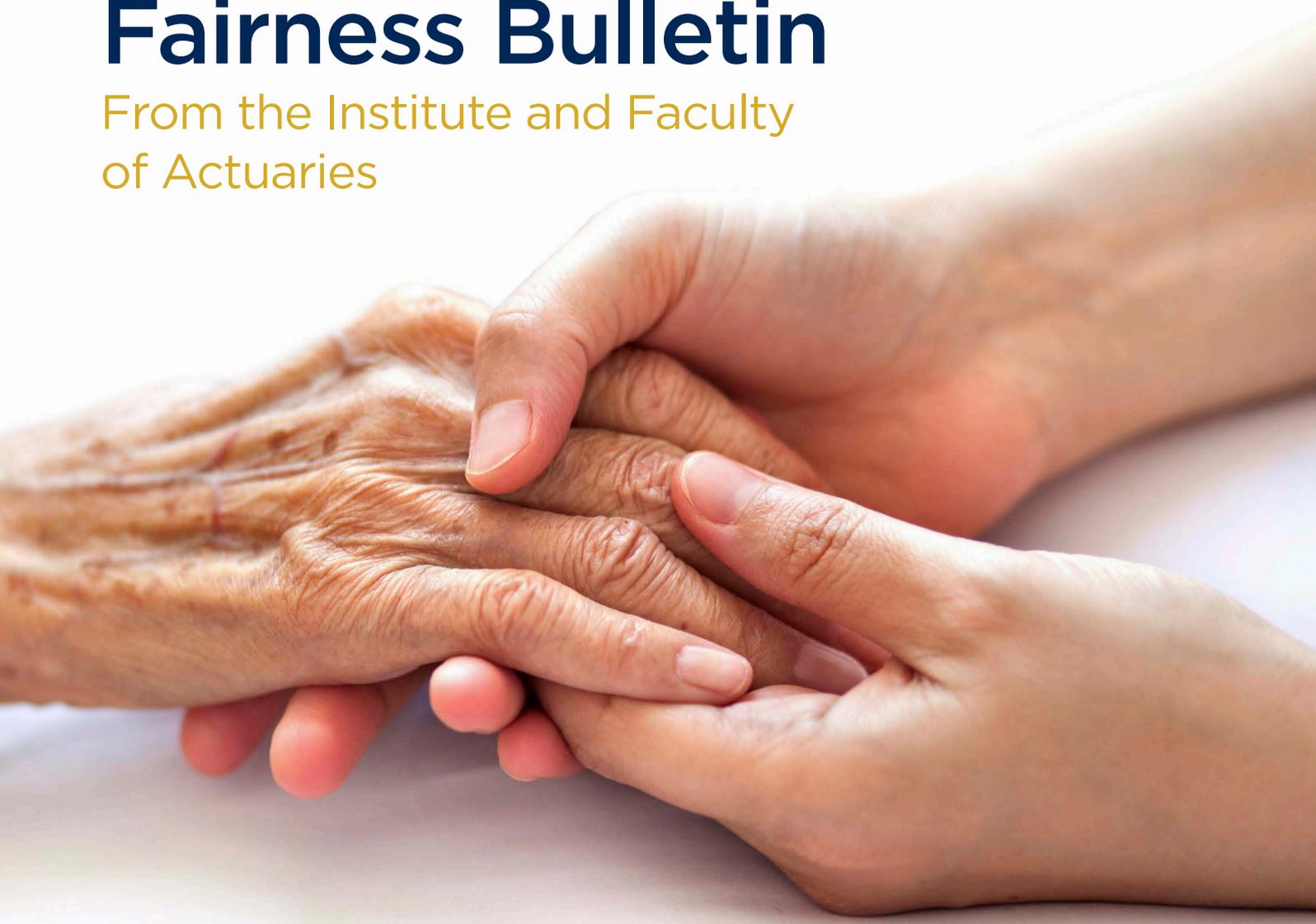




Institute
and Faculty
of Actuaries

Intergenerational Fairness Bulletin

From the Institute and Faculty
of Actuaries



Health and care

Ageing
population

Informing the debate

October 2017

Issue 3

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Introduction by our Immediate Past President

The third and final instalment of our Intergenerational Fairness series looks at the many ways in which issues of health and social care can be seen through an intergenerational lens. Health, longevity and morbidity are long-held concerns of actuaries. We've brought together a range of experts to examine how the growing proportion of older people in our demography, and the increased chances of these older people living to advanced ages with multiple health and care needs, will have implications for younger and future generations.

