. Demographic projections and the determination of funding requirements for a variety of related future spending obligations are well understood in our profession. Traditionally, these have been most commonly carried out within the life insurance and pensions sectors, but the methods developed here are much more widely applicable. Crucially, actuaries are well versed

in harnessing investment returns to support future funding requirements, important especially – though not exclusively – when pension promises are pre-funded.

As important as our technical capabilities are our skills in communicating complex topics with clarity to decision makers, providing evidence and context for policy choices and financial and risk management. There are often trade-offs required when dealing with complex challenges, and ensuring that all key stakeholders understand the options, costs, and impacts on different groups is critical in making the right decisions.

Actuaries are also subject to professional oversight, with a clear code of conduct and ethical obligations, including a duty to act in the public interest. This helps give confidence in the results of our analysis and the recommendations that we make, and builds trust in the decision-making processes we support. This is vital in an area where the choices made can have profound impacts on the lives of many.

A duty to act in the public interest is as much a duty to act as it is a requirement on how to act. Actuaries can and should contribute to the many important decisions and debates that need to take place within the wider context of increasing longevity and ageing populations. We owe it to the societies within which we live to apply the many skills we have that are highly relevant to the questions and challenges that need to be addressed.

I hope that the articles in this *Longevity Bulletin* will spark interest and encourage more actuaries to become involved in this important area, and bring fresh thinking to help develop impactful solutions to the challenges that longer lifespans bring.

Paul Sweeting

President, Institute and Faculty of Actuaries

The second demographic dividend: how ageing can drive prosperity

Tanya Singh, Senior Research Fellow at the International Longevity Centre UK

Population ageing dominates economic policy debate in almost every advanced economy, and increasingly in developing ones too. By 2050, one in six people globally are projected to be aged over 65, up from one in eleven in 2019 (United Nations, 2019), whilst Maestas, Mullen and Powell (2016) estimate that a ten-percentage point increase in the over-60 population share is associated with a 5.5% decline in GDP per capita growth. Findings such as these have cemented a way of thinking about ageing that treats it overwhelmingly as a cost to be contained.

But that is only one side of what happens when populations age. The same forces that produce fiscal pressure – such as longer lives, smaller families, and slower workforce growth – also produce a sustained build-up of savings, investment, and educational spending per worker. This process is known as the ‘second demographic dividend’ (Lee and Mason, 2006; Mason, Lee and Jiang, 2016). The ‘first demographic dividend’ is the temporary growth boost that comes when the working-age share of the population increases, usually as part of a generally growing population. The second is the longer-lasting accumulation of wealth and skills supporting each worker, and – unlike the first – can in principle continue indefinitely, because it depends on the depth of what each individual worker has backing them, rather than on how many workers there are overall. Whether it does persist, however, depends on the policy choices that societies make, and these vary enormously. A full understanding of the second dividend requires an appreciation of how it works, where it comes from, and what determines whether its potential benefits are either captured or lost.

What the second dividend is, and how it works

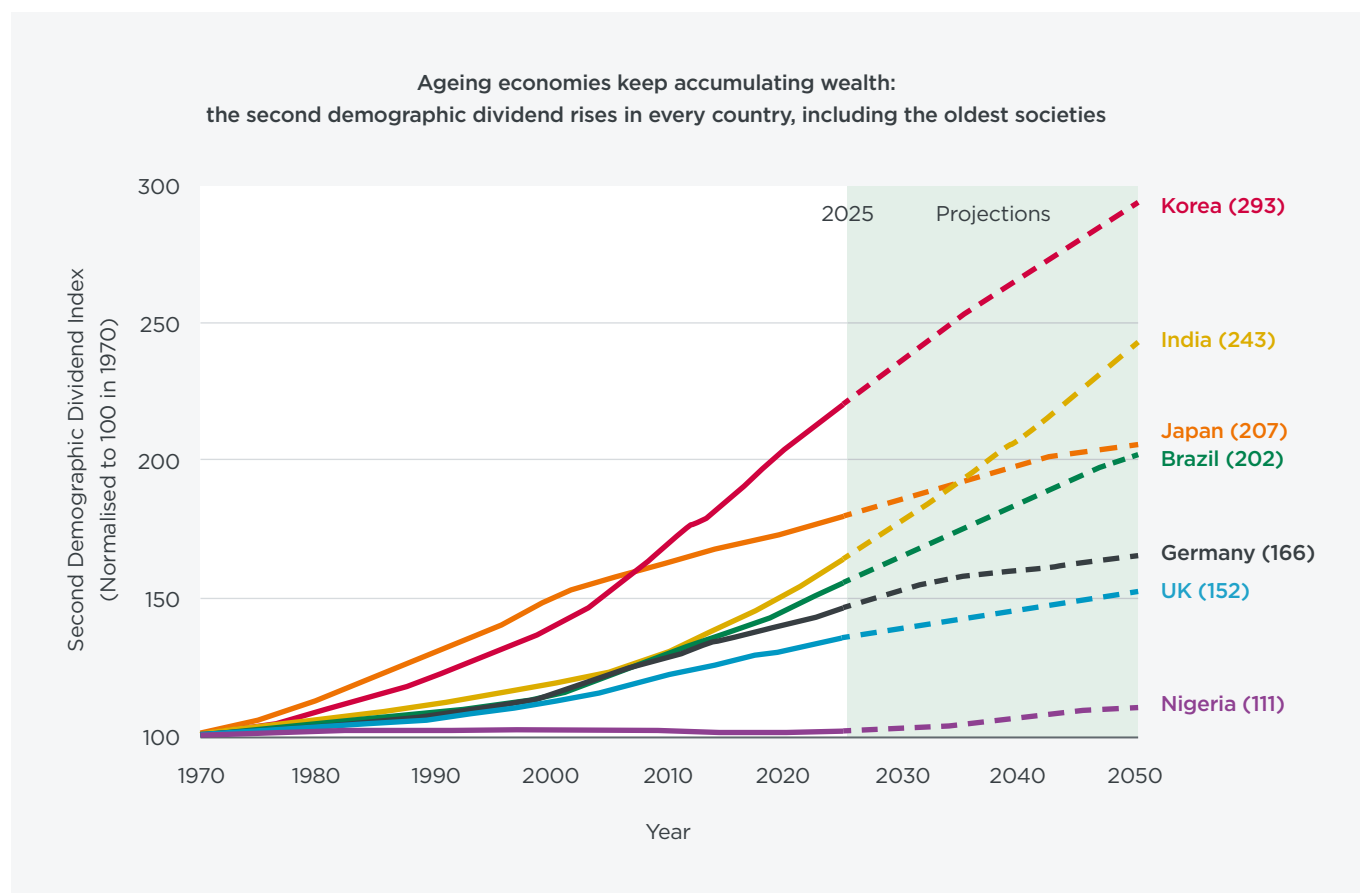
The concept of the second demographic dividend rests on a straightforward observation about the economic life cycle. In every economy, younger people tend to consume more than they produce, whereas older people tend to produce more than they consume through their prime working years. The first demographic dividend appears if the working-age

share of the population rises temporarily, boosting output per head – e.g., due to a larger specific birth cohort, such as the baby boomers in western countries reaching working age. The second dividend then describes what can follow: a longer-lasting process – driven by three connected forces – in which ageing societies accumulate more wealth and skills per worker.

When people expect to live longer and can no longer count on large families for old-age support, they tend to save more during their working years to help meet those future needs instead. Data from the National Transfer Accounts (NTA) Project show that income from savings and investments rises steeply with age as people accumulate assets (Mason, Lee and Jiang, 2016), and cross-country evidence shows that older adults frequently provide financial support to their children, rather than depending on support from them (Leahy Madsen, 2013).

A second effect operates alongside this: when the workforce grows slowly, proportionally less of each year's investment is used for equipping new entrants, whilst proportionally more goes towards improving the tools, technology, and infrastructure available to existing workers instead. Mason, Lee and Jiang (2016) show that this effect alone produces a measurable beneficial impact, even when the overall saving rate stays constant. Slower workforce growth – almost universally cited as the key economic cost of ageing – therefore turns out to be one of the routes through which each worker can in fact become more productive.

A third force works in parallel to saving and investment. When families have fewer children, they tend to spend more on each individual child's education and health. Lee and Mason (2010) find that this spending rises roughly in proportion as fertility – i.e., the number of children per family – falls. Over time, this produces a workforce that is smaller, but which tends to be better educated and more capable – the economic effect of this can be significant, provided the quality of that education is relevant to the economy's needs.

Figure 1: The second demographic dividend: International Longevity Centre analysis of NTA data.

The NTA Project, which tracks these three forces across more than a hundred economies, provides the most comprehensive evidence yet for the second demographic dividend. Its Index measures the total savings, investment, and productive assets supporting each worker, set against a 1970 baseline (as shown in *Figure 1*). When an economy's Index rises, it means that each of its current workers has more financial and physical resources supporting their productivity than the generation before them – in particular, more pension savings available to be invested, more equipment and infrastructure per person (due to more resources being available per current worker), and more spent per person on their education and health. Since 1970, the Index has risen for every sampled country's economy – in South Korea it has already more than doubled (and, on current projections, is expected to roughly triple by mid-century), whilst India, Brazil, Germany, and the United Kingdom all show sustained increases (National Transfer Accounts Project, 2024; Mason et al., 2017).

Projections suggest the Index will continue to rise into the future as populations age further, meaning that – even as workforces shrink – each remaining worker is expected to have substantially more resources supporting them than previous generations did (on a per capita basis). The pace

of this rise, however, varies enormously across countries, reflecting different pension systems, saving behaviours, and educational investments. This variation tells us that the extent to which the second demographic dividend manifests is shaped by both policy choices and social attitudes, and that countries with similar demographics can end up in very different places as a result.

The NTA's research also reveals how the drivers of the second demographic dividend are themselves projected to change over time. Between 2010 and 2040, roughly 88% of this dividend is expected to come from the build-up of savings and investment per worker, whilst between 2040 and 2070, spending on education and health per worker is projected to contribute approximately 65% (Mason, Lee and Jiang, 2016). Hence the benefit that started as a story about wealth accumulation is expected to gradually become a story about the quality of the workforce instead – in particular, what people know (education), what they can do (skills), and how long they can keep doing it (health and wellbeing). This shift matters for policy development, because the institutions needed to sustain the wealth side of achieving the dividend are very different from those needed to sustain the skills side.

The wealth side of the second demographic dividend (and the relevance of pension design)

Funded pension systems – which build up real financial assets over a working lifetime to fund income in retirement – create pools of money that can back productive investments whose returns take many years to be realised, such as infrastructure, clean energy, and business expansion (Della Croce, 2011). Conversely, 'pay-as-you-go' systems – where current contributions are used to cover current pension payments – provide retirement income but create no pool of invested savings. The Organisation for Economic Co-operation and Development (OECD) average for funded pension assets is 52% of GDP, with a range from over 100% to below 15% (OECD, 2024). Countries at the lower end of this range (and relying primarily on pay-as-you-go systems) face a compounding difficulty: each additional retiree increases the burden on current workers (since they are covering the full current cost of retirement), leaving less room for the productive investment on which realising the second dividend depends.

Moving from a pay-as-you-go system towards funded provision is politically difficult for one key reason: a specific generation of workers has to pay the cost of current retirees whilst simultaneously building a second pension pot to cover the cost of their own retirement. By contrast, when the pay-as-you-go approach was first introduced, the initial generation of retirees received pensions without contributing. The cost of that original gift would therefore be borne by the generation currently in work during any future switch away from/removal of the pay-as-you-go structure (Smith, 2000).

However, funded pension systems also carry risks that the pay-as-you-go approach avoids: when more pensioners sell assets to a smaller workforce – i.e., in an ageing population scenario – asset prices tend to fall, and this demographic pressure on asset values reduces the resources available to pay for retirement costs, compared to what was anticipated. Longer life expectancy means a given pension pot must stretch further to cover expected retirement costs over longer lifetimes (Smith, 2000). International investment can partly offset domestic demographic pressure on returns, but doing so introduces its own risks.

Even where funded pension systems do exist, how the pools of money they generate are invested matters just as much as whether they exist at all. When pension fund trustees and asset managers are judged on short-run relative performance, they rationally favour liquid, benchmark-tracking portfolios over longer-term productive assets, even when the latter better match the often decades-long liabilities they are intended to back. An economy can therefore become asset-rich in accounting terms, but productivity-poor in practice. Summers (2014)

and Eggertsson, Lancaster and Summers (2019) identified a version of this at the macroeconomic level: when savings are plentiful but productive investment is scarce, returns fall. Shifting pension supervision towards long-term reporting, and building pooled investment platforms or consolidating smaller funds into fewer, larger vehicles – approaches which can both help to give funds access to productive long-term assets at scale and reasonable cost, as seen in Australia's superannuation system (which Philip Clark discusses further **elsewhere** within this *Bulletin*) – could therefore tighten the link between retirement saving and the productive investment on which the second demographic dividend depends.

Timing also matters here. Mason and Lee (2006) show that the commitments embedded in transfer-based (i.e., pay-as-you-go) pension systems – in particular, the accumulated promises to future retirees that must be met from future workers' contributions – grow sharply over time as populations age. The longer countries rely mainly on such transfers to fund retirement, the larger those commitments become, and consequently the more costly the inevitable shift towards funded provision later, due to the unsustainable nature of pay-as-you-go provision in an ageing population. Early reform, while it is still politically and fiscally feasible, is substantially cheaper than delayed reform in the long run, and so countries that wait until the fiscal pressure becomes acute will find the costs of the transition heavier, and the window for building productive pension assets for a new funded system narrower. Earlier investment also allows more time for investment returns to accumulate, reducing the direct costs of paying future pensions by lowering the contributions required. Ensuring sufficient levels of saving for retirement, perhaps using approaches such as automatic enrolment in saving schemes and appropriate tax incentives, will therefore be critical.

The skills side of the second demographic dividend (and the need for a different kind of investment)

The quantity-quality shift in education – the process by which falling fertility leads families to invest more in each individual child's schooling and health – is already visible in the data (OECD, 2025a). Family spending per child has risen substantially in economies where birth rates have fallen, and this is translating into better-educated entry-level cohorts. The challenge, however, is that as the main driver of the second demographic dividend tilts towards skills, it depends increasingly on workers who finished their formal education perhaps decades ago.

Underlying much of the current policy response to an ageing population is an assumption that productivity follows a simple arc: i.e., that people accumulate skills early, reach peak productivity around the middle of their career, and then gradually decline as their skills potentially become

obsolete and/or they become less physically able. This assumption is systemically built into career structures, training patterns, and retirement expectations, yet also increasingly at odds with the evidence of how productivity changes. In knowledge-intensive economies, experience, tacit knowledge, and accumulated expertise play an ever-growing role in productivity, and tend to increase – rather than decrease – with age. If policy frameworks continue to treat older workers as inherently less productive, they will underestimate the economic capacity of ageing societies, and underinvest in the conditions that allow the second demographic dividend to be realised.

Education systems everywhere were typically designed around the idea that people learn when they are young, and then apply their learning for life. This worked well when careers were shorter (with life expectancies being lower) and technology evolved slowly – however, it fits poorly with modern economies that need people to remain productive and adaptable often into their seventies. OECD data shows that levels of employer-provided training drops sharply after age 50, and that employment rates among 55–64 year-olds diverge steeply by education level, with the least educated being more likely to be unemployed (OECD, 2025b). International education efforts have reinforced rather than closed this gap: the United Nations' Education for All campaign and Sustainable Development Goals gave older learners almost no attention (Seldadyo et al., 2022).

Current financing models for mid-career learning are also not conducive to unlocking the second demographic dividend. Employers often underinvest in training workers they expect to retire soon, but workers face barriers of time and cost in building new skills and knowledge if they are not supported by their employers. Returns materialise years later, and are hard to attribute to specific episodes of training. Time, more than money, is often the binding constraint for employed adults. A credible response would be to instead treat mid-career learning as shared infrastructure, supported by co-funded learning accounts, and with job portability, a legal right to paid training time, higher public funding rates for lower-paid workers, and a link to modular qualifications that stack into recognised credentials over a career. However, this would require changes not only to employment policy, but also to education policy and provision.

Skills are self-evidently only valuable when the person holding them can use them. Chronic disease erodes the productive capacity that a worker has accumulated over their career – for example, someone with worsening diabetes or persistent back pain becomes progressively less able to apply their skills and experience, by being less able to work. The World Health Organization (WHO)'s framework on healthy ageing centres on functional ability – i.e., the capacity people have to do what they value, including work – and stresses that maintaining it requires action across

health systems, long-term care, and working environments (WHO, 2015). Where chronic disease is widespread among older workers, the gains from saving and education are partially lost due to early withdrawal from the workforce (WHO, 2018; WHO, 2025).

Where caring responsibilities pull working-age people – and disproportionately women – out of employment early, pension accumulation and skill returns are weakened (Peng, 2018). Treating not just working lifetime but healthy working lifetime as an explicit policy target – with investment in both mid-life preventive and occupational healthcare, and job redesign to avoid permanent workforce exits after health setbacks – would extend the period over which both the wealth and the skills aspects of the second demographic dividend generate returns. (**Elsewhere** in this *Bulletin*, Nicky Draper and Mohamed Elsheemy discuss how the NHS in England is developing reforms in response to an ageing population that aim to achieve these outcomes.)

A further dimension to this skills challenge concerns how different generations work together. Demographic transitions reshape the balance between younger and older workers in terms of relative numbers, and the economic consequences depend on whether the system pits them against each other, or allows them to effectively complement each other. When older workers' accumulated experience and expertise supports younger workers' development, innovation, and adaptability, the productivity of both groups is enhanced, and the second demographic dividend can be achieved. When instead generations compete for limited opportunities – or when older workers are 'pushed out' to make room for younger ones – the accumulated knowledge upon which the second demographic dividend depends is lost. Policies that encourage mixed-age teams, cross-generational mentorship structures, and phased transitions – rather than abrupt retirement at an arbitrary age – are likely to produce more resilient economic outcomes than those that treat the labour market as a zero-sum contest between different age groups.

Rethinking ageing

The second demographic dividend is a conditional proposition: if retirement is increasingly pre-funded and well-governed, if skills accumulation continues through working life rather than stopping at around age 25, and if healthy ageing is pursued as functional ability rather than a clinical outcome, then wealth per worker can keep rising even as the workforce shrinks.

For those economies already advanced on the ageing trajectory, the next two decades will be decisive: pension assets accumulated now will shape the investment base for the rest of the century, and the education and health systems built now will determine whether the second demographic dividend is realised or forfeited.

Population ageing changes the basis upon which economies grow, and shifts output from the quantity of workers to the quality of what each worker has supporting them: savings that are productively invested, skills that evolve over a full career – rather than just at the beginning – and working lives long enough for both to generate returns. Whether this shift sustains prosperity is shaped not by demography alone, but by policy choices – countries that design their pension, education, health, and employment systems around this understanding have the chance to sustain prosperity with an older population by harnessing the second demographic dividend. However, those countries that continue to treat ageing only as a cost will find, in time, that this cost is all they have.