In 2016 the House of Lords established a committee to examine the long-term sustainability of the NHS and adult social care services in the UK. Its central question represented the crux of the intergenerational fairness issue: can the current health system be sustained, to see the current older generation and baby boomers through the rest of their lives in comfort and dignity, without collapsing under the weight of increased pressure? Or as one of our contributors more succinctly puts it, 'can healthcare survive the Baby Boomers?'

We know the growing proportion of older people, as the so called Baby Boomers age, is likely to place a strain on the public purse, and on younger generations by extension, as the various facets of the health service attempt to adapt to our extended lives, more of which are likely to be experienced in poor health. Tricky questions around who can and should pay to fund this increasing demand extend far beyond the tax and spending plans of the Treasury, and become all the more controversial when we consider social care.

In campaigning for the 2017 General Election, the Conservative Party manifesto made frequent reference to the concept of intergenerational fairness, and positioned social care funding as a key policy area through which to reset the intergenerational balance. Critics of this policy found themselves reiterating a counterargument we have encountered so frequently throughout this series: that the quest for intergenerational equity cannot ignore a number of key intra-generational factors.

Many have pointed out that the way the social care system interacts with the NHS will be key to the sustainability of both. Indeed the aforementioned Lords Committee concluded that



the UK health service is ultimately sustainable, but a culture of short-termism prevents decision makers from looking beyond the day-to-day to plan for the future. The stability and sustainability of the self-funded social care system will help to define how the cost of funding this increase in need for social care is spread across the individual and the state, and balancing of costs between older and younger generations.

This concept, along with a number of other health issues are explored in more depth in the articles that follow. We hope you enjoy reading.



Colin Wilson
Immediate Past President
Institute and Faculty of Actuaries

If you would like to find out more about our work on intergenerational fairness or health and care, please email: policy@actuaries.org.uk.

2. Can healthcare survive the Baby Boomers?

Angus Hanton, Co-founder, Intergenerational Foundation

The percentage of people over 65 years in OECD countries is estimated to increase from 16% now to over 25% by 2050. This will have wide-reaching implications for healthcare expenditure both today and in the future. The question is: can our healthcare systems survive the baby boomers?

Since 1970 total healthcare spending has risen across the developed world, with OECD average public and private spending on healthcare increasing from under 5% of GDP to over 10% by 2014.

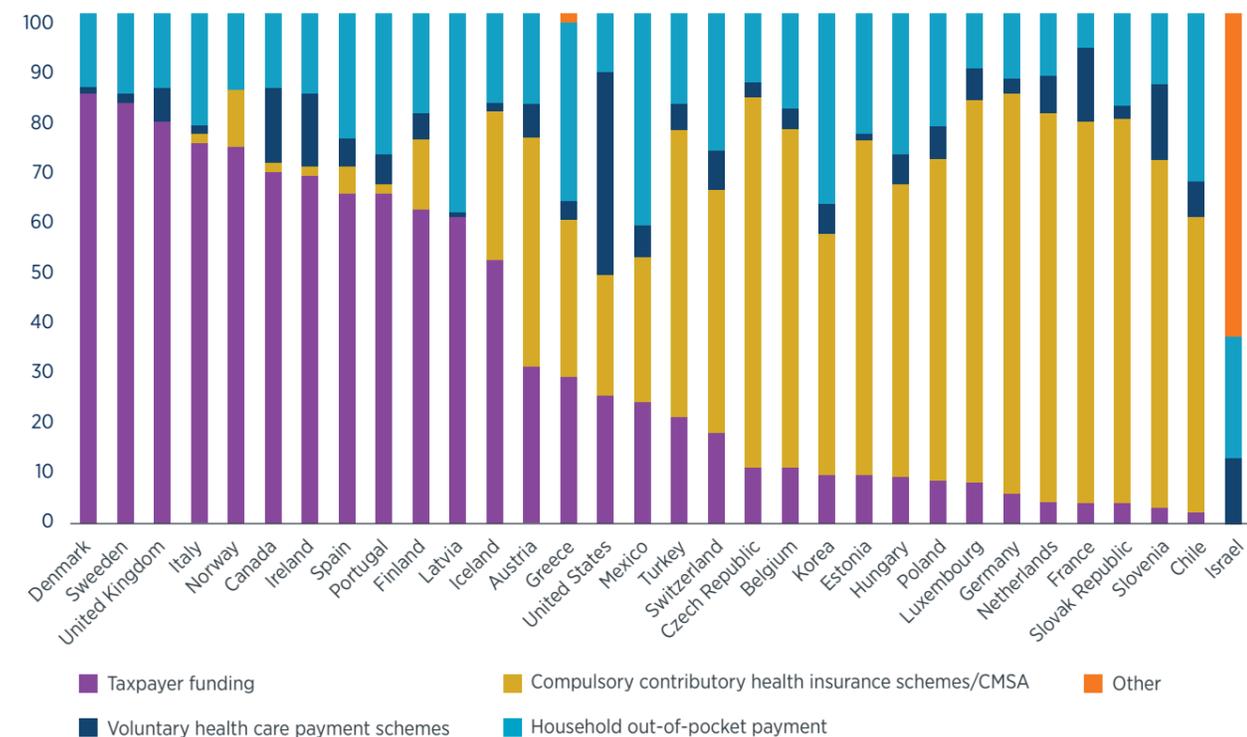
The UK already has the third highest-costing taxpayer-funded healthcare systems in the OECD, with 80% of healthcare spending coming from government via general taxation (Figure 1).