References

- Della Croce, R. (2011). Pension funds investment in infrastructure: policy actions. *OECD Working Papers on Finance, Insurance and Private Pensions*, 13. <https://doi.org/10.1787/5kg272f9bnmx-en>
- Eggertsson, G., Lancastre, M. and Summers, L.H. (2019). Aging, output per capita and secular stagnation. *American Economic Review: Insights*, 1(3): 325–42. <https://doi.org/10.1257/aeri.20180383>
- Leahy Madsen, E. (2013). For fast-growing countries, should aging be a concern? Planning for the second demographic dividend. *New Security Beat*, 10 Sep. <https://www.newsecuritybeat.org/2013/09/fast-growing-countries-aging-concern-planning-demographic-dividend/> [Accessed 9 June 2026.]
- Lee, R. and Mason, A. (2006). Back to basics: what is the demographic dividend? *Finance & Development*, 43(3). <https://doi.org/10.5089/9781451922486.022>
- Lee, R. and Mason, A. (2010). Fertility, human capital, and economic growth over the demographic transition. *European Journal of Population*, 26(2): 159–82. <https://doi.org/10.1007/s10680-009-9186-x>
- Maestas, N., Mullen, K.J. and Powell, D. (2016). *The effect of population aging on economic growth, the labor force and productivity*. RAND Working Paper 1063-1. https://www.rand.org/pubs/working_papers/WR1063-1.html [Accessed 9 June 2026.]
- Mason, A., Lee, R., Abrigo, M. and Lee, S.-H. (2017). *Support ratios and demographic dividends: estimates for the world*. UN Population Division Technical Paper 2017/1. <https://www.un.org/development/desa/pd/content/support-ratios-and-demographic-dividends-estimates-world> [Accessed 9 June 2026.]
- Mason, A., Lee, R. and Jiang, J.X. (2016). Demographic dividends, human capital, and saving. *Journal of the Economics of Ageing*, 7: 106–22. <https://doi.org/10.1016/j.jeoa.2016.02.004>
- Mason, A. and Lee, R. (2006). Reform and support systems for the elderly in developing countries: capturing the second demographic dividend. *Genus*, 62(2): 11–35. https://www.researchgate.net/publication/228629115_Reform_and_Support_Systems_for_the_Elderly_in_Developing_Countries_Capturing_the_Second_Demographic_Dividend [Accessed 9 June 2026.]
- National Transfer Accounts Project (2024). *Time series indicators: 2024 revision*. <https://ntaccounts.org/web/nta/show/Indicators> [Accessed 9 June 2026.]
- Organisation for Economic Co-operation and Development (OECD) (2024). *Pension markets in focus 2024*. <https://doi.org/10.1787/b11473d3-en>
- OECD (2025a). *Education at a glance 2025: OECD indicators*. <https://doi.org/10.1787/1c0d9c79-en>
- OECD (2025b). *OECD Employment outlook 2025: can we get through the demographic crunch?* <https://doi.org/10.1787/194a947b-en>
- Peng, I. (2018). Culture, institution and diverse approaches to care and care work in East Asia. *Current Sociology*, 66(4): 643–59. <https://doi.org/10.1177/0011392118765211>
- Seldadyo, H., Ali, S., Turana, Y., et al. (2022). *Population ageing and the second demographic dividend: new policy challenges in the new era*, T20 Indonesia Policy Brief. <https://www.global-solutions-initiative.org/publication/population-ageing-and-the-second-demographic-dividend-new-policy-challenges-in-the-new-era/> [Accessed 6 June 2026.]
- Smith, S. (2000). *Should the UK switch from a pay-as-you-go to a funded pension scheme?* Institute for Fiscal Studies (IFS) Briefing Note. https://ifs.org.uk/sites/default/files/output_url_files/fp184.pdf [Accessed 6 June 2026.]
- Summers, L.H. (2014). U.S. economic prospects: secular stagnation, hysteresis, and the zero lower bound. *Business Economics*, 49(2): 65–73. <https://doi.org/10.1057/be.2014.13>
- United Nations (2019). *World population prospects 2019*. <https://www.un.org/development/desa/pd/news/world-population-prospects-2019-0> [Accessed 6 June 2026.]
- World Health Organization (WHO) (2015). *World report on ageing and health*. <https://www.who.int/publications/item/9789241565042> [Accessed 6 June 2026.]

WHO (2018). *Integrated care for older people (ICOPE)*. <https://www.who.int/teams/maternal-newborn-child-adolescent-health-and-ageing/ageing-and-health/integrated-care-for-older-people-icope> [Accessed 6 June 2026.]

WHO (2025). *Integrated care for older people (ICOPE): guidance for person-centred assessment and pathways in primary care*, 2nd ed. <https://www.who.int/publications/item/9789240103726> [Accessed 6 June 2026.]

Tanya Singh



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Longevity and the NHS: a system under pressure

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Longevity as the NHS’s defining test

While the NHS *Fit for the Future: 10 Year Health Plan for England* is not explicitly framed as a longevity strategy, many of its proposed reforms can be understood as responses to population ageing and its consequences (UK Government, 2025). The UK is entering an era where extended lifespans will exert increasing pressures on healthcare systems, as the prevalence of multimorbidity – or multiple interacting conditions – increases with age.

The NHS reform agenda recognises the rise of multimorbidity across the population as a central challenge. Managing patients with multiple interacting conditions requires more coordinated, continuous care, and has become a key driver of efforts to integrate services across primary, community, and hospital settings (Imison, 2023; UK Government, 2025).

Life expectancy has risen significantly over recent decades, but gains in healthy life expectancy – i.e., the age until which a person can expect to live in good health, and also known as ‘healthspan’ – have been far more limited.

Table 1: Life expectancy at birth in the UK.
(Data source: ONS, 2026.)

	Healthy life expectancy (years)	Life expectancy (years)	Expected proportion of life spent in good health
Females	60.9	83.0	73%
Males	60.7	79.1	77%

As per *Table 1*, the latest data shows that around 25% of life in the UK is now spent in poor health, more for women than men. The gap between lifespan and healthspan has widened in recent years, with recently measured (self-reported) healthy life expectancy falling to its lowest level since records began in 2011 to 2013 (ONS, 2026).

Crucially, these averages mask stark inequalities – for example, the difference in healthy life expectancy between the most and least deprived areas in England is now close to two decades, highlighting that the benefits of longer lives are not being experienced equally across the population (Stiebahl and Balogun, 2025). This shows that the pace of ageing is not a universal constant, but rather one shaped by geography, deprivation, and access to both health and social care.

For the NHS, this creates a fundamental shift in demand, as healthcare systems historically designed around acute – i.e., short-term – illnesses must now increasingly manage multiple, long-term, complex conditions, often over many years. This shift is reflected in a growing emphasis on digital care, and services delivered closer to home (UK Government, 2025).

Viewed through this lens, the 10 Year Health Plan is not simply a programme of reform, but a diagnosis of how healthcare systems must evolve in response to longer, and increasingly unequal, lives.

In this article, we explore how population ageing is reshaping the NHS. We begin by examining how ageing is changing patterns of healthcare demand and placing pressure on hospital-centred models, before considering the system’s response through digital innovation, and a shift toward more community-based care.

Changing patterns of healthcare demand

Population ageing is reshaping how healthcare services are used in fundamental ways. As life expectancy increases, a growing proportion of the population is living with the older age-related issues of chronic disease, frailty, and cognitive decline, and often with these in combination. This shift is not simply about more people needing care, but about a transformation in the type of care required.

Multimorbidity is now a defining feature of later-life health. The proportion of older adults living with multiple long-term conditions is projected to rise sharply over the coming decades, with the proportion comprising the most complex

cases increasing fastest, which is likely a reflection of the increasing proportion of older people in the population, combined with the higher prevalence of multimorbidity at older ages. Modelling suggests particularly rapid growth in the proportion of those living with four or more chronic conditions, reflecting both longer survival, and the accumulation of disease over time (Kingston et al., 2018).

This analysis was part of a larger study, the MODEM Project – a comprehensive approach to MODElling outcome and cost impacts of interventions for DEMentia (Comas-Herrera et al., 2017). This involved the development of a dynamic microsimulation model – the Population Ageing and Care Simulation (PACSim) Model – which simulates the characteristics (i.e., sociodemographic factors, health behaviours, chronic diseases, and geriatric conditions) of individuals over the period 2014–2040.

This trend is illustrated in *Figure 1*, which shows the projected growth in multimorbidity, particularly among those with the most complex health needs. Healthcare demand in aggregate is therefore increasingly characterised by complex, overlapping conditions from the growing number of elderly patients, rather than by single disease pathways.

This has important implications for how care is delivered. Patients with multimorbidity typically require closer ongoing management, input from multiple specialties, and coordination across services. Care pathways therefore become longer and less predictable, and the risk of hospital admission (and readmission) increases. As a result, NHS healthcare utilisation is increasingly driven by continuous,

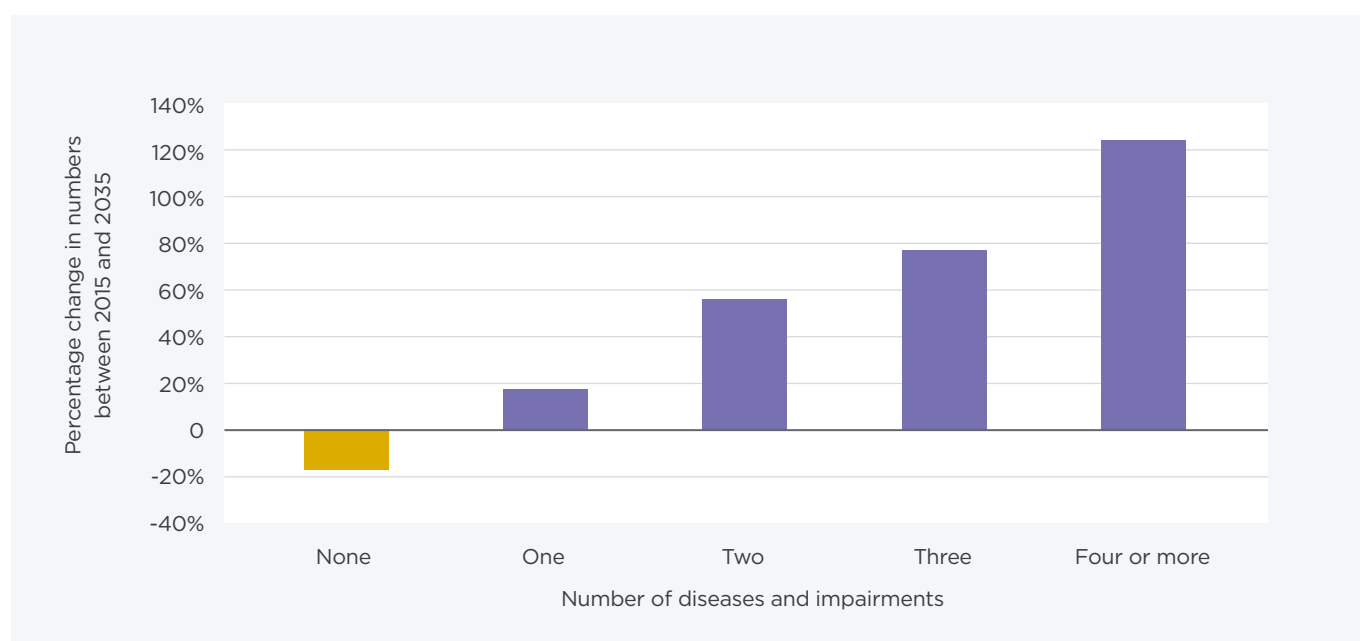
complex multimorbidity management needs spread across multiple services, rather than by discrete episodes of treatment for acute conditions (Imison, 2023).

Pressure on hospital-centred systems

The rise in multimorbidity places particular strain on healthcare systems organised around hospitals as the primary site of care, such as the NHS. Hospitals are highly effective at delivering acute, episodic – i.e., one-off, focused – interventions, but are less well suited to managing patients with multiple, interacting conditions that require ongoing oversight. However, all of this sits within a system that remains under pressure, particularly given the backlog of diagnostic interventions that are still on the NHS elective waiting list.

Older patients with complex health needs are more likely to experience longer hospital stays, delays in discharge, and higher rates of hospital readmission. These patterns reflect not only the greater clinical complexity of their conditions, but also the difficulty of coordinating their care across different parts of the system. These patients may require input from multiple specialties alongside social care and community support, because multimorbidity, frailty, cognitive impairment, and functional decline often create needs that extend beyond acute medical treatment in hospital. Discharge may therefore depend on the availability of community nursing, rehabilitation, home care packages, or residential care. As a result, hospitals increasingly function as holding points within a wider system that is often fragmented and subject to constrained capacity (Imison, 2023).

Figure 1: Projected percentage change in the number of chronic conditions in older adults (those aged 65 years and over) in England between 2015 and 2035. The fastest growth is observed among those with four or more conditions, highlighting increasing clinical complexity. (Data source: Kingston et al., 2018.)



This dynamic contributes to well-documented pressures across the NHS, including bed shortages, congestion in emergency departments, and ongoing strain on the workforce. Delayed discharges in particular illustrate how bottlenecks outside hospitals, especially in social care, can reverberate back into hospital settings, reducing the flow of patients through the system, and thus limiting the availability of beds for new admissions (Farnsworth et al., 2022).

Recognising these pressures, NHS policy has become increasingly focused on reducing reliance on hospital-based care – a shift not simply about cost control, but redesigning care to better align with the needs of the growing number of older patients.

Digital care and care closer to home

A central component of the NHS response to rising demand is the expansion of digital health technologies, alongside the shift of care away from hospital settings. These developments are intended to support earlier intervention, improve efficiency, and enable patients – particularly older adults – to be more effectively treated and managed in their own homes (UK Government, 2025).

A key example is the growth of remote monitoring and virtual wards. These models allow patients to receive acute-level care in their usual place of residence, supported by clinical teams using digital tools to track vital signs and detect deterioration. NHS England has positioned virtual wards as a core component of future service delivery, enabling patients who would otherwise require hospital admission to be treated safely at home (NHS England, 2024b). For ageing populations, this offers the potential to reduce hospital appointments and stays, minimise disruption for the patient, and support longer periods of independent living.

Digital triage and consultation systems are also playing an increasingly important role in managing healthcare demand. Online platforms can help direct patients to appropriate services more quickly, thereby reducing unnecessary hospital visits and improving access to care. In principle, these tools allow the system to respond more dynamically to fluctuating demand, while also freeing up clinical capacity for more complex cases.

However, the impact of digital care depends not only on the technological capability of healthcare providers, staff, and patients, but also on how effectively it is integrated into wider care pathways. Patients with multimorbidity often require coordinated input across primary care, specialist services, and social care. Without this integration, digital tools risk adding new layers of complication to an already complex, fragmented system, rather than simplifying it. There are also practical constraints to these tools, including variation in digital infrastructure across regions, and the capacity of the healthcare workforce to adopt new technologies at scale (Gerhold, 2022).

Taken together, digital and closer-to-home health services represent a significant opportunity to reshape how care is delivered in an ageing society. Their effectiveness, however, will depend on whether they can support genuinely integrated, patient-centred care.

Community-based support

Alongside digital innovation, the NHS reform agenda also places increasing emphasis on care delivered within local communities. This reflects a growing recognition that the drivers of health in later life extend beyond clinical care, and that – as we have seen – managing ageing populations requires a broader, more integrated approach to care (UK Government, 2025).

Community-based care models aim to support individuals earlier and more holistically, particularly those with complex or long-term needs. Initiatives such as social prescribing, local wellbeing programmes, and partnerships with voluntary organisations such as Age UK – which works in close partnership with the NHS to provide social prescribing services – are designed to address factors such as loneliness, physical inactivity, and poor housing, all of which are closely linked to poor health outcomes in older age. NHS England has increasingly promoted ‘neighbourhood health’ approaches, which seek to bring together primary care, community services, social care, and the voluntary sector at a local level to try and address some of these challenges (DHSC, 2026).

Social prescribing generally refers to health and care professionals connecting people to a range of non-clinical support – such as arts, sport and exercise, nature groups, and employment or housing support – and usually through a social prescribing link worker.

This shift in approach reflects an important evolution in how health is understood. For individuals with multimorbidity, health outcomes are often shaped as much by social and environmental conditions as by medical treatment. Interventions that improve mobility, social connection, or housing stability can therefore play a critical role in maintaining their independence and reducing their demand for acute – and usually hospital-based – services. In this sense, community-based care is not simply an add-on to the healthcare system, but rather a core component of how health is managed and sustained over longer lives.

However, the effectiveness of these approaches depends heavily on the strength and capacity of local infrastructure. Community services are often unevenly developed, with significant variation in funding, workforce numbers and expertise, and availability across regions. The interface between healthcare and social care remains fragmented,

with responsibility for delivery distributed across multiple organisations with differing priorities and resource constraints (Mercer et al., 2021). As a result, while the direction and intention of policy is clear, its implementation is likely to be highly variable.

For ageing populations, this variability matters. Community-based support has the potential to reduce hospital admissions and support people to live independently for longer, but only if it is delivered consistently and at sufficient scale. Otherwise, the shift away from hospital-centred care may remain incomplete, and potentially compound pressure on acute services (Holmås et al., 2013).

Inequality, access, and the risk of two longevity futures

The 10 Year Health Plan arrives at a time when inequalities in both digital access and later-life health are already both large and widening (DHSC, 2025; ONS, 2026), and future health outcomes depend largely on how these inequalities are addressed. We now explore how the reforms may either translate into longer, healthier lives for most people, or into two different longevity paths, split by income, geography, and digital literacy.

The digital divide

Digital access is widely recognised as a practical precondition both to benefit from many current and future NHS innovations, and for access to primary care – e.g., as booking systems and other resources move online – yet a substantial minority of adults lack the skills, devices, or connectivity to participate (NHS England, 2024a). Statistics show that 6% of UK households do not have internet access at home (Ofcom, 2025), and those aged 75 and above are the most likely to not have internet access at home (or have access, but not use it).

However, digital exclusion is not just related to age. Indeed, a quarter of those without internet access at home are under 55 years old (Lloyds Banking Group, 2025), and around 37% of those without online access report barriers linked to health impairments, such as poor vision or dexterity, which limit their ability to use digital services.

Other factors include geography (particularly rural areas with poor connectivity), language and literacy, low confidence, and lack of trust in online systems. However, whilst patterns of digital exclusion are changing, with the proportion of people without internet access having halved compared to pre-pandemic levels, an estimated 10 million people in England still lack basic digital skills (Diwakar and Owolabi, 2025).

Figure 2: Comparing healthy life expectancy at birth in the least and most deprived areas in England. (Data source: ONS, 2026.)

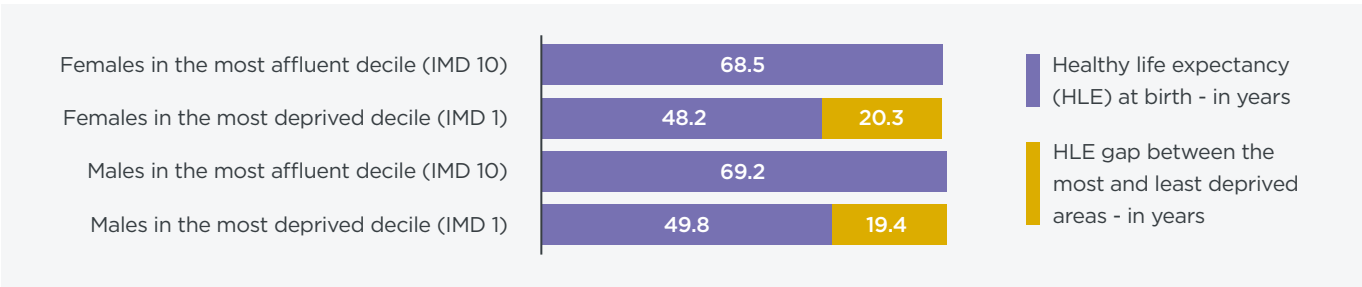


Figure 3: Gap in healthy life expectancy at birth between the least and most deprived deciles in England over the last 10 years. (Data source: ONS, 2026.)