Ageing, Technology and AMR

Research by Kelly et al. (2015), which looked at individual patient records within the English NHS, found that both an individual's likelihood of using public hospitals within a given year and the cost of treating them both rise rapidly with age. They found that medical spending starts to escalate after the age of 50 for both sexes – the average cost of treating an 89 year-old man in hospital during a given year is three times higher than for a 70 year-old and nine times higher than for a 50 year-old.

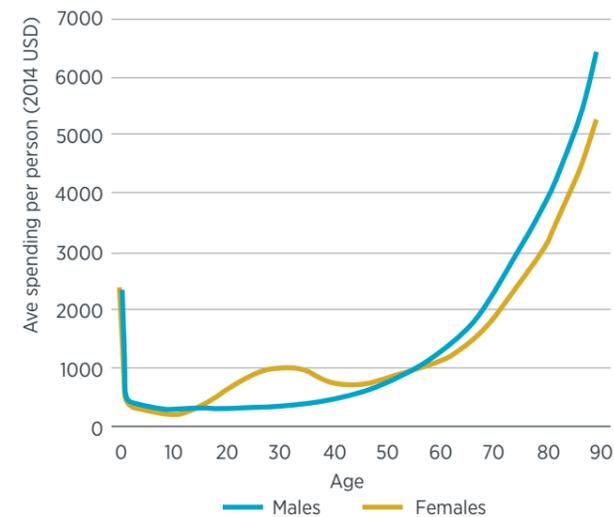
Technological progress is cited by both Newhouse (1992) and Cutler (1995) as another driver of increasing healthcare costs.

Figure 1. Percentage of total healthcare expenditure by source across OECD countries, 2014



Dem source: OECD

Figure 2. Average hospital spending by age and gender (2010/11 – 2014/15)



Source: Institute for Fiscal Studies

Improved technology means medicine can do more for more people at older ages, such as undergoing second and even third hip replacements.

With more people living longer and receiving more treatment, more episodes of care are likely to be delivered, involving more staff. That, combined with improving medical knowledge, and the increasing complexity of comorbid age-related conditions, is likely to increase healthcare expenditure further.

A potential additional driver of increasing healthcare costs is the over-use of antibiotics leading to a “slow-motion tsunami”, according to Margaret Chan, former World Health Organization Director-General. Antimicrobial resistance (AMR) is now one of the main threats to the UK, alongside terrorism and pandemic flu, according to Sally Davies, England’s chief medical officer.

While death (at any age) still appears to be a more significant driver of increased hospital expenditure than ageing per se (Aragon et al 2015), by looking at NHS activity over a given period by the ages of patients, it is possible to build up a picture of health service usage. Patients who are over the age of 60 now account for almost half of all NHS hospital activity, compared with 38% in the late 1990s. Patients who are over 75 now account for a quarter of all NHS hospital activity, compared with less than a fifth in the late 1990s.