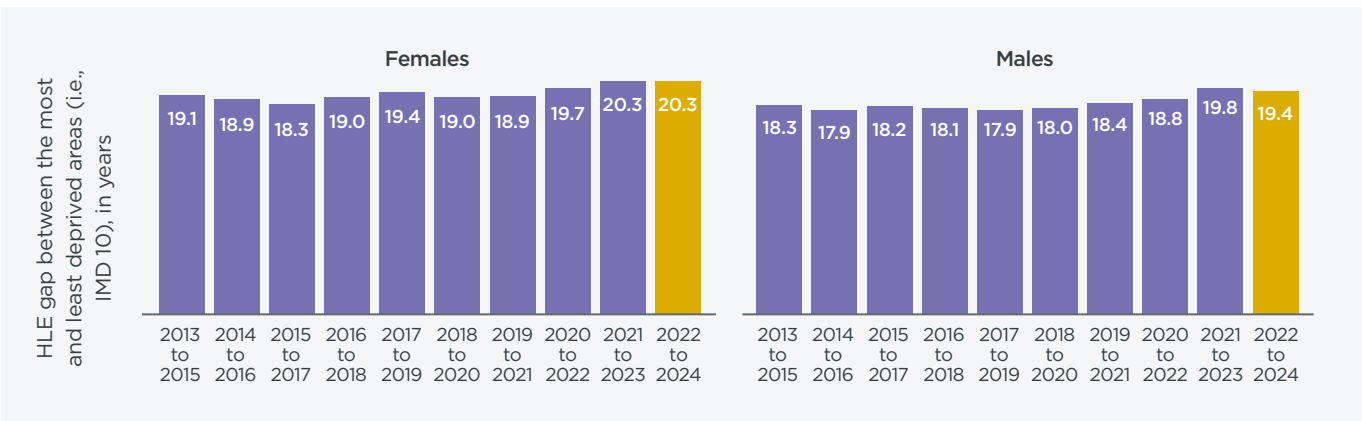
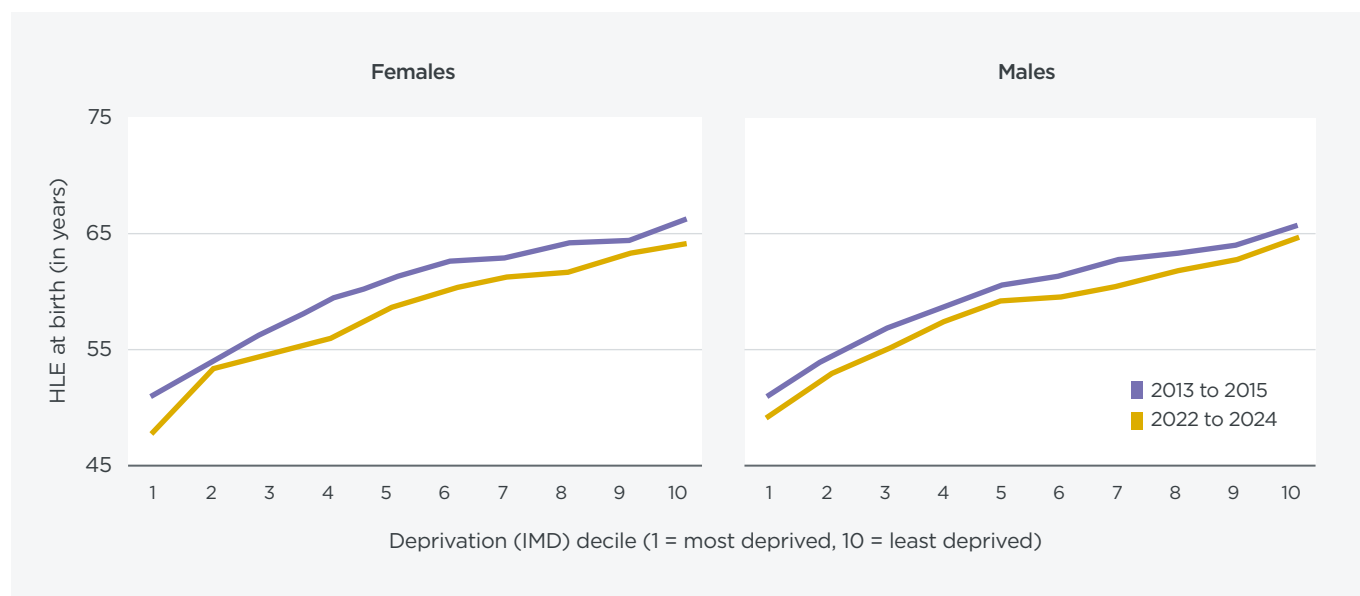


Figure 4: Healthy life expectancy at birth declined in all deprivation deciles in England over the last 10 years.

(Data source: ONS, 2026.)



Health inequalities in later life

As illustrated in *Figures 3 and 4*, healthy life expectancy has in fact declined in locations from all Index of Multiple Deprivation (IMD) deciles in recent years, and inequalities between regions also continue to widen. In practice, this means that many people in less affluent locations are already living in serious ill health well before reaching pension age, while by comparison their peers in more affluent areas can expect to experience up to two decades of additional healthy years.

These trends in healthspan inequality are reinforced by lower uptake of prevention programmes in more deprived communities, such as screening and immunisation, and also reflect the heightened concentration of cancer, respiratory, cardiovascular, metabolic, neurological, and mental health risk factors in those communities. A 2025 report from the Department of Health and Social Care highlights marked geographic variation in both health risk factors and outcomes, with worse trends in many deindustrialised towns and coastal areas than in the national averages (DHSC, 2025). For longevity, this 'postcode penalty' is already ingrained into current cohorts; the question for the UK Government is whether the 10 Year Health Plan flattens or steepens that gradient.

Why this matters for society

The combination of a 'digital first' NHS and deep-rooted health inequalities creates a real possibility that NHS reforms may improve average healthcare access and efficiency, while at the same time widening the gap between the health outcomes of the most and least affluent. Individuals in more affluent areas – with better access to broadband internet, devices, and digital skills – are well-placed to benefit from digital healthcare tools, proactive prevention, and new community-based services, and so realise potential gains in healthy life expectancy. By contrast, those in more deprived areas – with poorer baseline health and weaker digital access – may find such services harder to reach and the related benefits slower to materialise, even as overall healthcare performance appears to improve.

This raises uncomfortable questions about fairness in a health system originally founded on a principle of equal access for equal need. A poorly managed shift to 'digital by default' without strong offline guarantees could lock millions of older people out of essential NHS services, undermining the founding promise of equal access in practice. Although steps have been taken by the NHS to remove barriers to digital access, such as its national framework for digital inclusion (NHS England, 2024a) and Core20Plus5 (NHS England, 2021, 2022), the 10 Year Health Plan nevertheless recognises how far reality still falls short of 'app first' expectations, by promising continued offline options, and the inclusion of support from sources such as local libraries and general practice administration staff to offer proxy digital access.

What the next decade could look like

If the 10 Year Health Plan delivers as intended, England could see a broad-based improvement in healthy longevity; if progress is uneven, the same reforms risk reinforcing a two-tier pattern of ageing that tracks deprivation, region, and digital capability.

If the 10 Year Health Plan succeeds

A successful plan would reverse the inequality in life expectancy and healthy life expectancy by increasing the age of onset of chronic illness. It would also narrow the gap between the most deprived and the most affluent through better prevention, earlier diagnosis, and more consistent management of cardiovascular, metabolic, and mental health conditions. In this scenario, more older people and multimorbidity patients would be supported safely at home by integrated community teams, virtual wards, and intermediate care – i.e., care designed to support recovery after leaving hospital, also known as rehabilitation and reablement – with social care capacity sufficiently increased that hospital discharge delays become the exception rather than the norm (Acheson, 2026). Hospitals would then focus on treating genuinely acute conditions and other specialist activity, with improved patient flow as fewer older adults are admitted for preventable crises, and more are discharged promptly into reliable home or community-based care.

Critically, narrowing deprivation-related gaps in healthy ageing would require that preventive programmes, digital tools, and community services reach the most deprived areas and digitally excluded groups as effectively as the more affluent, online populations. If this succeeds, the current 19 to 20-year gap in healthy life expectancy between the most affluent and most deprived local areas could begin to shrink, reducing the extent to which location and income define later life health outcomes.

If progress is uneven

A probable risk, however, is that progress will be patchy. Digital tools, from the NHS App to remote monitoring, are most readily used by people with the necessary devices, skills, confidence, and stable internet connectivity, who are already healthier on average than those without (NHS England South East, 2026). In this world, the benefits of faster access to care, proactive care – i.e., the identification of individuals at high risk and inviting them for examinations in advance (e.g., cancer screening programmes) – and health self-management accrue disproportionately to those who are already advantaged, while older adults with limited digital literacy or language skills continue to struggle to access services at all.

At the same time, community-based care models may be stretched thinnest in the very places that need them most.

Analysis already highlights persistent social care capacity shortfalls and large regional variation in rehabilitation and home care availability, with reablement bottlenecks a leading cause of delayed hospital discharge for older patients (CQC, 2025). If such funding and workforce constraints persist, 'care closer to home' could, in practice, actually mean longer waits, shorter visits, and reinforcing a postcode lottery in how – and how well – people age.

Implications beyond healthcare

From an actuarial perspective, the defining test of the 10 Year Health Plan is not only whether it raises the average life and healthy life expectancy, but whether it avoids creating the conditions for the continued emergence of two distinct longevity futures: one for those who can fully navigate, engage with, and benefit from the reformed system, and one for those who cannot. For actuaries, current pricing and reserving models already reflect strong longevity differentials by postcode and socioeconomic status. For example, annuity and protection business is disproportionately concentrated on more affluent groups.

The extent to which the 10 Year Plan either counteracts or reinforces these underlying geography and affluence-based gaps will shape not only headline longevity trends, but also the stability of assumptions about who benefits from future mortality improvements. These divergent futures carry wider consequences – for example, if the onset of serious ill health is delayed and functional independence better preserved, more people in their 60s and early 70s may be able and willing to work, hence smoothing retirement transitions, supporting labour supply in an ageing economy, and contributing towards achieving the 'second demographic dividend' (as explored by Tanya Singh [elsewhere](#) in this *Bulletin*). Conversely, if morbidity remains high and unevenly distributed across society, we can expect continued growth in health-related economic inactivity and earlier, often involuntary, exits from the workforce in more deprived regions.

Patterns of retirement saving and product demand will change accordingly. Healthier, clearer, more predictable later-life health trajectories support planning for both retirement and longer working lives, as less volatile health trajectories make the trade-off between annuitisation and holding large precautionary balances into retirement easier for people to manage. At the same time, clarity about longevity and morbidity risks is likely to drive growing interest in products that hedge longevity, or insure against the risk of long stays in residential or nursing care (where such cover is available). Conversely, more uncertain or unequal trajectories may push better-off households towards precautionary saving – such as self-insurance or housing wealth – and insurance products, such as immediate

needs annuities, where they can afford it, whilst others are pushed back onto dependence on means-tested or other state support as care costs continue to rise.

Finally, informal caregiving and its pressures on families and local authorities sit at the heart of both scenarios. Strong community and social care capacity can stabilise caring roles and reduce carer strain; persistent gaps, by contrast, increase the intensity and duration of unpaid care, and raise the likelihood that local authorities face rising demand from older people whose needs have escalated in the absence of timely support. In this sense, the 'defining test' of the 10 Year Health Plan is not only how long people live, but how evenly the gains – and the burdens – of longer lives are shared.

Longevity as a social contract

The 10 Year Health Plan can be read as an attempt to renegotiate the social contract around longer lives: in return for a more prevention-focused, data-driven NHS, citizens are asked to participate earlier, more proactively, and to make more use of digital tools in managing their health. Prevention, technology, and inequality are inseparable in this bargain; a plan that expands screening, digital access, and community support, but fails to narrow the healthy life expectancy gap between affluent and deprived regions will have fallen short on its own terms.

Whether the system moves toward equally shared benefits of healthier ageing or deeper socioeconomic divides will shape future outcomes not just for health, but also for public finances, labour markets, intergenerational fairness, pension and care costs, and the distribution of work and unpaid caregiving.

On the equitable future path, later onset of morbidity would delay the onset and intensity of unpaid caregiving. If retirement ages are unchanged, then state pension costs would also increase, as would the amount of private savings required to secure a given level of retirement income over an extended lifespan.

On the deeper socioeconomic divides path, caregiving and ill-health would remain concentrated at younger ages for some groups, while others would enjoy longer periods of healthy retirement, with clear implications for fairness. From an actuarial perspective, this points to the need for a consistent health system and longevity monitoring framework. There would be a small, stable set of routinely tracked indicators – e.g., life and healthy life expectancy by deprivation, major disease incidence, digital access, and social care dependency – explicitly linked to assumptions for mortality improvements, morbidity trends, and product design.

References

- Acheson, M. (2026). *Hospital discharge delays leave elderly at risk of unsafe discharge in the UK*. Elder. <https://www.elder.org/news/hospital-discharge-delays-leave-elderly-at-risk/> [Accessed 19 June 2026.]
- Care Quality Commission (CQC) (2025). *The state of health care and adult social care in England 2024/25*. <https://www.cqc.org.uk/publications/major-report/state-care/2024-2025> [Accessed 19 June 2026.]
- Comas-Herrera, A., Knapp, M., Wittenberg et al., on behalf of the MODEM Project group (2017). MODEM: a comprehensive approach to modelling outcome and costs impacts of interventions for dementia (Protocol paper). *BMC Health Services Research*, 17, 25. <https://doi.org/10.1186/s12913-016-1945-x>
- Department of Health & Social Care (DHSC) (2025). *Health trends and variation in England, 2025; a Chief Medical Officer report*. <https://www.gov.uk/government/publications/health-trends-and-variation-in-england-2025-a-chief-medical-officer-report> [Accessed 19 June 2026.]
- Department of Health & Social Care (DHSC) (2026). *Neighbourhood health framework*. <https://www.gov.uk/government/publications/neighbourhood-health-framework/neighbourhood-health-framework> [Accessed 19 June 2026.]
- Diwakar, V. and Owolabi, B. (2025). *Tackling digital exclusion and health literacy: how libraries can help bridge the gap*. NHS England. <https://www.england.nhs.uk/blog/tackling-digital-exclusion-and-health-literacy-how-libraries-can-help-bridge-the-gap/> [Accessed 19 June 2026.]
- Farmsworth, A., Fellows, J., Foster-Hall, D. and Wright-Anderson, P. (2022). *Managing NHS backlogs and waiting times in England*. National Audit Office. <https://www.nao.org.uk/reports/managing-nhs-backlogs-and-waiting-times-in-england/> [Accessed 19 June 2026.]
- Gerhold, M. (2022). *Plan for Digital Health and Social Care contains important ambitions, but tackling workforce and capacity pressures will be the key to realising the vision*. The Health Foundation. <https://www.health.org.uk/press-office/press-releases/plan-for-digital-health-and-social-care-contains-important-ambitions> [Accessed 19 June 2026.]
- Holmås, T.H., Islam, M.K. and Kjerstad, E. (2013). Interdependency between social care and hospital care: the case of hospital length of stay. *The European Journal of Public Health*, 23(6): 927–933. <https://doi.org/10.1093/eurpub/cks171>

Imison, C. (2023). *Multiple long-term conditions (multimorbidity) and inequality - addressing the challenge: insights from research*. National Institute for Health and Care (NIHR) Evidence. https://doi.org/10.3310/nihrevidence_59977

Kingston, A., Robinson, L., Booth, H., Knapp, M. and Jagger, J. (2018). Projections of multi-morbidity in the older population in England to 2035: estimates from the Population Ageing and Care Simulation (PACSim) model. *Age and Ageing*, 47(3): 374–380. <https://doi.org/10.1093/ageing/afx201>

Lloyds Banking Group (2025). *2025 Consumer Digital Index: the generative AI edition*. <https://www.lloydsbankinggroup.com/media/consumer-digital-index.html> [Accessed 19 June 2026.]

Mercer, S., Henderson, D., Huang, H. et al. (2021). Integration of health and social care: necessary but challenging for all. *British Journal of General Practice*, 71(711): 442–443. <https://doi.org/10.3399/bjgp21X717101>

NHS England (2021). *Core20PLUS5 (adults) – an approach to reducing healthcare inequalities*. <https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/> [Accessed 19 June 2026.]

NHS England (2022). *Core20PLUS5 – an approach to reducing health inequalities for children and young people*. <https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/core20plus5-cyp/> [Accessed 19 June 2026.]

NHS England (2024a). *Inclusive digital healthcare: a framework for NHS action on digital inclusion*. <https://www.england.nhs.uk/long-read/inclusive-digital-healthcare-a-framework-for-nhs-action-on-digital-inclusion/> [Accessed 19 June 2026.]

NHS England (2024b). *Virtual wards*. <https://www.england.nhs.uk/virtual-wards/> [Accessed 19 June 2026.]

NHS England South East (2026). *Growing NHS app use in the South East as digital services improve access and convenience for patients*. <https://www.england.nhs.uk/south-east/2026/01/23/growing-nhs-app-use-in-the-south-east-as-digital-services-improve-access-and-convenience-for-patients/> [Accessed 19 June 2026.]

Ofcom (2025). *Exploring how people in the UK are affected by 'digital disadvantage'*. <https://www.ofcom.org.uk/internet-based-services/technology/exploring-how-people-in-the-uk-are-affected-by-digital-disadvantage> [Accessed 19 June 2026.]

Office for National Statistics (ONS) (2026). *Healthy life expectancy, UK: between 2011 to 2013 and 2022 to 2024*. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/bulletins/healthstatelifeexpectanciesuk/between2011to2013and2022to2024> [Accessed 19 June 2026.]

Stiebahl, S. and Balogun, B. (2025). *Inequalities in life expectancy*. London: House of Commons Library. <https://commonslibrary.parliament.uk/research-briefings/cbp-10324/> [Accessed 19 June 2026.]

UK Government (2025). *Fit for the future: 10 Year Health Plan for England* (CP 1350). London: UK Government. <https://www.gov.uk/government/publications/10-year-health-plan-for-england-fit-for-the-future> [Accessed 19 June 2026.]

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Gerotherapeutics: what would targeting human ageing mean for disease prevention, life expectancy, and financial risk?

Richard Faragher, Professor of Biological Gerontology at the University of Brighton
Guy Coughlan, Chief Operating Officer at Clota Varde

Introduction

Global life expectancy at birth has more than doubled in just four generations, rising from 32 years in 1900 to 73 years in 2023 (Herre, 2025). However, it is extremely rare to grow old in good health, and – with multimorbidity now the norm rather than the exception – by the age of 85 almost nobody is disease-free (Collerton et al., 2009). These disease burdens are primary drivers of the increases in the percentage of GDP that nations spend on healthcare as populations age (Tran et al., 2022).

Accordingly, there are now increasing global attempts to shift healthcare systems towards a more prevention-based approach, taking pre-emptive measures intended to reduce the frequency and severity of disease. As discussed by Nicky Draper and Mohamed Elsheemy **elsewhere** in this *Bulletin*, *Fit for the Future: 10 Year Health Plan for England* (UK Government, 2025) is an example of this approach. Through a combination of reduced exposure to chronic disease risk factors, along with both better and earlier detection and treatment, it is hoped that population health – and thus life expectancy, particularly in the lower socioeconomic strata – will improve.