And as for social care funding? Public spending cutbacks since 2010 have significantly reduced capacity in the adult social sector, piling increased demand onto the NHS as practitioners face delays in discharging frail elderly patients. This consumes 2.7 million hospital bed days per year and costs £820 million in lost productivity (National Audit Office, 2016).

Choices

Hard choices have to be made, as Kate Barker, in the final Barker Commission report, stated:

“The fact that we are living longer is not going to overwhelm us. But there are some intense short-term pressures to be dealt with and some hard long-term and unavoidable choices ahead... health and social care will have to be cut back, taxes will have to rise, or those receiving care will have to pay more.”

In early 2017 the Office of Budget Responsibility (OBR) stated that the NHS’s budget would need to increase by £88bn over the next 50 years to keep pace with the rising demand for healthcare and could threaten to render public finances “unsustainable”.

With the objective of spending more on healthcare, political rhetoric has tended to coalesce around the need to reduce other areas of spending, which has often meant reducing welfare spending on the young. Increasing taxation either through income tax or via National Insurance would also result in the working-age population once again paying a disproportionate amount.

Who Should Pay?

The Millennial generation already is struggling from falling wages (ONS 2017). Graduates leaving university now face a 41% marginal tax rate on earnings over £21,000 thanks to 9% student loan repayments, 12% national insurance, and 20% income tax, before 2% NEST deductions, and high housing and living costs.

Meanwhile, the incomes of the retired population are higher than those of the working population for the first time (IFS 2015), and the over-65s continue to enjoy universal welfare protection such as winter fuel payments, free prescriptions, National Insurance exemptions, and free travel on top of housing wealth, overgenerous final salary pensions, and the continuation of the Triple Lock on the State Pension.

It seems only intergenerationally fair that those who are likely to use the service the most – older people – who also have a larger proportion of the national wealth – should bear more of the cost of increased healthcare funding.

In order to find the extra money required, a more intergenerationally equitable settlement could be achieved if the over-65s still working paid the same rate of National Insurance as younger generations which could raise an extra £2 billion each year; winter fuel payments were removed releasing £2.7 billion p.a., and if free prescriptions were aligned with the State Pension Age releasing £1.6 billion annually (Intergenerational Foundation 2013). Reform the 40% tax-free pension relief allowance as well and we would be moving closer to an intergenerationally equitable funding model for healthcare services for the future.

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3. Work and health in later life

Patrick Thomson, Senior Programme Manager, Centre for Ageing Better

Our workforce, like the population at large, is ageing. This is dramatically changing the structure of our workforce, as we have more clients, colleagues and customers in older age brackets. 14% of workplaces already have the majority of their employees aged over 50. With demographic trends continuing, and a projected gap in the number of younger workers entering the job market, these numbers will continue to rise.

Employment in later life can be hugely beneficial to both employees and employers alike. For the individual, work is important financially, but is also a major source of social connections. It can give a sense of purpose, and keep people physically and mentally active. But the key here is that this work needs to be fulfilling and suit the needs of the individual.

For employers, the business case for recruiting and retaining older workers is clear. Failure to do so will mean that employers may soon face labour supply shortages. Evidence shows that retaining people aged 50 and over in employment does not mean fewer jobs for young people. It also looks increasingly unlikely that we will be able to fill this gap with migrant workers in the future.