When considering such prevention strategies, it is worth noting the comprehensive evidence that adopting just four straightforward behavioural interventions during middle age – in particular, smoking cessation, moderate alcohol intake, increased fruit and vegetable consumption, and higher levels of physical activity – can add up to 14 years to healthy life expectancy (Khaw et al., 2008). Unfortunately, however, translation of this understanding into effective population-level public health interventions and policies has been disappointing to date, with uptake uneven, and improvements typically concentrated amongst the financially secure and the already health-conscious (House of Lords, 2021). For example, the proportion of smokers in the most deprived areas of England and Wales was more than three times higher than in the least deprived

areas, and over a quarter of smokers in England and Wales live in the most deprived areas (ONS, 2023). Thus, it is at least questionable whether the types of ‘conventional’ measures so often favoured by some policy makers – such as restricting ‘junk food’ advertising, banning chips in schools, introducing new standards for alcohol labelling, or encouraging participation in sport – will achieve very much amongst those most at risk. This, in combination with the inexorable increase in the average age of the global population (UN, 2025), therefore seems to foreshadow a tidal wave of ill-health.

Known ageing mechanisms

Fortunately, in parallel with the ageing of the population, considerable progress has also been made in understanding the mechanisms by which the ageing process itself operates. Since the early 1980s, an expanding series of ageing mechanisms – or ‘hallmarks’ – have been progressively identified (shown in *Table 1* on the following page), each of which is associated with a substantial evidence base in the primary biomedical literature drawn from the study of both animals and humans. Unlike traditional risk factors – such as smoking or obesity – these mechanisms operate upstream of individual diseases associated with ageing, and are common to many of them.

Modulating these mechanisms in animals (typically rodents) in a positive way produces dramatic improvements in health, leading to equally impressive improvements in lifespan (Gkioni et al., 2025). Conversely, in humans rare genetic diseases in which the hallmark mechanisms are compromised – such as the accelerated cell senescence disorder Werner’s syndrome – can reduce life expectancy by up to 30 years (Cox and Faragher, 2007). This is a reduction roughly double the difference in life expectancy between the lowest and highest UK socioeconomic groups (House of Lords, 2021).

Table 1: The twelve known hallmarks of ageing. (Source: López-Otín et al., 2023.)

Hallmark	Description
 Genomic instability	DNA accumulates damage over time from environmental factors and normal cellular processes, which then disrupts normal cellular function, and leads to tumour formation.
 Telomere attrition	Each time mammalian cells divide, their telomeres – i.e., the protective ‘caps’ on the ends of chromosomes, similar to the plastic tips on shoelaces – shorten, until they become so short as to trigger both cellular senescence (see below), and an inflammatory cascade at the cell level.
 Epigenetic alterations	Functional groups on DNA that control which genes are turned on or off become disrupted over time cause cells to lose their specialised identities and function improperly.
 Loss of proteostasis	Cells lose their ability to properly fold, maintain, and dispose of proteins – i.e., the molecular ‘machines’ inside cells that help them do their work – and the accumulation of these damaged or misfolded proteins can cause cellular dysfunction.
 Disabled macroautophagy	Cellular recycling systems that break down and reuse/remove old or damaged components deteriorate, allowing toxic debris – i.e., cellular ‘waste’ – to accumulate inside cells.
 Dysregulated nutrient sensing	Cellular mechanisms – such as insulin signalling – that detect and respond to nutrients – e.g., sugar, amino acids, etc. – become dysfunctional, causing reduced or improper responses, and hence metabolic problems, e.g., diabetes.
 Mitochondrial dysfunction	Mitochondria – the ‘power plants’ of cells – become damaged and inefficient at producing energy, leaving cells energy-depleted and hence likely to die.
 Cellular senescence	Damaged cells that be removed enter a ‘zombie’ state where they can no longer divide but remain alive, secreting harmful inflammatory compounds that damage surrounding healthy tissue.
 Stem cell exhaustion	The body's reserve of stem cells – i.e., specialised repair/‘starter’ cells – becomes depleted or dysfunctional, limiting the regenerative capacity of key tissues.
 Altered intercellular communication	Communication between cells becomes disrupted – particularly through increased chronic inflammation (see below) – causing meaningful cellular signals to be confused, and/or drowned out in molecular noise.
 Chronic inflammation	Low-grade, persistent inflammation throughout the body with age (often called ‘inflammaging’) both damages tissues and increases over time, and – unlike acute inflammation that heals injuries – this chronic state accelerates deterioration across organ systems.
 Dysbiosis	The community of microorganisms living in the gut becomes imbalanced with age – losing beneficial species and gaining harmful ones – and so disrupts digestion, immunity, and even brain function through the gut-brain axis.

Interventions that target these hallmark mechanisms – termed ‘gerotherapeutics’ – therefore have the potential to delay, prevent, or ameliorate multiple conditions simultaneously. This represents a significant conceptual shift in approaches to healthcare and longevity – rather than treating individual diseases or modifying behavioural risk factors, gerotherapeutics target ageing itself. Such interventions could therefore alter not only the incidence of disease, but also the distribution of both morbidity and mortality across the lifespan.

Perhaps the best population-level evidence of the relationship between the hallmarks of ageing and health is the work of Fraser et al. (2022). In this study, the authors text-mined c.920,000 research paper abstracts looking for co-mentions of age-related diseases and the hallmarks of ageing. They were then able to identify the top 30 ranked age-related diseases specifically associated with each hallmark – for example, cellular senescence is tightly linked with cancers, osteoarthritis, chronic kidney disease, viral infection and immunodeficiency, hypertension, chronic obstructive pulmonary disease (COPD), cirrhosis, liver failure, and fatty liver disease. Direct links between these ageing mechanisms and the poor healthy life expectancy of socially disadvantaged and lower socioeconomic groups have also recently been demonstrated (Kivimäki et al., 2024), indicating the potential for new gerotherapeutics to succeed where lifestyle and policy interventions have made limited progress.

Gerotherapeutic prevention: past, present, and future

Discussions of gerotherapeutics often tend to frame them as ‘jam tomorrow’ (Chief Medical Officer, 2023) – in other words, they typically assume little progress for decades, and that the development and deployment of such drugs requires significant shifts in anything and everything from the epistemology of ageing and disease through to the regulatory framework under which existing drugs are developed or repurposed (Nuwer, 2025). However, this framing is rather one-sided, and overlooks important factors such as the:

- History of prevention-based approaches to ageing-related problems
- Near-term impact of health system-level policy changes
- Speed with which the gerotherapeutic sector might expand if their use in multimorbidity prevention became a conscious policy goal, rather than a side-effect of other aims.

For actuaries, this raises some important questions, including:

- How might gerotherapeutics affect life expectancy, healthspan, and the shape of survival curves?

- To what extent could such changes be rapid, uneven, or compounding?
- What would this imply for financial risk in the pensions and life insurance industries?

Some sense of the scope of these potential changes can be grasped from reflecting upon the impact of other, earlier health interventions, three of which we now explore a little further.

Hypertension control: an underappreciated precedent?

Elevated blood pressure – i.e., ‘hypertension’ – occurs almost inevitably with ageing in humans (Gosmanova and Cushman, 2024). Accordingly, population ageing in low- and middle-income countries has increased the global level of adult hypertension from 650 million people in 1990 to 1.4 billion – i.e., around 33% – in 2024 (World Health Organisation, 2025). Although high blood pressure is now recognised as a central driver of later-life disease, its treatment only became salient in the 1960s, as a result of actuarial studies identifying it as a major risk factor for cardiovascular disease (Kotchen, 2011). Prior to this, hypertension was considered to be either ‘benign’ or ‘essential’, the latter on the basis that it was simply a natural, adaptive response by the body to keep blood flowing through old, sclerotic vessels.

The repurposing of diuretic drugs as blood pressure-lowering agents then allowed for randomised, controlled, double-blind trials to demonstrate that antihypertensive treatment helped to prevent multiple diseases, such as strokes, myocardial infarction (heart attacks), and congestive heart failure, regardless of age. The effect of treating this ‘normal ageing change’ on disease prevention has been dramatic – for example, trials have shown antihypertensive therapies reduce stroke incidence by 35%-40%, myocardial infarction by 20%-25%, and the incidence of heart failure by more than 50% (Kotchen, 2011). At the population level, hypertension control also played a key role in reducing age-adjusted mortality rates in the USA for stroke and coronary heart disease by 57% and 63%, respectively, between 1979 and 2007 (Kotchen, 2011). These pharmacological demonstrations of the health and longevity benefits of lower blood pressure subsequently led to the intensive promotion of lifestyle measures to prevent hypertension, which are now a familiar feature of many public health campaigns.

Although perhaps less well known than the more recent emergence and impact of statins, these effects of hypertension are both larger and more evenly distributed. Indeed, the longevity benefits of primary prevention using statins are heavily skewed, and concentrated within an unpredictable minority – for example, although the mean lifespan gain from statin use amongst 50 year-old males is 7 months, 93% of such individuals show no life expectancy gains, whilst the remaining 7% experience a mean increase of 8.25 years (Finegold et al., 2016).

Thus, antihypertensive interventions suggest a compelling precedent for the efficacy of gerotherapeutics in the prevention of multiple diseases, and especially for the plausibility of drug repurposing approaches explicitly to target ageing.

GLP-1 receptor agonists: thinner by design, younger by accident?

Drugs such as the synthetic peptide semaglutide – e.g., Ozempic – activate GLP-1 ('glucagon-like peptide-1') receptors to increase insulin secretion, suppress glucagon levels, slow gastric emptying, reduce appetite, and lower blood glucose. Originally developed to treat diabetes, these drugs are now famous for their ability to support rapid and consistent weight loss in non-diabetics (Batsis et al., 2026). There is also comprehensive evidence that normalising body composition and weight prevents many other non-communicable diseases – i.e., those not caused by infections, and which cannot be transmitted to others – adding somewhere between c.6 and c.7 years to the life expectancy of 40 year olds (Tam et al., 2020), and up to 10 years in younger individuals (Jura and Kozak, 2016). Such evidence has led to this class of drugs being lauded by the UK Government for "their widespread appeal, and potential for transformational population health benefit", and to them being assigned an important role in planned population-level disease prevention interventions and policies, such as "new service models including early access to GLP-1s" as part of *Fit for the Future* (UK Government, 2025).

However, GLP-1 receptors are ubiquitous, and the function of the natural hormone is broad. Postulating that this class of drugs broadly and effectively counteract many age-related changes, Huang et al. (2025) treated mice with the GLP-1 receptor agonist exenatide, and observed both the maintenance of physical function and the prevention of degenerative ageing changes in older animals, all with minimal effects on body weight or appetite. Further analysis revealed that exenatide also reversed changes in several of the hallmarks of ageing, and ageing-associated methylation changes – i.e., chemical modifications to DNA that alter how genes are expressed, but without changing their underlying genetic code – across multiple tissues. These are the basis of the many epigenetic 'ageing clocks', most famously that of Horvath (2013, 2015). Many of these improvements were mediated by the hypothalamus, a structure at the centre of the brain that links the nervous and endocrine (i.e., hormone) systems, as is consistent with earlier studies which showed that stem cell transplantation into the rodent hypothalamus increased healthy lifespan by roughly 25% (Zhang et al., 2017).

These effects are similar to those observed in mammals treated with a class of drugs known as 'rapalogues', which have been shown to both delay ageing in mice and rejuvenate the human immune system in elderly people

(Mannick et al., 2018). Multiple other studies have now reported the beneficial effects of GLP-1 receptor agonists on ageing hallmarks, as well as providing preliminary evidence that semaglutide may also modulate epigenetic age in humans (Corley et al., 2026). Thus, it is possible that population-level use of GLP-1 agonists may prevent disease and increase life expectancy to a much greater extent than might have been predicted based on weight loss alone. For example, scenario modelling by leading global reinsurers suggest that their use could reasonably be expected to drive additional reductions in cumulative mortality over the next 20 years of between c.3 and c.5% for those aged between 20 and 59 in the UK, USA, and Canada (Russell, Gaskell and Falkous, 2026).

Senolytics: preventing cancer and slowing ageing?

Senescent cells are the living but permanently non-dividing forms of cells that would otherwise normally self-replicate within mammalian tissues. Caused by multiple stimuli – most famously, telomere attrition (Faragher, 2021) – senescence describes a state of permanent growth arrest with the production of pro-inflammatory cytokines (known as the senescence associated secretory phenotype, SASP).

Senescence almost certainly evolved to prevent cancer early in life. In young animals, the SASP attracts white blood cells that clear senescent cells from the tissue. However, uncleared senescent cells are accidentally pro-carcinogenic, and the bursts of inflammatory molecules they produce stimulate nearby cells to grow – and thus become cancerous – whilst the senescent cells themselves continue to cause a range of other degenerative changes (e.g., osteoporosis and cognitive impairment). In individuals with Werner's syndrome, the rates at which some cell types enter senescence are increased roughly five-fold (Faragher et al., 1993), leading to their accelerated accumulation within the body, and hence the accelerated ageing of many tissues that goes hand in hand with an increased frequency of tumours. This process also occurs in people without Werner's syndrome, albeit much more slowly.

Genetically engineered mice in which senescent cells can be cleared artificially provide a 'proof of concept' of what might be achievable if they were removed from humans – for example, such mice show better health and maximum lifespans up to 37% longer than their untreated litter-mates (Baker et al., 2016).

Treating senescence in humans requires the use of senolytics, i.e., drugs that selectively target and kill senescent cells. Multiple senolytics are now available in the research arena, with a cocktail of two of the first well-characterised senolytics – i.e., dasatinib and quercetin – being used in several clinical trials (e.g., Gonzales et al., 2023). Although roughly 90% of clinical trials fail, there

have already been successful (albeit modest) outcomes from at least two such trials, and the number of trials in train (e.g., c.30 in various stages as of June 2026, according to clinicaltrials.gov) gives us reason to expect that further success is only a matter of time. That said – and as recent rapid roll-outs of other therapies (e.g., the COVID-19 vaccine) illustrate – wider adoption could potentially occur more quickly if sufficient political and commercial will were brought to bear, and noting that the generic production costs of these compounds equate to just a few pounds per patient each year (Hill et al., 2017).

What form these senolytics will take, and which will be used to treat different conditions, remain open questions. However, their use as tumour prevention agents – as well as to reverse other ageing pathologies – is already an area of active research.

Financial risk: the future is now

Prevention-based approaches are now widely recognised as essential if healthcare systems are to operate both efficiently and effectively in an ageing world. In particular, gerotherapeutic prevention strategies are already (if only accidentally) being implemented within some population-level health policies and will increase both healthy and overall life expectancies, as well as bolster economic growth. Longer, healthier lives mean people can remain productive, contribute more to the labour force and wider economy, save and invest over a longer time horizon, and spend fewer years in poor health and care dependency. With gerotherapeutic support, the long-term future is thus potentially bright with promise, helping to create some of the conditions necessary to reap the second demographic dividend discussed by Tanya Singh [earlier](#) in this *Bulletin*.

However, over the shorter term – and as Philip Clark discusses [elsewhere](#) in this *Bulletin* – increased longevity is likely to increase the required levels and costs of providing income in retirement. The levels of financial stress that will result depend (amongst other things) upon a major biological unknown: the extent to which the different gerotherapeutic interventions we have discussed (e.g., GLP-1 agonists, senolytics, etc.) may, in combination, have enhanced effects. If their effects do indeed compound positively – which is a distinct possibility – they could produce rather more extreme (but biologically plausible) health scenarios and longevity improvements, which could create considerable short-term financial challenges.

We are actively modelling these more extreme outcomes, and – by way of an illustrative example – note that in one such scenario, a combination of gerotherapeutics similar to that recently used in mice by Gkioni et al. (2025) increases life expectancy by 11.7 years for a population starting treatment at age 65. In a forthcoming white paper (advance copies available from the authors on request), Coughlan and

Faragher will explore further the potential impact of such a breakthrough treatment on population-level longevity profiles, the consequences for the solvency of both financial institutions and governments, and the economic ramifications in both the short- and long-term.

For most annuity writers, we estimate that this type of extreme longevity shock could lead to a capital strain that is larger than the total capital they hold, and certainly far larger than that specifically calibrated to cover 'standard', e.g., 1-in-200 longevity risk. In fact, even where providers have reinsured their longevity risk, the resulting stress of these extreme longevity scenarios on their reinsurer counterparties could render such protection effectively worthless (unless those reinsurers also experience sufficient offsetting gains from life protection exposure, as a result of reduced middle-age mortality). Similarly, the liabilities of both public and private sector defined benefit (as well as state) pension schemes would likely also increase to unserviceable levels under such longevity shocks, as systemic effects across the wider global financial system and economy could occur.

Formulating a timely policy response that combines pension reform, broader tax measures, and both labour-market and productivity-enhancing reforms could therefore help to mitigate some of these potential adverse economic effects of gerotherapeutic-driven, prevention-based health strategies. However, any credible such strategy also requires paying close attention to these kinds of extreme longevity and health scenarios, monitoring developments in the gerotherapeutic sector, and developing appropriate response plans to both. With that said, there may be a silver lining; if governments and financial institutions can successfully implement such strategies – and effectively navigate the severe stresses arising from such extreme longevity shocks – there is the potential for truly significant economic benefits over the long term, as a result of people living longer, healthier lives, being productive for longer, and experiencing fewer years in poor health.

References

- Baker, D., Childs, B., Durik, M. et al. (2016). Naturally occurring p16^{Ink4a}-positive cells shorten healthy lifespan. *Nature*, 530: 184–9. <https://doi.org/10.1038/nature16932>
- Batsis, J.A., Gavras, A., Gross, D.C. et al. (2026). Effect of incretin-based and nonpharmacologic weight loss on body composition: a systematic review. *Annals of Internal Medicine*, 17 Apr. <https://doi.org/10.7326/ANNALS-25-00478>

Chief Medical Officer (2023). *Chief Medical Officer's annual report 2023: health in an ageing society*. <https://www.gov.uk/government/publications/chief-medical-officers-annual-report-2023-health-in-an-ageing-society> [Accessed 1 July 2026.]

Collerton, J., Davies, K., Jagger, C. et al. (2009). Health and disease in 85 year olds: baseline findings from the Newcastle 85+ cohort study. *BMJ*, 339: b4904. <https://doi.org/10.1136/bmj.b4904>

Corley, M., Pang, A., Kitch, D. et al. (2026). Epigenetic aging and treatment response to semaglutide in the SLIM LIVER study. *NPG Aging*, 12, 88. <https://doi.org/10.1038/s41514-026-00383-9>

Cox, L.S. & Faragher, R.G. (2007). From old organisms to new molecules: integrative biology and therapeutic targets in accelerated human ageing. *Cellular & Molecular Life Sciences*, 64: 2620-41. <https://doi.org/10.1007/s00018-007-7123-x>

Faragher, R.G., Kill, I.R., Hunter, J.A. et al. (1993). The gene responsible for Werner syndrome may be a cell division "counting" gene. *PNAS*, 90(24): 12030-4. <https://doi.org/10.1073/pnas.90.24.12030>

Faragher, R.G.A. (2021). Simple detection methods for senescent cells: opportunities and challenges. *Frontiers in Aging*, 2, 686382. <https://doi.org/10.3389/fragi.2021.686382>

Finegold, J.A., Shun-Shin, M.J., Cole et al. (2016). Distribution of lifespan gain from primary prevention intervention. *Open Heart*, 3: e000343. <https://doi.org/10.1136/openhrt-2015-000343>

Fraser, H.C., Kuan, V., Johnen, R. et al. (2022). Biological mechanisms of aging predict age-related disease co-occurrence in patients. *Aging Cell*, 21: e13524. <https://doi.org/10.1111/ace1.13524>

Gkioni, L., Nespital, T., Baghdadi, M. et al. (2025). The geroprotectors trametinib and rapamycin combine additively to extend mouse healthspan and lifespan. *Nature Aging*, 5: 1249-1265. <https://doi.org/10.1038/s43587-025-00876-4>

Gonzales, M.M., Garbarino, V.R., Kautz, T. et al. (2023). Senolytic therapy to modulate the progression of Alzheimer's disease (SToMP-AD) - outcomes from the first clinical trial of senolytic therapy for Alzheimer's disease. *Research Square* [Preprint], Apr 24. <https://doi.org/10.21203/rs.3.rs-2809973/v1>

Gosmanova, E.O. & Cushman W.C. (2024). The natural history of untreated hypertension, in Bakris, G.L., Sorrentino, M.J. & Laffin, L.J. (eds.), *Hypertension: a companion to Braunwald's Heart Disease* (4th ed.), Oxford: Elsevier, 209-19. <https://doi.org/10.1016/B978-0-323-88369-6.00017-7>

Herre, B. (2025). *Global average life expectancy has more than doubled since 1900*. <https://ourworldindata.org/data-insights/global-average-life-expectancy-has-more-than-doubled-since-1900> [Accessed 1 July 2026.]

Hill, A., Redd, C., Gotham, D. et al. (2017). Estimated generic prices of cancer medicines deemed cost-ineffective in England: a cost estimation analysis. *BMJ Open*, 7(1): e011965. <https://doi.org/10.1136/bmjopen-2016-011965>

Horvath, S. (2013). DNA methylation age of human tissues and cell types. *Genome Biology*, 14, 3156. <https://doi.org/10.1186/gb-2013-14-10-r115>

Horvath, S. (2015). Erratum to: DNA methylation age of human tissues and cell types. *Genome Biology*, 16, 96. <https://doi.org/10.1186/s13059-015-0649-6>

House of Lords (2021). *Ageing: Science, Technology and Healthy Living. Science and Technology Select Committee: 1st Report of Session 2019-21*. HL Paper 193. https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/Ageing-Science_tech_healthy-living_1stReport.pdf [Accessed 1 July 2026.]

Huang, J., Kwok, A.J., Li, J.C.Y. et al. (2025). Body-wide multi-omic counteraction of aging with GLP-1R agonism. *Cell Metabolism*, 37(12): 2362-2380. <https://doi.org/10.1016/j.cmet.2025.10.014>

Jura, M. & Kozak, L.P. (2016). Obesity and related consequences to ageing. *AGE*, 38, 23. <https://doi.org/10.1007/s11357-016-9884-3>

Khaw, K.T., Wareham, N., Bingham, S. et al. (2008). Combined impact of health behaviours and mortality in men and women: the EPIC-Norfolk prospective population study. *PLOS Medicine*, 5(1): e12. <https://doi.org/10.1371/journal.pmed.0050012>

Kivimäki, M., Frank, P., Pentti, J. et al. (2024). Obesity and risk of diseases associated with hallmarks of cellular ageing: a multicohort study. *The Lancet Healthy Longevity*, 5(7): e454-463. [https://doi.org/10.1016/S2666-7568\(24\)00087-4](https://doi.org/10.1016/S2666-7568(24)00087-4)

Kotchen, T.A. (2011). Historical trends and milestones in hypertension research: a model of the process of translational research. *Hypertension*, 58(4): 522-38. <https://doi.org/10.1161/HYPERTENSIONAHA.111.177766>

López-Otín, C., Blasco, M.A., Partridge, L. et al. (2023). Hallmarks of ageing: an expanding universe. *Cell*, 186(2): 243-78. <https://doi.org/10.1016/j.cell.2022.11.001>

Mannick, J.B., Morris, M., Hockey, H.P. et al. (2018). TORC1 inhibition enhances immune function and reduces infections in the elderly. *Science Translational Medicine*, 10, 449. <https://doi.org/10.1126/scitranslmed.aag1564>

Nuwer, R. (2025). Debunking age-old notions. *Nature*, 647: s8-11. <https://media.nature.com/original/magazine-assets/d41586-025-03525-3/d41586-025-03525-3.pdf> [Accessed 1 July 2026.]

Office for National Statistics (ONS) (2023). *Deprivation and the impact on smoking prevalence, England and Wales: 2017 to 2021*. 21 Apr. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/drugusealcoholandsmoking/bulletins/deprivationandtheimpactonsmokingprevalenceenglandandwales/2017to2021> [Accessed 2 July 2026.]

Russell, R., Gaskell, A. & Falkous, C. (2026). Analysis: GLP-1s and mortality risk: implications for insurers and long-term trend assumptions. *The Actuary*, May. <https://www.theactuarmagazine.org/analysis-glp-1s-and-mortality-risk/>

Tam, B.T., Morais, J.A. & Santosa, S. (2020). Obesity and ageing: two sides of the same coin. *Obesity Reviews*, 21(4): e12991. <https://doi.org/10.1111/obr.12991>

Tran, P.B., Kazibwe, J., Nikolaidis, G.F. et al. (2022). Costs of multimorbidity: a systematic review and meta-analyses. *BMC Medicine*, 20, 234. <https://doi.org/10.1186/s12916-022-02427-9>

UK Government (2025). *Fit for the future: 10 Year Health Plan for England* (CP 1350). London: UK Government. <https://www.gov.uk/government/publications/10-year-health-plan-for-england-fit-for-the-future> [Accessed 2 July 2026.]

United Nations (UN) Department of Economic and Social Affairs: Population Division (2025). *World Population Prospects 2024*. <https://population.un.org/wpp/> [Accessed 2 July 2026.]

World Health Organization (2025). *Hypertension*, 25 Sept. <https://www.who.int/news-room/fact-sheets/detail/hypertension> [Accessed 2 July 2026.]

Zhang, Y., Kim, M.S., Jia, B. et al. (2017). Hypothalamic stem cells control ageing speed partly through exosomal miRNAs. *Nature*, 548: 52-57. <https://doi.org/10.1038/nature23282>

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Guy Coughlan has over 30 years' experience in pensions, investments, longevity, and risk management. He spent most of his career at J.P. Morgan as a Managing Director in senior roles, including Head of Longevity Solutions, Global Head of Risk & ALM Advisory, and Co-head of European Pension Advisory. He was Chief Risk Officer and ExCo member of the Universities Superannuation Scheme and, more recently, Chief Operating Officer at Clota Varde, a corporate finance boutique advising on financing of impact investments. For 20 years Guy has been advising, researching, and speaking about longevity. He also led the development of the LifeMetrics longevity risk framework in 2007, and has published several academic and white papers on the subject.

Longer lifetimes and the fear of running out of savings

Philip Clark, Senior Consultant at Azuria Partners

Longer lifetimes mean a greater need for retirement income, making retirement planning in the absence of guaranteed lifetime incomes increasingly challenging. In this case study from Australia, we consider potential complications and evidence of retirees’ savings withdrawal choices, and ask whether Australian retirees are holding back their spending in retirement because they are worried that their savings will not last. (N.B. All monetary figures are in Australian Dollars.)

A review of Australia’s retirement landscape

Australians not only enjoy some of the world’s highest national life expectancies – as shown in *Table 1* – but also high per capita retirement savings via Australia’s defined contribution superannuation system . There is no obligation to convert ‘super’ funds into guaranteed lifetime income, meaning that retirees bear primary responsibility for generating regular income from their savings, requiring them to make complex decisions over potentially extended retirement horizons, and under considerable uncertainty.

Table 1: Period life expectancies at birth, in years.
(Data source: OECD, 2024.)

Country	Males	Females
Japan	81.1	87.1
South Korea	80.6	86.4
France	80.1	85.9
Australia	81.1	85.1
Netherlands	80.1	83.1
United Kingdom	78.8	82.8
OECD average	77.6	83.0

The Australian superannuation system

Australia’s superannuation (or ‘super’) system is a compulsory retirement savings framework that aims to reduce reliance on the Age Pension, and support adequate retirement incomes for Australians by requiring employers to contribute a legislated percentage of employees’ wages – 12% as of July 2025 – into individual accounts managed by superannuation funds. Established in 1992, it has grown into one of the world’s largest retirement savings systems, with more than 80 Australian Prudential Regulatory Authority (APRA) regulated super funds holding over \$3.5 trillion in assets. Members accumulate savings throughout their working lives within their fund of choice, and – though employers may initially default them into industry funds – workers remain free to choose and switch funds. Upon reaching preservation age – i.e., an eligible age – members may access their savings as lump sums, income streams, or through a combination of the two.

What Australians do have to help manage their own longevity risk, however, is a (federal) government-provided safety net known as the Age Pension: a means-tested, non-contributory benefit available from age 67. As an individual’s assessable income or assets increase, their Age Pension entitlement decreases until it reaches zero, e.g., as is the case for a homeownership couple with c.\$1 million in assets, as of July 2026 (Australian Government: Services Australia, 2026a). This contrasts with other comparable countries and economies such as the UK, where state pensions do not depend on affluence, and are instead intended to provide a key element of post-retirement income for all retirees. The UK approach also simplifies retirement planning considerations in terms of expected future income, due to the lack of interaction between private and the basic state pensions.

The precise amounts, thresholds, and taper rates used to calculate a retiree’s Age Pension entitlement vary depending on individual circumstances, such as whether they are single or in a couple, and whether they own their home or rent.

The Australian Age Pension

Australia’s Age Pension provides a fortnightly income payment to eligible retirees aged 67 and over who meet both residency and means-testing requirements. As of July 2026, the maximum fortnightly rate is approximately \$1,144 for single individuals, and \$1,725 for couples combined (Australian Government: Services Australia, 2026b), indexed twice yearly to reflect changes in both wages and prices.

Means testing is performed through a relatively complex mechanism involving two tests – the ‘income test’, and the ‘assets test’ – with entitlement determined by whichever test produces the lower pension outcome. Under the income test, the pension in July 2026 for a single homeowner (for example) reduces by 50 cents for every dollar of fortnightly income above \$218. Under the assets test, it reduces by \$3 per fortnight for every \$1,000 of assets above \$321K. The precise amounts and eligibility criteria are reviewed periodically, and are reflected in the information published by Services Australia, the (federal) Government welfare agency.

Importantly, the family home is exempt from the assets test, although financial assets – including superannuation – are included once a member reaches age 67. A retiree taking up or ending part-time work, receiving an inheritance or investment returns, making additional super contributions, drawing down superannuation, or releasing equity can all trigger a reduction in entitlements.

To put these safety net amounts into context, the Association of Superannuation Funds of Australia (ASFA) publishes its widely referenced Retirement Standard (ASFA, 2026), which estimates the annual income needed to support different retirement lifestyles. The ASFA’s ‘Modest’ lifestyle covers essential needs with limited discretionary spending, while the ‘Comfortable’ lifestyle allows for greater flexibility, increased spending on leisure and travel, and consumption of higher-quality goods and services.

Figure 1 shows that broadly speaking, the full Age Pension provides slightly less than the ASFA’s ‘Modest’ benchmark, and falls well short of the ASFA’s ‘Comfortable’ level (as well as their ‘Modest’ benchmark for renters). This highlights that the Age Pension is not intended – nor expected – to be able to provide a fully comfortable retirement all on its own. Achieving higher and more stable living standards over increasingly long retirement periods therefore depends on additional superannuation savings.

The Age Pension provides an important safety net for Australian retirees, and is relatively generous given its non-contributory nature, but does not ensure a comfortable retirement.

However, with more than half of Australian retirees currently expected to live to age 90 and beyond (Hennington, 2020), and the Age Pension unlikely to be able to sustain the lifestyle they were accustomed to while working, many retirees face the Fear of Running Out (FORO) of retirement savings.

Figure 1: Comparison of Association of Superannuation Funds of Australia (ASFA) Retirement Standards with full Age Pension entitlements (as of February 2026). (Data source: ASFA, 2026.)





Where it arises, retirees' stress appears to be driven by concerns about risks to their living standards in retirement, such as whether their savings will last, and the challenge of managing complicated financial affairs in retirement.

(Grattan Institute, 2025)

The consequence of this FORO is that retirement savings are frequently underutilised, leading to (potentially substantial) unused savings remaining at death. In particular, rather than drawing the optimum level of funds as retirement income, the Treasury's 2023 Intergenerational Report shows that between 60% and 65% of superannuation account holders default to the minimum statutory drawdown rate (Australian Government: The Treasury, 2023), and highlights an emerging trend in Australia: instead of supporting retirees throughout their own retirement, these unspent funds are being passed down to the next generation by default, diverting resources away from their intended purpose of providing financial comfort in later life. Indeed, the Grattan Institute (2025) estimate that up to 65% of superannuation savings drawn down at the minimum statutory rate will remain unspent by their original account holders.

Not only do these roughly 60–65% of retirees miss out on the opportunity to make the most of the retirement savings that they have accumulated following years of salary sacrifice, but for many, this underspending can also unintentionally compromise their Age Pension entitlements – because the Age Pension is means-tested, retaining unnecessarily high superannuation balances may reduce entitlements, which are periodically reassessed through the recurring assets test.

Excessively cautious retirement spending in Australia could cost retirees twice:

- Firstly, through spending less of their own money than they could have afforded
- Secondly, from reduced support from the Age Pension, due to increased savings being penalised under its assets test.

Retirement Income Covenant (RIC) support for retirees facing complex retirement decisions

In this context, the Retirement Income Covenant (RIC) – issued by the Australian Treasury – came into effect on 1 July 2022, and requires superannuation funds to help their members manage their income in retirement (Australian Government: The Treasury, 2022).

The RIC obliges superannuation fund trustees to develop, publish, and implement a retirement income strategy that articulates how the fund will support members navigate the 'trilemma' of three core and competing objectives:

- Maximising expected retirement income
- Managing the risks to the sustainability and stability of that income (i.e., avoiding running out of savings)
- Ensuring flexible access to savings.

In practice, superannuation funds need to ensure that their investment options, product design, member guidance and support, and communications all work together to help members plan their retirement finances confidently, and avoid leaving savings unspent through a lack of understanding.

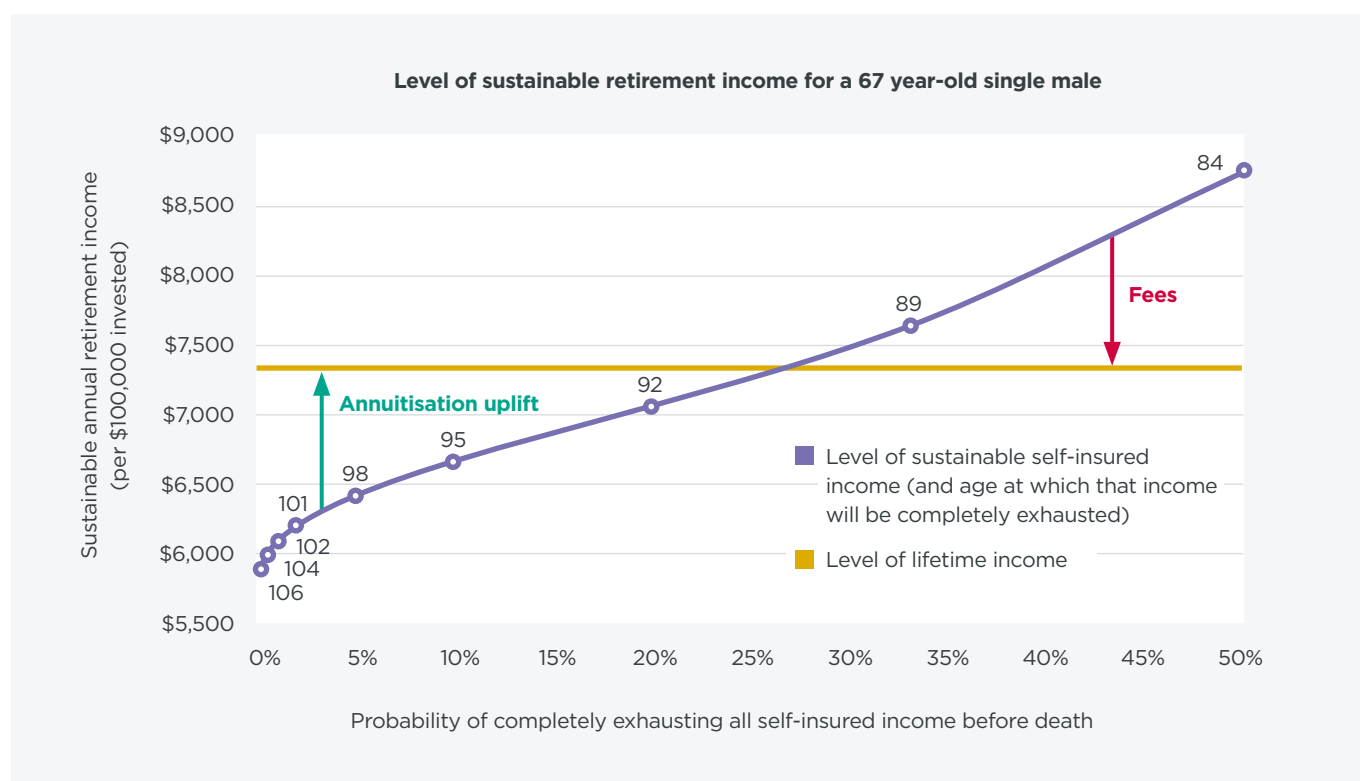
Actuaries have a unique role to play in managing the conflicting objectives of the RIC, because they are equipped with the skills to quantify the risk of 'running out of money', turning an abstract and emotional fear into something measurable and actionable. They can help answer questions such as "what is the maximum retirement income I can sustainably draw down with a level of certainty of x% it will not run out?", which requires the combination of financial and longevity modelling with Age Pension eligibility projections.

Actuaries are challenged further to demonstrate the value of lifetime income solutions – including guaranteed annuities and Innovative Retirement Income Streams (IRIS) – which provide longevity protection while allowing flexibility in the choice of underlying, regulated assets (and typically with investment return-adjusted levels to ensure sustainable income streams, even when these returns are poor). Since annuities are not yet culturally embedded in Australia, savers still need to be taught what lifetime income products are and shown, quantitatively, why (and how) they can both stabilise and improve financial outcomes.

Demonstrating the value of lifetime income streams

One way of demonstrating the value of securing a lifetime income is to show that, if people wish to have some level of certainty that they will not outlive their savings, purchasing an annuity can lead to a higher annual income than a self-managed drawdown approach. *Figure 2* shows the level

Figure 2: Annuitisation uplift illustration (based on Australian Life Table (ALT) 2020–2022 survival, and assuming asset returns of 5% p.a.). (Data source: Australian Government Actuary (2024) and calculations by the author.)



of sustainable retirement income for a typical 67-year-old Australian man, under various different risk tolerances.

Figure 2 shows that if a retiree was willing to have a 50% chance of running out of funds before their death, then they could draw down around \$8,750 of their savings each year, per \$100,000 invested. Conversely, if they wanted to have only a 10% chance of outliving their savings, they could only draw down around \$6,650 p.a. per \$100,000 invested. Alternatively, the individual could instead purchase an annuity of around \$7,330 p.a. per \$100,000 invested, where the risk of this income running out is related only to the failure of the providing insurer, which is very low.

Under this framework, the more risk-averse the retiree is, the greater the benefit obtained from buying an annuity. For a 5% risk of outliving savings, the annuitisation uplift can be more than 15%, depending on the discount rate (asset return), and the various fees embedded in the lifetime income product (covering, e.g., profit margins, cost of capital, expenses, etc.). In other words, longevity self-insurance in retirement can cost as much as 15% more than annuitisation.

However, risk aversion is not the only factor affecting retirement income. Lifetime income products also influence Age Pension entitlements, as both the assessable assets and income are impacted by the purchase of a lifetime income

– specifically, only a portion of the lifetime income purchase premium is included in the asset test (depending on age), while a portion of the purchased income itself is included in the income test. The partial deduction of the premium from the asset test reflects the fact that the purchased product is itself an asset to the retiree, and – since the Age Pension is determined by whichever individual means-test produces the lower entitlement – any potential double-counting of this treatment from elements covered by both the income and asset tests is (by design) avoided.