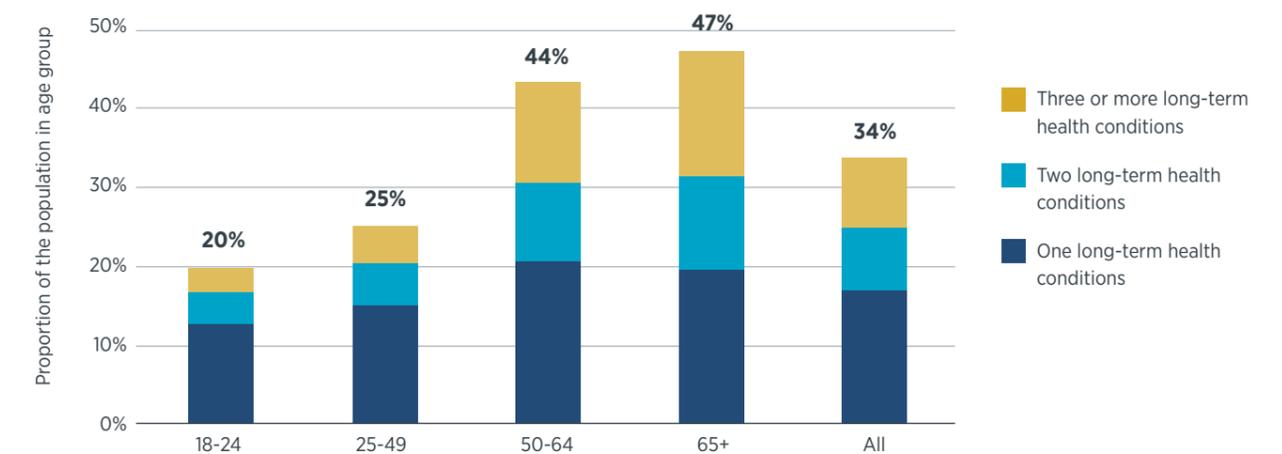
The problem

Our report, **Fulfilling work: what do older workers value about work and why?** highlighted that older workers want the same things from employment as their younger counterparts. If workers of all ages want to be able to make a meaningful contribution to an interesting role, which provides them with social interactions, the opportunity to learn and progress, and be able to contribute their ideas and experience, why isn't this happening?

One of the main differences between older and younger workers is that people aged 50 and over are more likely to suffer from health conditions, with 44% of people aged 55-64 having at least one long-term condition.

Currently, less than half of people are still in work the year before they reach State Pension age, and ill health is the single biggest factor that pushes older workers out. Without flexible or preventive measures in place, it becomes increasingly likely that this group of people will continue to be pushed out.

Chart 5.2: Proportion of people with long term health conditions, by the age and number of conditions



Currently, less than half of people are still in work the year before they reach State Pension age, and ill health is the single biggest factor that pushes older workers out.

In many cases the type of work people are doing can be a factor in either causing or worsening health conditions. For example, for those who work in the construction sector, ill health is the major reason that men aged 50-64 leave work – greater than that of redundancy and retirement combined.

What needs to be done?

While poor health isn't inevitable as we age, there is an increase in the rates of long term health conditions with age. Almost half of the UK's 3.7 million disabled people not in work are aged 50-64. Most disabled people aged 16-49 are in work, while most disabled people aged 50-64 are not.

Employers need to ensure that they are addressing the requirements of their employees, offering access to flexible working arrangements and taking preventive action to support good health in the workplace. Regular workplace assessments must become common place, and not just in order to tick a box.

Employees themselves also have a role to play. Many of us are inclined to believe that aches and pains are just a part of getting older. This stereotype of 'inevitable decline' with age contributes to both employers and employees failing to take early action. And although many slow-onset conditions, such as musculoskeletal conditions, are more common as we age, being aware of them and discussing any problems with employers provides an opportunity to identify deterioration early on and take preventive action.

Making use of the opportunities that arise from an ageing workforce, by providing more support and flexibility, makes for a happier, healthier and more productive workforce. It also allows older workers to share skills and experience with their younger colleagues. It has been shown that organisations who effectively manage mixed-age teams have staff who work well together towards common goals and form strong bonds with each other.

Although many employers now understand the need to support their older workers, there is still a lack of evidence-based guidance on how to do this. We are currently carrying out **employer-focused research** to better understand how we can make workplaces more age-friendly – one strand of which is improving the way that multi-generational workforces work together. We want to use the findings from this research to better inform employers of what works to improve employer practice, and get the full benefits out of an intergenerational workforce.

For more information on the Centre for Ageing Better and updates on our work, please follow us on Twitter [@Ageing_Better](https://twitter.com/Ageing_Better) or sign up for our email updates at <https://www.ageing-better.org.uk/sign-up-for-email-updates/>

4. Work, care, and welfare – insurance and public policy in an ageing society

Joseph Ahern and Henry Thompson, Association of British Insurers

Assertions about the divide between young and old are arguably at an all-time high in the UK following last year's referendum result, and were exhibited again during the General Election in June. Accusations of "you've never had it so good" are met with ripostes of "we never had the same opportunities that you have".

From a public policy perspective, we have seen political parties, notably the Conservatives in recent years, appeal to the silver vote in the knowledge of older people's increased propensity to vote. We have also seen this attitude reflected in the policy decisions taken since 2010 to reduce the UK's fiscal deficit, which have generally reduced state expenditure on the working age population. But policy changes on welfare and care could enable insurance and long term savings products to better support the working age population, and help address some of the perceived unfairness between younger and older generations.