For an increasing share of middle-income Australian retirees, Age Pension entitlements can initially be increased through the purchase of a lifetime income product, since this reduces the value of assets included in the assets test. However, this purchase will increase assessable income under the Age Pension income test, which can then become the binding constraint, and – despite the lower assets – act to reduce Age Pension entitlements.

The purchase of a product delivering a high level of lifetime income can therefore in fact be penal to the Age Pension entitlements of otherwise-eligible retirees, and act to reduce or eliminate their Age Pension payments via the income test. By contrast, the impact of such purchases on the means-tested entitlements of retirees unlikely to ever qualify for the Age Pension may be broadly neutral.

The interaction between the Age Pension and lifetime income products can quickly become complex, and the net present value (NPV) of this interaction is generally beyond the understanding of a typical retiree. Properly understanding the long-term impact of purchasing a lifetime income product on Age Pension entitlements, therefore, requires actuarial skills. At a high level, our modelling shows that the higher the initial asset, the lower the proportion of this asset that can be invested into a lifetime income without adverse implications for Age Pension entitlements (through the binding income test).

Provided the allocation of assets to lifetime income product purchase falls within an optimal range, the NPV of the additional Age Pension received during retirement may be worth up to 30% of the amount invested in that product. This is purely as a result of the concessional treatment of lifetime income streams within Age Pension means-testing, and independent of the separate annuitisation uplift effect discussed earlier. However, when this Age Pension effect is added to the annuitisation uplift, the same amount invested in a lifetime income product – rather than retained in a drawdown-only strategy – may generate up to 45% more sustainable income.

Crucially, these gains do not stem from taking on additional investment risk *per se*, but rather from more efficient income and asset structuring in the relatively shorter term. The case for purchasing lifetime income products therefore rests on their ability to generate higher sustainable income from a given amount of savings than longevity self-insurance during a retiree’s remaining lifetime, even in scenarios with nil or adverse Age Pension effects. As noted by Hennington

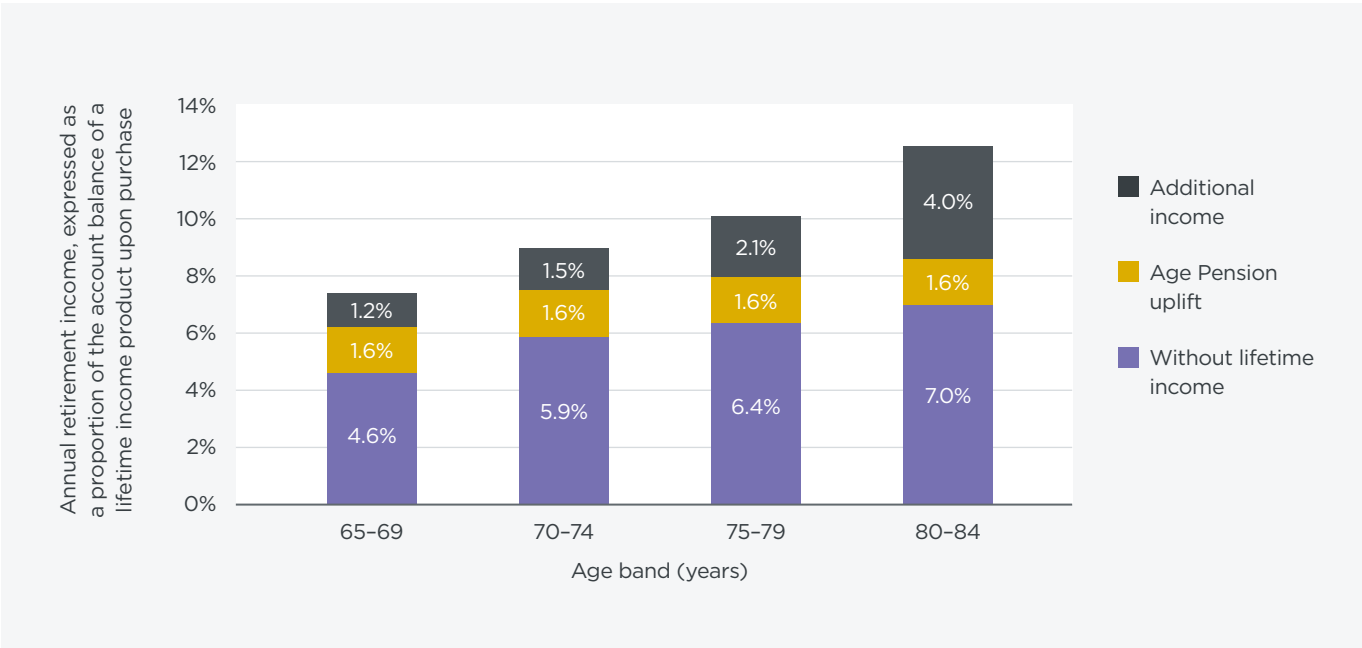
and Boal (2022) using Australian Government Actuary calculations: “Lifetime income streams can be combined with account-based products to design solutions that meet a balance of carefully calibrated objectives and deliver 15% – 30% higher incomes”.

How does supporting retirees with FORO affect their spending?

Having illustrated the complexity of determining a sustainable retirement income over an ever-increasing expected lifetime, while staying within an acceptable risk of running short of savings, the core question is: does supporting retirees in assessing and managing their risk of running out of retirement savings lead to higher spending of those savings?

Blanchett and Finke (2025) provide independent evidence from the United States, suggesting that the answer to this question is yes, and their research shows that retirees consistently underspend retirement savings with no guaranteed annual income. In contrast, they are far more willing to spend from guaranteed lifetime income sources. Converting savings into guaranteed lifetime income streams can therefore substantially increase spending in retirement, with evidence suggesting that retirees may spend up to 80% more than if they relied solely on flexible savings. While Blanchett and Finke’s study focuses on the United States, it offers useful parallels: American retirees must also manage their own drawdown strategies in an analogous way to their Australian counterparts (albeit with less complexity in terms of the interaction between basic state pensions and their own private assets and income).

Figure 3: Annual retirement income by age group following purchase of a lifetime income stream.
(Data source: AMP 2025 MyNorth Lifetime product holder data; adapted from Liu (2025) with the author’s permission.)



In an Australian context that considers the Age Pension safety net, Estelle Liu's work at AMP Super has shown that when retirees with lifetime income products are provided with tailored guidance on how these products interact with the Age Pension, they become more confident in drawing down their remaining retirement savings outside of their retirement income products (Liu, 2025). AMP Super has illustrated the impact of actively assessing and managing FORO through its own IRIS product, North Lifetime. According to AMP Super data, this approach has resulted in an increase in retirement income of around 60% among those using North Lifetime, driven by a combination of the annuitisation uplift, Age Pension effect, and a greater confidence in spending their remaining savings (with the proportion of retirees drawing only the statutory minimum level from their funds declining from 44% to 13%).

Figure 3 illustrates how retirement income, when expressed as a percentage of the account balance at take-up of the lifetime income option, increases following investment in a lifetime income product.

Once relieved of their concerns about the risk of outliving their savings, retirees tend to draw more confidently from their pension accounts. Liu notes: "Once consumers address their fear of running out, they are more confident to draw down higher income from their flexible income account".

Together with Blanchett and Finke (2025), Liu's findings demonstrate that when retirees are supported with tools, products, and advice to manage their own longevity risk, their psychological barriers to spending retirement savings are reduced, allowing them to consume at levels closer to their optimal economic level. In other words, actively supporting retirees in managing the risk of outliving their savings directly increases their confidence to spend them, and thus improves their standard of living in retirement.

The actuary's role in tackling tackling FORO

Australia's retirement income challenge is in large part about confidence – in the absence of compulsory annuitisation, retirees navigate complex trade offs between income optimisation, sustainability, and flexibility of access to savings. The resulting FORO drives drives many to underspend in retirement, which lowers living standards and reduces the overall effectiveness of both superannuation and – through its asset means test – the Age Pension.

Actuarial expertise can transform this uncertainty into a measurable, manageable risk. By helping retirees directly address their own longevity risk through strategies such as lifetime income products, actuaries can build retirees' confidence, support their higher sustainable spending in retirement, and improve their retirement outcomes, consistent with the goals of the RIC.

There are wider learnings for other countries here too, as defined contribution pensions become more prevalent and, indeed, the key source of income for retirees. Guaranteed income products can not only provide peace of mind, but also allow for optimal retirement income structuring, especially in the presence of complicating factors such as a means-tested state pension. By giving them greater confidence to draw down their remaining retirement savings in the presence of a guaranteed income, retirees are more likely to be able to enjoy the lifestyle that their hard-earned savings were always intended to support.

References

- Association of Superannuation Funds of Australia (ASFA) (2026). *Retirement standard*. <https://www.superannuation.asn.au/consumers/retirement-standard/> [Accessed 9 July 2026.]
- Australian Government: Australian Government Actuary (2024). *Australian Life Tables 2020-22*. <https://aga.gov.au/publications/life-tables/australian-life-tables-2020-22> [Accessed 9 July 2026.]
- Australian Government: Services Australia (2026a). *Assets test*. <https://www.servicesaustralia.gov.au/assets-test-for-age-pension?context=22526#a2> [Accessed 3 July 2026.]
- Australian Government: Services Australia (2026b). *Income test*. <https://www.servicesaustralia.gov.au/income-test-for-age-pension?context=22526> [Accessed 3 July 2026.]
- Australian Government: The Treasury (2022). *Retirement income covenant*. <https://treasury.gov.au/policy-topics/superannuation/retirement-framework> [Accessed 9 July 2026.]
- Australian Government: The Treasury (2023). *2023 Intergenerational Report*. 24 Aug. <https://treasury.gov.au/publication/2023-intergenerational-report> [Accessed 3 July 2026.]
- Blanchett, D. and Finke, M. (2025). Retirees spend lifetime income, not savings. *Financial Planning Review*, 8(3). <https://doi.org/10.1002/cfp.2.70010> [Accessed 9 July 2026.]
- Clark, P. (2025). *Guaranteed income or investment-linked income: a framework to choose the right retirement income product*. CEPAR 33rd Colloquium on Pensions & Retirement Research. <https://www.cepar.edu.au/sites/default/files/2026-07/Philip%20Clark.pdf> [Accessed 10 July 2026.]

Coates, B., Moloney, J. and Suckling, E. (2025). *Simpler super: taking the stress out of retirement* (Grattan Institute Report No. 2025-01). <https://grattan.edu.au/report/simpler-super/> [Accessed 9 July 2026.]

Hennington, J. (2020). *Standard deviation around life expectancy is eight years – what this means for retirees*. Actuaries Institute, 12 Aug. <https://www.actuaries.asn.au/research-analysis/standard-deviation-around-life-expectancy-is-eight-years-what-this-means-for-retirees> [Accessed 3 July 2026.]

Hennington, J. and Boal, A. (2022). *A framework to 'maximise' retirement income*. Actuaries Institute. <https://content.actuaries.asn.au/resources/resource-ce6yyqn64sx3-2093352434-54992> [Accessed 3 July 2026.]

Huang, F., Hui, F.K.C. and Villegas, A.M. (2025). *Towards fairer retirement outcomes: socio-economic mortality differentials in Australia*. Paper prepared for the Actuaries Institute All Actuaries Summit 2025, Sydney. <https://ssrn.com/abstract=5253598> or <http://dx.doi.org/10.2139/ssrn.5253598> [Accessed 9 July 2026.]

Liu, E. (2025). *Solving for fear, not just longevity: demystifying the true value of innovative retirement income streams*. CEPAR 33rd Colloquium on Pensions & Retirement Research. <https://www.cepar.edu.au/sites/default/files/2026-07/Estelle%20Liu.pdf> [Accessed 10 July 2026.]

OECD (2024). *Society at a glance 2024: OECD social indicators: life expectancy*. https://www.oecd.org/en/publications/society-at-a-glance-2024_918d8db3-en/full-report/life-expectancy_37a61588.html [Accessed 9 July 2026.]

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Living longer: implications for the UK State Pension

This is an edited version of the response to the third State Pension age review provided by the Institute and Faculty of Actuaries in October 2025. Any developments or updates since that time, such as the publication of the interim report of the second Pensions Commission in May 2026, should be taken into account

As more of us live ever longer lives, a key question for society is how these extra years can be shared between work, family life, and retirement, and how far retirement provision should depend on public funding or private savings. Few public policies address this question more directly than the State Pension, which in the UK provides a taxpayer-funded basic income from a specified age in later life, irrespective of recipients' wealth, health, or whether they face illness or frailty. But as the UK population ages – and in the absence of any benefit changes – the cost of these pensions continues to rise, and the Government faces increasingly difficult choices about how to keep the system affordable without leaving people exposed at precisely the point when they may be least able to provide for themselves.

In the UK, the Pensions Act 2014 (UK Parliament, 2014) requires the Government to review the State Pension age ('SPA') at least once every six years, and during each Parliament (that is, to keep under review the age from which those who are eligible may first claim a State Pension). Following the proposals of the most recent previous review in 2023 (UK Government, Department for Work & Pensions, 2023), under existing legislation the SPA is already scheduled to rise to 67 between 2026 and 2028, and then to 68 between 2044 and 2046. In July 2025, the Government announced the launch of the latest review (UK Government, Department for Work & Pensions, 2025), which will consider evidence from:

- **An independent report**, led by Dr Suzy Morrissey, Deputy Director of the Pensions Policy Institute (PPI), on specified factors relevant to the review of the SPA
- **A report from the Government Actuary's Department** assessing the latest UK life expectancy projections, and their implications for the SPA.

Past reviews have tended to focus on proposals to increase the SPA, reflecting the fact that – on average – people are living longer. The aim of such reviews is principally to preserve the affordability of the State Pension to ensure that it remains sustainable for future generations. This is done by

keeping the amount of time that most people will spend in retirement as a proportion of their total lifespan similar over time. With falling birth rates, these affordability issues are compounded as a smaller working-age population faces the rising costs of the State Pension, which in the UK operates on a 'pay-as-you-go' basis whereby current taxes pay the benefits of current pensioners.

What life expectancy really means in the context of the State Pension

Headlines about life expectancy can often be misleading. When we hear that a child born today may expect to live into their mid-80s – or that a growing minority may even reach age 100 – it is tempting to imagine life expectancy as a kind of fixed personal destination, and that almost everyone will live to that point (or to an age very close to it). In reality, however, life expectancy is an average drawn from a wide population distribution: some people will die much earlier than their projected life expectancy, while others will live well beyond the average.

This matters because public debate often assumes that longer life expectancies automatically mean that everyone can continue working to a higher age. This is simply not true. Improvements in longevity are often driven by increased survival at older ages, and especially among those who are already relatively advantaged in their health and financial circumstances. This increase in survival rates among those in their 80s and 90s does not necessarily tell us much about the health, savings, or work capacity of people in their early-to-mid 60s, when support from a State Pension may begin to be needed.

There is also an important difference between living longer and living longer in good health. Healthy life expectancy varies significantly across different socioeconomic groups – e.g., according to income, region, and occupation. For example, an office-based professional in good health may reasonably expect to continue working later in life, whereas someone in a physically demanding job, or with a long-term illness or caring responsibilities, may not have that option.

State Pension age: beyond a mechanistic approach

Objectively linking the SPA to life expectancy in a clearly defined manner has an obvious logical appeal. If people are (on average) expected to live longer, then delaying the age at which their pension payments begin can both reduce costs, and help to stabilise the balance between working life and retirement as a proportion of total lifetimes. It also – as discussed further below – speaks to a sense of intergenerational fairness: younger generations should not be asked to fund ever-longer and increasingly expensive retirements of older generations without at least some adjustment.

But this logic has its limits. The State Pension is not simply a financial product that pays out in proportion to future life expectancy, rather it is also an important form of social protection: a simple, predictable, universal foundation of income for those at older ages. It avoids much of the potential stigma and complexity of means-tested support, and gives people more confidence to plan their retirement finances and savings.

Another important point is that increasing the SPA may save money within the pension budget, but it can also move costs elsewhere on the Government's welfare bill. For example, those who are unable to keep working at ages below a rising SPA may need disability benefits, working-age support, health services, or help from family instead. From an inequality perspective, the impact of a higher SPA is, in practice, unlikely to fall evenly across the population. Indeed, it is the people who arguably need it the most – i.e., those already in poorer health and with shorter life expectancies – who may ultimately be the ones who lose the largest share of their expected years receiving the State Pension.

Why automatic formulas can mislead

Automatic adjustment mechanisms – i.e., objective rules that raise or lower the SPA whenever life expectancies change – can look tidy on paper and appear to remove subjective politics from difficult decisions. But life expectancy projections depend on assumptions about the future – including medical progress, public health, inequality, and economic conditions – and small changes in these assumptions can have large effects on outcomes many decades ahead.

Depending on its design, a formula could therefore produce results that look strange to the public, such as a falling pension age even while current mortality rates are improving, simply because assumptions about future improvements have been revised down. This would risk increasing controversy, especially as such topics may not be generally well understood, and there may be discomfort that those technical experts making the decisions driving these outcomes were not directly accountable to the public.

Life expectancy should therefore be an important input into decisions about the State Pension, but not the only one. A better approach would combine regular independent reviews, transparent evidence, scope for gradual change, and explicit consideration of how different socioeconomic and age groups are affected.

Generational fairness matters

Debates about SPA often focus on fairness between generations. This is important, since a smaller working-age population cannot indefinitely fund ever-rising retirement pension costs without consequences. But fairness within each such generation may be just as important.

People invariably reach their 60s with very different health, wealth, and work histories – some may have private pensions, savings, flexible jobs, and good health, whilst others may have little-to-no savings, be in physically demanding work or poor health, or have spent years caring for others. So, whilst a single SPA is simple and clear, it inevitably treats very different lives as if they were the same.

However, that does not necessarily mean there is a need to abandon a common SPA altogether. In fact, simplicity has real value in terms of ease of communication and understanding, as well as being easy and cheaper to administer. But it does suggest that any SPA increase should be accompanied by safeguards, such as stronger support for those:

- In ill health
- Unable to work
- Most reliant on state support.

For example, ideas that may be worth considering include:

- Earlier State Pension access on certified ill-health grounds
- A better-targeted Pension Credit system
- Clearer support for people in strenuous occupations or long-term caring roles.

The triple lock: protection or burden?

The cost of the State Pension is shaped not only by how many people receive it, and for how long, but also by how much it pays out. The UK's 'triple lock' policy – introduced by the Coalition Government in its first Budget after the 2010 General Election – has become central to this debate, promising that the UK State Pension will rise each year by the highest of price inflation, earnings growth, or 2.5% (House of Commons Library, 2023).

For pensioners, this has provided visible protection, especially during periods of high inflation or strong earnings growth. But over the long term, it also means that the State

Pension can rise faster than both wages and prices – for example, over sustained periods when both price inflation and earnings growth are below 2.5% p.a. The triple lock can therefore make future costs greater and hence intensify pressure to take action to reduce them now – for example, by raising the SPA.

The problem is that such an open-ended promise without a clear, long-term goal creates uncertainty. A more sustainable approach might be to decide upon the level of State Pension society wants to provide – for example, relative to typical earnings – and then maintain it in a predictable way that both protects against inflation erosion and avoids indefinite ratcheting upwards.

A long-life society needs a long-term plan

The real question is not whether the SPA should ever rise – indeed, in a society where people are living longer, some adjustment may be reasonable. Rather, the deeper point is how those decisions are made, communicated, and balanced against wider societal goals.

The Government should therefore be clear about what the State Pension is for – for example, is it:

- A basic income floor in old age
- A recognition and reward for economic and social contributions
- A tool for preventing poverty in old age
- A foundation for private saving and retirement planning
- Or some combination of all of these?

Without that clarity, debates about SPA risk becoming predominantly technical arguments about life expectancy and health in later life, while avoiding the more fundamental question of what kind of retirement and later-life society wants to collectively support.

Longer lives are a success story, reflecting medical progress, better living conditions, and the possibility of more time with family, work, learning, and community. But they also require public policies that are carefully designed to support longer, more varied lives. The State Pension should remain predictable and trusted, but it must also be affordable and fair, which in turn demands gradual change, honest communication, and a willingness to look beyond simple averages such as life expectancy to understand the real lives behind them.

References and further reading

House of Commons Library (2023). *State Pension triple lock: research briefing 7812*. <https://commonslibrary.parliament.uk/research-briefings/cbp-7812/> [Accessed 23 July 2026.]

Institute and Faculty of Actuaries (2025). *Third State Pension age review: independent review call for evidence: IFoA response*. <https://actuaries.org.uk/insight/policy-and-public-affairs/consultation-responses/consultation-responses-2025/> [Accessed Aug 3 2026.]

Institute and Faculty of Actuaries Pensions Board (2026). *An actuarial roadmap for better retirement outcomes*. <https://actuaries.org.uk/news-and-media-releases/news-articles/2026/jul/16-jul-26-foa-pensions-board-publish-new-report/> [Accessed July 23 2026.]

The Second Pensions Commission (2026). *Pensions 2050: evidence and future priorities: interim report*. <https://www.gov.uk/government/publications/pensions-2050-evidence-and-future-priorities-interim-report> [Accessed July 23 2026.]

United Kingdom Government, Department for Work & Pensions (2023). *State Pension age review 2023*. <https://www.gov.uk/government/collections/state-pension-age-review-2023> [Accessed 23 July 2026.]

United Kingdom Government, Department for Work & Pensions (2025). *Third State Pension age review*. <https://www.gov.uk/government/collections/third-state-pension-age-review> [Accessed 23 July 2026.]

United Kingdom Parliament (2014). *Pensions Act 2014*. <https://www.legislation.gov.uk/ukpga/2014/19/introduction/enacted> [Accessed 23 July 2026.]

Addressing the challenges of managing an ageing population

Institute and Faculty of Actuaries Ageing Populations Working Party

Why ageing populations need greater attention from policymakers

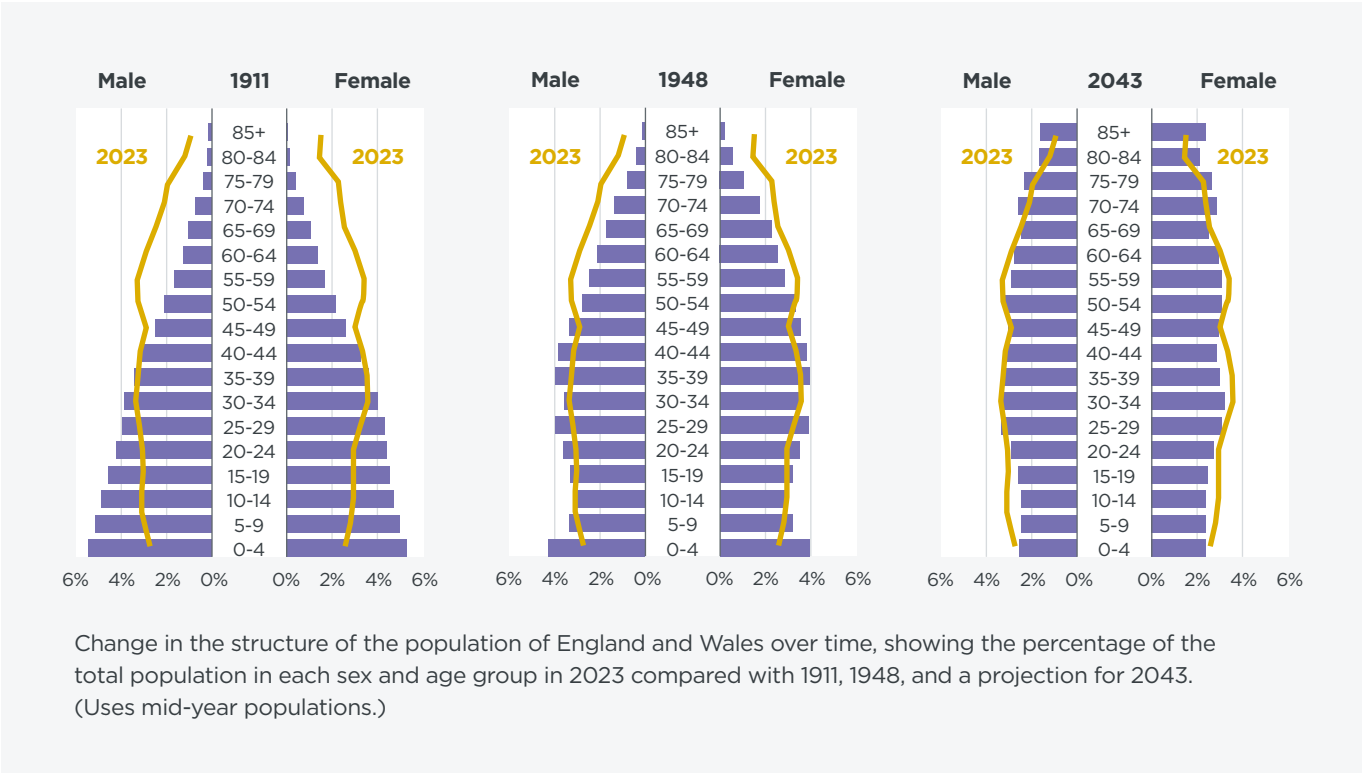
The demographic transition unfolding across the UK, and globally, represents one of the defining structural challenges of the 21st century. Falling fertility rates, increasing life expectancy, changing workforce participation, and mounting fiscal pressures are not only reshaping the economic and social landscape, but are also placing unprecedented pressure on pension systems, and on both the demand for and delivery of health and social care. *Figure 1* shows how the population profile of the UK has changed, and is projected to change, between 1911 and 2043.

Against this backdrop, the new Ageing Populations Working Party at the Institute and Faculty of Actuaries has been established to bring actuarial expertise, modelling capability, and long-term thinking to bear on one of the most important policy issues of our time.

Initially focused on the UK, the Working Party has global ambitions given that population ageing is not a uniquely British issue. Most developed economies, and an increasing number of developing ones, also face similar structural trends. Our intention is therefore to create a framework capable of supporting analyses not only of the UK’s demographic future (and its potential consequences) but, in time, to also carry out international comparisons of the varying degrees of population ageing, policy responses, and the impact of these policies.

The formation of the Working Party is both timely and necessary at such an important moment. In recent months, both the House of Lords Economic Affairs Committee (Parliament. House of Lords Economic Affairs Committee, 2025) and Second Pensions Commission (UK Government,

Figure 1: The changing age distribution of the population. (Source: UK Government. Department of Health and Social Care (2025), p. 19. © Crown Copyright, reproduced under the **Open Government Licence v3.0.**)



Department of Work and Pensions, 2026) have published reports relating to this critical and pressing topic.

The House of Lords report looked at how well we are preparing for an ageing society and highlighted the scale and urgency of the associated challenges facing the UK. The report’s key findings pointed to clear shortcomings in the policy response to demographic headwinds, concluding that the UK Government does not appear to be taking this issue seriously, as shown by its lack of meaningful solutions, and a track record of failing to treat the UK’s ageing society as a strategic priority. For example, the lack of a sustainable policy on funding for long-term social care is just one area where successive governments have refused to grasp the nettle. This is particularly concerning given that projections show that the old-age dependency ratio – i.e. the ratio of those in retirement to those of working age – is set to rise significantly over the coming decades (assuming no change in retirement patterns), as illustrated in *Figure 2*.

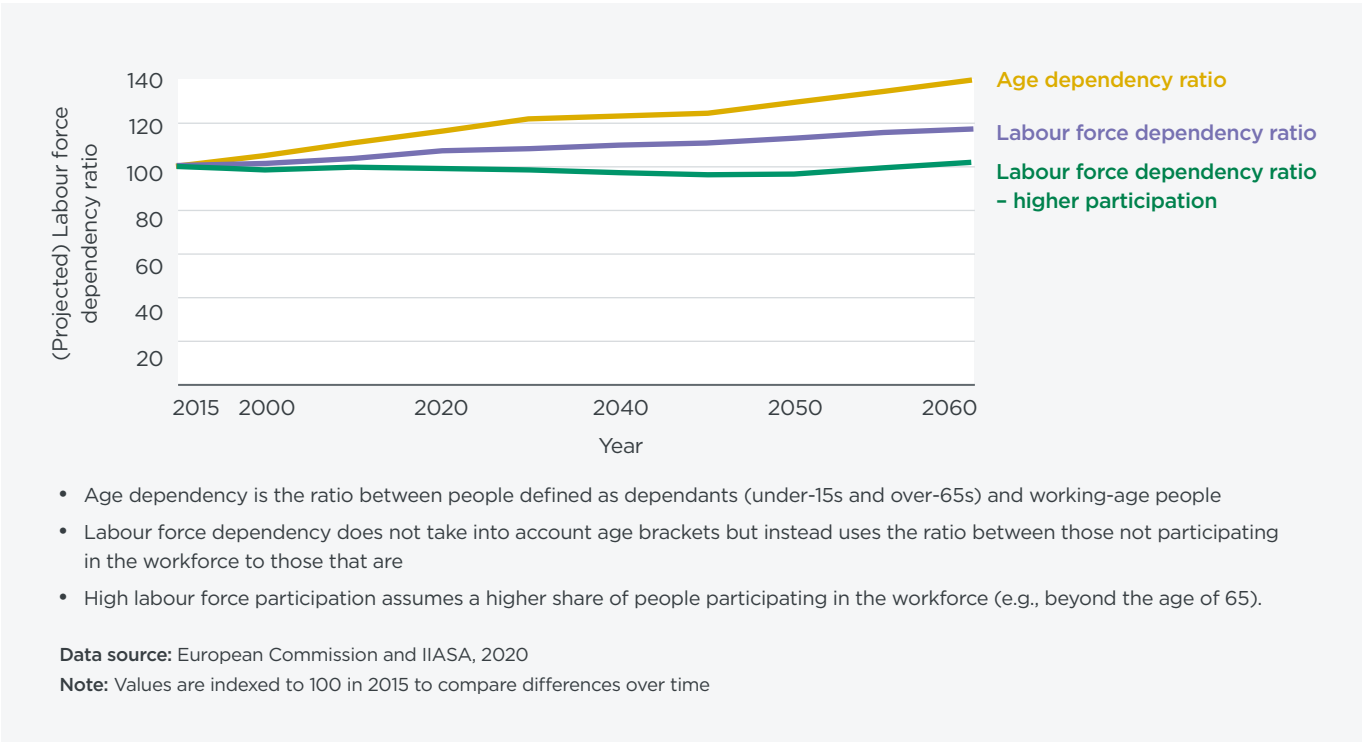
The House of Lords Economic Affairs Committee’s findings were stark. While increased longevity is in many ways to be celebrated, the combined effect of lower fertility, longer lifespans, and changing workforce participation is intensifying already growing pressures on state pension, healthcare, and social care systems. The report highlighted that simplistic responses, such as increasing the State Pension Age alone, are unlikely to solve the pension problem, particularly if many individuals leave the workforce well before State Pension Age, thereby further reducing

tax revenues and therefore the level of financial resources available to support state pension, health, and social care provision.

The report of the Second Pensions Commission, which is an interim report ahead of their final report due to be published in early 2027, concluded that the UK’s ageing population “requires a renewed and sustainable settlement for retirement adequacy”. This is because the Commission does not consider the current structure of state, employer, and private pension provision to be fit for purpose given the impact of the UK’s ageing population, slower economic growth, and changes in home ownership. The report also noted that “forecasts for fertility rates, life expectancy and net migration are also uncertain, so even faster ageing is possible”. Our modelling will explicitly consider this uncertainty. The timing of the Working Party’s analysis aligns well with the expected publication date of the Pensions Commission’s final report in early 2027, following which we will seek to further build upon their conclusions.

It is precisely in navigating these complex, interrelated dynamics that actuarial analysis can play a critical role and add significant value, providing an evidence base to assess trade-offs, quantify long-term effects, and inform more sustainable policy design. As the work of the Working Party progresses, we will also continue to investigate the value of developing more sophisticated modelling approaches, including microsimulation and the use of stochastic models.

Figure 2: Projected change in dependency ratio depending on labour force participation. (Source: Our World in Data (2026), reproduced under a **Creative Commons Attribution 4.0 International licence**.)



Initial work: building a flexible population modelling framework

The Working Party's first step to develop a robust population model has been the successful replication of the central population projections produced by the Office for National Statistics (ONS, 2022). At first glance this may sound straightforward, but it represents a substantial technical achievement; by reconstructing the underlying demographic engine – including fertility, mortality, and migration assumptions – the Working Party has created a modelling framework that provides a credible foundation upon which more sophisticated scenario analyses and policy-relevant insights can be built.

Importantly, our model is not limited to simply reproducing official forecasts. Because the underlying data and modelling functionality are now established, it can also be used to interrogate the assumptions themselves, constructing bespoke scenarios to investigate how small changes in demographic drivers can produce very different long-term outcomes. This capability enables a far more nuanced and dynamic assessment of possible future population trajectories.

Users can explore, by age and sex:

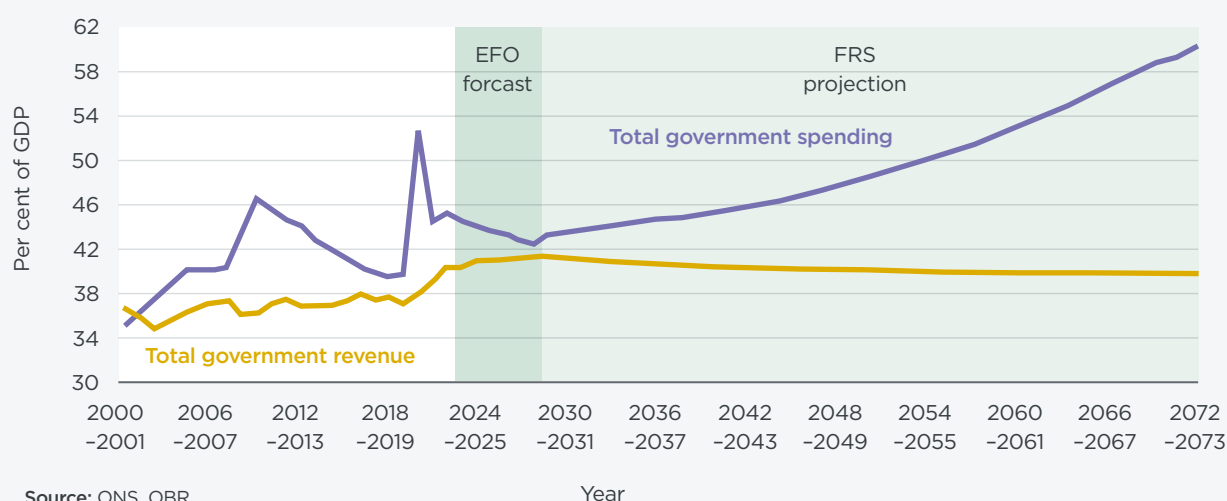
- Alternative fertility trajectories
- Differing migration assumptions
- Varying improvements in life expectancy
- Or combinations of all the above.

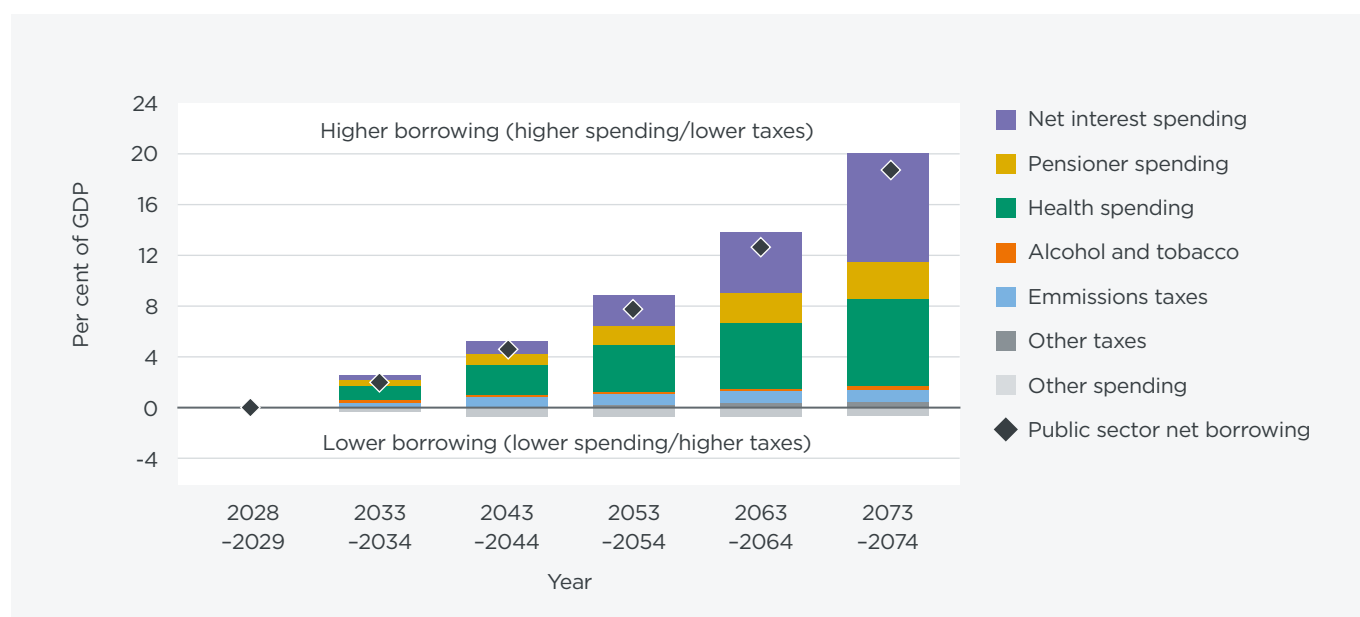
This flexibility is particularly valuable because demographic change typically unfolds gradually, often masking the true scale of its eventual consequences (Miles, 2025). Pressures arising from ageing populations accumulate slowly, but the long-term, cumulative implications can become profound if insufficient attention is paid early enough, and action is delayed. However, there are, of course, no guarantees that any specific actions taken will change longer term population trajectories, particularly if these are driven by (for example) changing societal preferences regarding migration and family size.

Future work: from demographics to economic sustainability

The Working Party's ambition extends well beyond population projections alone, and the next stage of our model development will focus on integrating demographic projections with fiscal sustainability, both public and private pension systems, health and social care demand, and labour-market projections. This reflects a key conclusion from the House of Lords' Economic Affairs Committee's report that population ageing is not merely a demographic phenomenon, but fundamentally an economic and societal challenge. Specifically, the report highlighted concerns that, without substantial improvements in productivity or workforce participation, the UK could face increasing fiscal strain driven by a shrinking working-age population supporting a growing retired population, as illustrated by the projections from the Office for Budget Responsibility shown in *Figure 3*.

Figure 3: Projected total government revenue and spending (below), and projected decomposition of change in borrowing (following page). (Source: Office for Budget Responsibility (2024), pp. 13, 25. © Crown Copyright, reproduced under the Open Government Licence v3.0.)





We also intend to use our model to review the demographic situation and potential futures in other countries, following a similar approach to our UK work, namely by replicating existing official population projections and then applying different demographic assumptions to project various possible alternative future outcomes.