Working age welfare

Welfare spending has been prominent in the debate on intergenerational fairness. State benefits for pensioners have largely been either protected or increased since 2010; in the most recent General Election campaign, attempts to remove the triple lock on the State Pension and reform social care funding damaged the Conservatives' prospects. However, working age welfare has been significantly scaled back, with some recent changes having a significant detrimental effect on the financial resilience of households impacted by the death or serious illness of a main earner.

Changes to Employment and Support Allowance (ESA) implemented in April this year will reduce the amount given to those claimants assessed as being in the Work Related Activity

Group (WRAG) from £103 to £73 a week. This amounts to a 28 per cent reduction in benefit for around 20 per cent of all ESA claimants. Recent reforms to bereavement benefits have reduced the maximum period of time that families can receive support from 20 years to 18 months. Other policies such as the benefit freeze and cuts to the work allowance in Universal Credit (UC) also reduce the overall generosity of the system.

Despite the chasm between the rhetoric of the two main parties both during the election campaign and since, Labour's manifesto suggested only a partial cancellation of Conservative welfare reforms. Given the bleak fiscal picture set out by institutions such as the IMF for decades to come, a wholesale reversal of the policies of the past seven years looks increasingly difficult for any future government. The raw logic of demographic change suggests a further focussing of limited public resources on the elderly.

A greater role for insurance could help to preserve and improve financial safety nets for working age households when the worst happens, with the added benefit to the Government of freeing up cash that can be put into other policy priorities.

Currently only 3.3 million out of a working population of 32 million are covered by some kind of income protection insurance. Of these, 2.2 million are covered by a Group Income Protection (GIP) policy paid for by their employer, and a further 1.1 million have an Individual Income Protection (IIP) policy which they have purchased themselves. A survey by the Money Advice Service (MAS) found that just over half of households have some kind of life cover.

Analysis carried out by the Centre for Social and Economic Inclusion (CESI) for the ABI suggests that this merely scratches the surface of the potential need across the population

A greater role for insurance could help to preserve and improve financial safety nets for working age households

for protection. According to the analysis, 60 per cent of households would see their income fall by at least a third if the main earner had to leave work for health reasons, and 40 per cent would see their income fall by more than half. Greater take up of insurance can help to close this huge protection gap for working age households.

Work and Health

As well as having a financial impact, being out of work for long periods of time can have a detrimental effect on an individual's health. Conversely, good work is associated with positive health outcomes and wider wellbeing.

Income protection can add value to the public purse, businesses, and households by supporting individuals with long term health conditions to remain in work. The return to work and wellbeing support services that are a core part of income protection products have a proven track record of cutting long term absences experienced by businesses. Reducing long term employee absence is important for all employers, particularly when faced with the challenges of an ageing population, and the increased instances of cancer, musculoskeletal conditions, and mental ill health that this can present in the workforce.

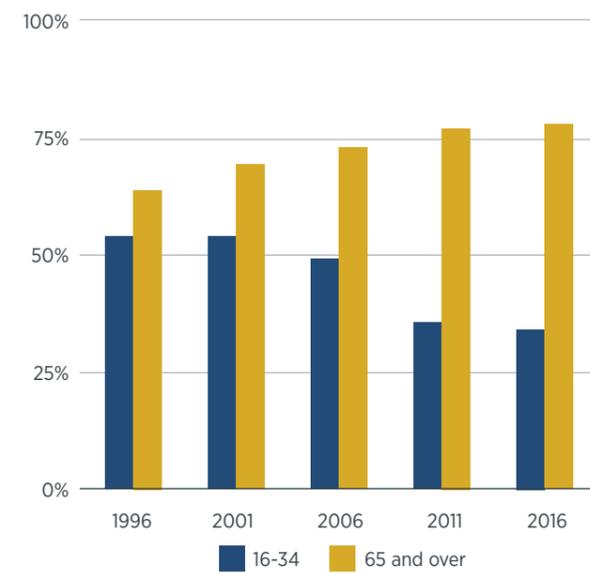
We were delighted to see the important role of income protection acknowledged in Improving Lives: The Work, Health and Disability Green Paper earlier this year, and look forward to further dialogue with the Government on our policy proposals to increase take up of protection insurance. This can go some way to improving the lives of working age adults who may not receive the State support enjoyed by older generations

Social Care

Fairness within and between generations cuts right to the heart of the debate about how we fund our social care system. Yet, however well-intentioned, the proposal in the Conservative manifesto for a simple 'capital floor' of £100,000 across all assets fell victim to our collective national attachment to housing and the old adage that 'an Englishman's home is his castle'. The Government will now revisit this long term issue, but for the next 20 years care will mainly be funded either by the State, or by sale of the family home.