Exploring future outcomes through stress testing

A particularly important aspect of the Working Party's approach is its emphasis on both stress testing – i.e., changing one assumption at a time – and scenario analysis – i.e., changing multiple assumptions all at once. Rather than producing a single forecast, the intention is to build a flexible environment within which assumptions can be adjusted dynamically, and data updated regularly to both reflect emerging experience and explore resilience under different possible future states. This capability matters because demographic change interacts with many other structural trends, including the impacts of climate change, artificial intelligence, housing, healthcare, and intergenerational inequality.

The Working Party's scenario framework is designed specifically to allow interrogation of the dynamics described in the previous section, and to enable detailed exploration of how different trajectories of demographic change, labour supply, economic growth, and longevity interact.

One potential candidate scenario developed by the Working Party – the 'Pre-Retirement Participation Squeeze' – examines what might happen if labour market exits amongst people aged 50 to 64 continue to occur well before State Pension age, whether driven by ill health,

caring responsibilities, currently limited opportunities due to age discrimination, or otherwise. This is a particularly important issue because traditional policy narratives often assume that increasing State Pension age(s) will materially improve fiscal sustainability. However, evidence suggests that many individuals are already economically inactive well before reaching State Pension age (ONS, 2026), calling into question the effectiveness of pension-age policy in isolation, and reinforcing the need for a more holistic approach to workforce participation and healthy ageing.

The scenario could therefore be used to explore questions such as:

- How sensitive are public finances to workforce participation at ages 50 to 64?
- What happens if workforce participation at older ages fails to improve alongside overall longevity?
- How quickly do pension adequacy and poverty risks escalate under weaker workforce dynamics?
- Which policy interventions might meaningfully improve long-term sustainability, focusing on areas that can be shown to have the greatest potential for positive impact, or relative ease of implementation?

The ability to analyse several interconnected demographic and economic risks, such as those we have discussed, is where actuarial skillsets become especially powerful. Actuaries are trained to think probabilistically and critically, to rigorously assess long-term uncertainty, and to understand how complex, interdependent systems evolve over decades rather than across short-term cycles. This perspective is critical in evaluating the cumulative effects of demographic, economic, and societal health trends.

But simply doing a lot of technical work will not be enough: we need to proactively engage with policymakers at all levels, and this will be one of the objectives of the Working Party.

A major opportunity for the actuarial profession

Longevity, ageing, and intergenerational sustainability remain markedly under-represented in mainstream public discussion, relative to their significance. However, these issues align directly with the core strengths of the actuarial profession. Actuaries already play a central role across pensions, insurance, investment, and risk management, and the issue of population ageing cuts across all these domains simultaneously. The actuarial profession therefore has a clear opportunity, and arguably a responsibility, to contribute more visibly to evidence-based policymaking in this space. The Working Party aims to help establish and support that platform, and actively participate in any associated engagement with policymakers.

By bringing together demographic modelling, scenario analysis, and long-term fiscal thinking, the Working Party hopes to support a more informed, joined-up public debate on how societies adapt to longer lives and changing population structures.

Importantly, the framing of this debate should not be unduly negative. Indeed, increased longevity arguably represents one of humanity's great achievements. The real challenge, however, lies in ensuring that institutions, labour markets, pension and healthcare systems, as well as public finances, respond and evolve in ways that support people living longer, healthier lives. One view of a more optimistic future that could achieve these aims is explored by Tanya Singh **elsewhere** in this *Bulletin*.

Ultimately, the crucial question is therefore not whether ageing populations will reshape societies. Indeed, they are already doing so. Rather, the more pressing issue is whether governments, businesses, and institutions can respond early enough, and with sufficient intelligence and foresight, to enable us all to adapt successfully to this structural shift. As in many areas of policy, whilst there will inevitably be the need for trade-offs and compromises, the Working Party nevertheless hopes that it will be able to make a fruitful contribution to the necessary society-wide discussions on this topic over the coming years.

Looking ahead: plans for Working Party efforts

The Working Party's first full report is scheduled to be launched via webinar in early September 2026, and this will set out our initial modelling framework, findings, and priorities for development. Future work is expected to

enhance the sophistication of our scenario modelling, strengthen the links to fiscal and pension sustainability analyses, and expand the framework's global applicability.

The demographic transition already underway will shape economic and societal outcomes for decades to come. It deserves significantly greater attention in public and policy debate, and the actuarial profession – supported by the Working Party – is well positioned to help society anticipate, prepare for, and navigate this aspect of the future.

References

Miles, A. (2025). Age old problem: how ageing is transforming societies. *The Actuary*, Nov. <https://www.theactuary.com/2025/11/05/age-old-problem-how-ageing-transforming-societies> [Accessed 10 July 2026.]

Office for Budget Responsibility (2024). *Fiscal risks and sustainability* (CP 1142). https://obr.uk/docs/dlm_uploads/Fiscal-risks-and-sustainability-report-September-2024-1.pdf [Accessed 10 July 2026.]

Office for National Statistics (ONS) (2022). *Population projections*. <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections> [Accessed 10 July 2026.]

Office for National Statistics (ONS) (2026). *Annual Population Survey, April 2025 - March 2026*. <http://doi.org/10.5255/UKDA-SN-9587-1>

Our World in Data (2026) *Projected change in dependency ratio depending on labor force participation, United Kingdom*. <https://ourworldindata.org/grapher/projected-change-dependency-ratios> [Accessed 10 July 2026.]

Parliament. House of Lords Economic Affairs Committee (2025). *Preparing for an ageing society*. (2nd report for session 2024–26). <https://publications.parliament.uk/pa/ld5901/ldselect/ldeconaf/236/236.pdf> [Accessed 9 July 2026.]

UK Government. Department of Health and Social Care (2025). *Health trends and variation in England, 2025: a Chief Medical Officer report*. <https://www.gov.uk/government/publications/health-trends-and-variation-in-england-2025-a-chief-medical-officer-report> [Accessed 10 July 2026.]

UK Government. Department of Work and Pensions (2026). *Pensions 2050: evidence and future priorities – interim report*. <https://www.gov.uk/government/publications/pensions-2050-evidence-and-future-priorities-interim-report> [Accessed 9 July 2026.]

The Ageing Populations Working Party

The IFoA's Ageing Populations Working Party is a platform for actuaries across the globe to share insights, research, and best practices in this area. Through collaborative exploration, it seeks to identify actionable strategies and solutions for mitigating risks and enhancing opportunities arising from demographic changes. As of July 2026, members of the Working Party are Alexandra Miles (Chair), Rebecca Hann (Deputy Chair), Dermot Grenham, Clodagh Howe, Beth Hundleby, Christine Fairall, and Joseph Jackson.

News from the Continuous Mortality Investigation (CMI)

Introduction

The CMI's recent activity has continued to focus on our regular analyses of mortality and morbidity experience, alongside a comprehensive review of the CMI Model, to improve alignment with recent data across different age ranges both during and after the pandemic. The CMI has also carried out several surveys to gather insights from subscribers, with the aim of increasing the value of the CMI's outputs. This article outlines the following:

- The release of the latest CMI Mortality Projections Model, CMI_2025
- The Mortality Projection Committee (MPC)'s annual research paper and CMI Model benchmarking survey
- An update on recent mortality in the general population of England and Wales
- An analysis of bulk annuities by the Annuities Committee in collaboration with the Self-Administered Pension Schemes (SAPS) Committee
- The Income Protection (IP) Committee's claims management survey
- Regular experience analyses of pensioners, pension annuities in payment, term assurances, and income protection.

CMI_2025

The MPC published the latest version of the CMI Mortality Projections Model, CMI_2025, in March 2026, alongside **Working Paper 211** and other related outputs.

CMI_2025 follows a business-as-usual approach, making a routine annual update to the calibration data but without changing any modelling methods. This follows a more substantial update for the previous version of the Model, CMI_2024.

CMI_2025 produces cohort life expectancies at age 65 that are about eight weeks higher for males and about six weeks higher for females than those from CMI_2024. This increase in life expectancy reflects the relatively low levels of mortality observed during 2025, with an all-age improvement of 2% compared to 2024.

We previously indicated that we were considering three aspects of the Model in more detail:

- The approach for population estimates in the final year of the calibration dataset
- Convergence periods to the long-term rate of improvement at the oldest ages
- The run-off pattern for the default pandemic overlay at younger ages.

While the MPC's review did not lead to any changes in method for the Core version of CMI_2025, they are not ruling out the possibility of such changes in future versions of the Model. The MPC acknowledges the challenges in these areas, and the value of further exploring alternative approaches, and are carrying out a broader review of the projection aspects of their methods following the release of CMI_2025.

The MPC notes that users can adapt the Model to reflect their own views on these subjective points, and included a summary of their analysis in the Appendices of Working Paper 211 to help inform users' decisions.

MPC annual research paper

The MPC published its annual research paper (formerly known as the 'interim update') as **Working Paper 208** in December 2025.

The paper contains the following, which are intended to be helpful to users of the CMI Model:

- A summary of the MPC's activities during 2025
- Analysis of recent mortality and mortality improvements for the general population and in the CMI datasets
- Analysis of mortality in twelve territories using the new flexible overlay added to CMI_2024 in October 2025.

CMI Model benchmarking survey

The MPC issued its annual benchmarking survey in April 2026, and was pleased to receive 25 responses. Analysis of the responses was published in **Working Paper 213** during July 2026:

- CMI_2024 was the most commonly used Model version at 31 December 2025
- Of those respondents who indicated a likely Model version for use at 31 December 2026, 60% indicated CMI_2025, with around 25% intending to use CMI_2024, and no respondents expecting to use CMI_2020 or earlier versions
- Respondents were asked to provide an indication of their best estimate view of the specific impact of the pandemic on life expectancy. When looking at liability-weighted results, the vast majority of respondents indicated that the pandemic has resulted in a fall in life expectancy. The liability-weighted average impact on life expectancy at age 65 was a 1.1% reduction compared with their pre-pandemic expectations
- The paper also contains information on the Model parameters used, life expectancies, and differences between both insurers and reinsurers, and between longevity and mortality protection books of business.

Mortality monitor

The MPC continues to produce detailed quarterly and summary monthly updates (every four or five weeks) to the **CMI mortality monitor**.

The latest summary monitor for week 26 of 2026 covers data to 26 June 2026, and was published on 8 July 2026. As illustrated in *Figure 1*, overall mortality rates during the first 26 weeks of 2026 were lower than in the corresponding period in any other year.

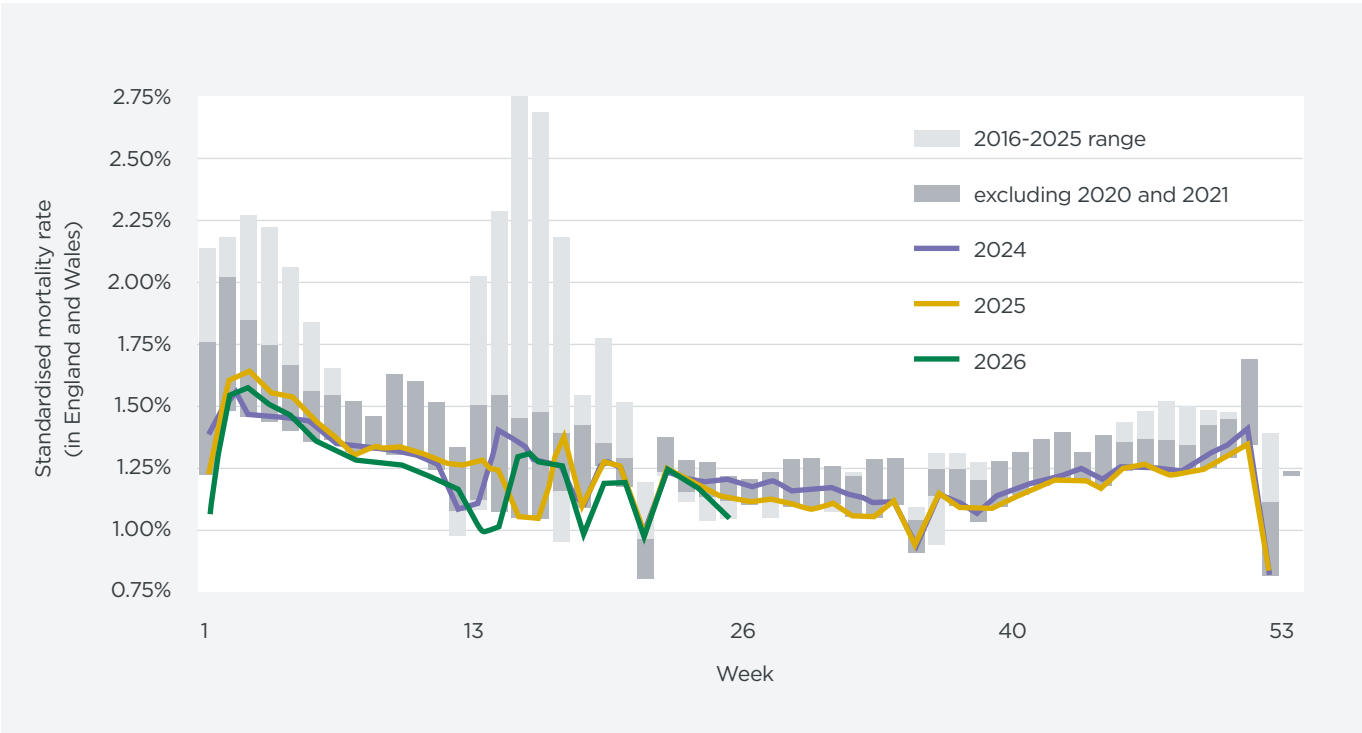
Mortality experience of pensioners

The SAPS Committee published **Working Paper 209** in January 2026. The paper investigates the mortality experience of pensioners over the period from 2017 to 2024.

The analysis shows that:

- For most subsets of the data, the mortality rates experienced by both pensioners and dependants are very close to the unprojected ‘S4’ Series tables, noting that the dataset underlying this paper includes data for 2020 to 2024, whereas the ‘S4’ series tables do not
- Despite year-on-year volatility, mortality tended to become lighter over the period to 2019, but was heavier in 2020 before becoming lighter over the period to 2024. The improvement in experience from 2020 to 2024 is clearest for male pensioners, and least clear for female pensioners

Figure 1: Weekly standardised mortality rates in England and Wales for 2024, 2025, and 2026, relative to the 2016-2025 range (both with and without 2020-2021).



- Observed mortality rates were generally lower in higher pension amount bands, with differentials between the bands reducing at higher ages
- Mortality experience of the 'IMD dataset' continues to be heavier than the experience of the 'total dataset'
- The increase in mortality between 2019 and 2020, and between 2019 and 2021, appears to be lower for the SAPS dataset than in the general population.

Efficacy of the 'S4' Series socioeconomic mortality tables

The SAPS Committee published **Working Paper 205** in September 2025. The paper presents the results of an analysis into the efficacy of the 'S4' Series socioeconomic mortality tables, which is the first analysis of its kind from the SAPS Committee.

To assess the efficacy of various 'S4' Series mortality tables, they calculated experience using $100 \times \text{actual/expected}$ ($100 \times A/E$) with three different measures for the expected deaths:

- 'All', using the 'all-amounts' (i.e., S4PMA, S4PFA, or S4DFA) tables for all members
- 'Amount banded', using the appropriate amount band table for a member's pension amount (e.g., S4PMA_H)
- 'IMD', using the appropriate Index of Multiple Deprivation ('IMD') table for a member's pension amount and IMD decile (e.g., S4PMA_G1).

When considering each pensioner type in turn, they observed that:

- For male pensioners, both the 'Amount banded' and 'IMD' table measures are better predictors of actual mortality than the 'All' measure – *Figure 2* shows the experience for data submissions with 1,000+ years of lives-weighted exposure on the three measures of expected deaths
- The results are less clear for female pensioners, although there is still some evidence that assigning members to the relevant socioeconomic 'IMD' table improves the predictive performance of the tables
- For female dependants, there are no 'Heavy' or 'Middle' amount banded tables, and hence modelling limitations for the 'Amount banded' measure. The 'IMD' tables measure appears to provide a slightly better fit to actual experience than assigning all individuals to S4DFA.

Bulk annuities experience

The Annuities Committee published **Working Paper 210** in March 2026. This paper compares mortality tables and mortality experience for bulk annuities (collected by the Annuities Committee) and private sector pension schemes (collected by the SAPS Committee) during 2016-2023.

The analysis shows that:

- The '16' Series pension buy-out mortality tables are lighter than the 'S4' Series Pensioner mortality tables, but heavier than the 'S4' Series Dependant mortality tables

Figure 2: $100 \times \text{actual/expected}$ deaths for male pensioners within data submissions with 1,000+ years of lives-weighted exposure, on each of the 'All', 'Amount banded', and 'IMD' table measures.



- For both males and females, mortality experience of the Bulk annuity dataset is similar to the SAPS dataset on a lives-weighted basis. On an amounts-weighted basis, experience of the Bulk annuity dataset is slightly lighter than the SAPS dataset
- In both the Bulk annuity and SAPS aggregate datasets, male mortality experience relative to the 'S4' Series Pensioner amount band tables is fairly flat, suggesting these tables incorporate differentials in experience for individuals with different pension amounts well. Similar comments also apply for male experience relative to the 'S4' Pensioner IMD tables, suggesting that these tables incorporate differentials by socioeconomic group well
- For females in both the Bulk annuity and SAPS datasets, some variation by amount band is seen relative to the 'S4' Series Pensioner amount band tables, suggesting that these tables do not fully allow for differentials in experience for females by pension amount. Similar variation is again noted for female experience relative to the 'S4' Pensioner IMD tables. This variation and the difference in performance of the tables for males compared to females may be linked to the mix of pensioner and dependant data in the female datasets, since there is a higher proportion of dependant second life pensioners in the female data.

Pension annuities experience

The annual analysis of pension annuities in payment data, to end 2024, is currently being produced. The analysis will include both updates on experience of the dataset to 2024, and illustrative graduations based on the latest data (using data from 2022-2024). The Annuities Committee is also analysing equity release mortgages data to end 2024, to update their previous analysis from **Working Paper 164**.

Assurances Committee

The Assurances Committee is currently producing an analysis of experience data for 2022-2024, using new data for 2024. The analysis will include results for both rated and standard term assurances for the first time, following the success of their previous analysis of rated lives published in **Working Paper 207** during November 2025.

The Committee plans to follow up on this analysis with a standalone analysis of causes of death amongst mortality term assurance holders, including comparisons to general population causes of death, to assess the effectiveness of underwriting on certain causes.

Another major focus of the Committee is a thorough review of its methodologies in preparation for producing its next set of standard tables. This work will include a comprehensive assessment of graduation and multivariate analysis techniques. To complement this, the Committee is

also planning a qualitative review of notable changes in term assurance underwriting and product evolution that could influence data selection for the new tables, and provide additional insights on claims experience. To facilitate this, the Committee will be arranging a roundtable discussion under Chatham House rules for interested subscribers in the Autumn.

Income Protection Committee

Data collection is currently underway for IP data to end 2024. Once all of this data has been received, then the IP Committee's regular experience analysis will be produced.

The Committee also recently issued a survey to gather information in respect of approaches to claims management for individual IP business and has started analysing responses, with the expectation that a couple more may still be received. The survey included questions covering the following aspects relating to claims management:

- Claims management during the deferred period
- Claims assessment and processing
- Ongoing claims and case management
- Return-to-work strategies
- Challenges and changes in this space.

The Committee has been pleased with the levels of engagement with the survey, and is considering hosting a roundtable discussion for subscribers on claims management approaches later in the year, if there is sufficient appetite.



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