Logic determines that young people are less likely to own property than older people, because it takes time to earn and save enough to buy a first home. However, this gap has increased over time. This trend in home ownership has consequences for funding care; it underlines why a multifaceted approach and range of solutions is necessary, depending on the age, needs and financial circumstances of individuals, both now and at the point of care.

Proportion households owner-occupying by age group of HRP



Source: Labour Force Survey, Household dataset, Q4 various years

New, innovative ways of funding care costs are essential. Successful policy interventions like automatic enrolment will improve saving in the round (and these need to go further) but consideration needs to be given to how tailored public policy solutions can target specific generations who can't rely on the same sources of wealth as their parents and grandparents.

Irrespective of age, work must be done to improve awareness of the fact that individuals, not the NHS, are likely to have to pick up the cost of care themselves. This awareness raising process must also highlight solutions and provide incentives. There is no silver bullet solution to meeting care costs, so a combination of pension savings and financial products, as well as housing wealth for those who have it, will be the likely interim solution.

Fairness between generations will remain a key question of policy debates for some time. Insurance and long term savings look set to play an important role in answering it.

5. The future of social care funding: who pays?

IFoA Pensions and Long Term Care Products Research Group

*... one man in his time plays many parts, his acts being seven ages ...
Last scene of all, that ends this strange eventful history, is second childishness
and mere oblivion, sans teeth, sans eyes, sans taste, sans everything.*

From the whining schoolboy to the toothless end of life's conclusion, Shakespeare all too aptly described the seven acts of life. In Shakespeare's day the final act may have been a swift one, so the trials of life portrayed in his text did not refer to the problems of long term care.

Modern life in the 21st century is now considerably different. The seventh act of life may still be short for some, but it is considerably longer for many others. That final act may require a troupe of supporting actors to support and sustain the main player with his or her later life needs.

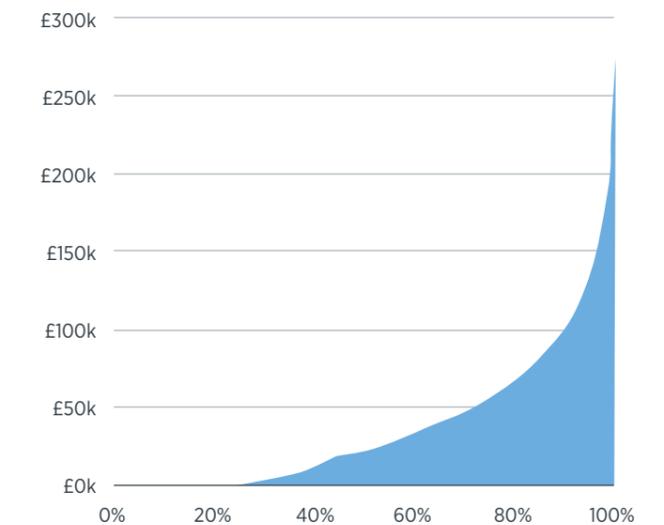
Generations X, Y and Z may be the current players in the earlier acts of Shakespeare's play but they will return to their own seventh act of life on a future occasion. Will their performance be an easier one for them than their predecessors faced in this role? Solving this could require a new stage and set.

The Government has indicated that it may wish to repaint the stage's current backdrop, namely the Care Act 2014, which sets out a framework with a key aim of protecting individuals from extreme care costs. Care costs in England are funded by a mixture of public and individual funds, with those provided by the state means-tested and primarily provided via local Governments. The Care Act requires local authorities to make more information available to help guide people, whether or not they have a current care need.

The key principles of the Act were founded on the recommendations of the Dilnot Commission¹ which reported to Government in 2011, highlighting the potential catastrophic costs that could befall those requiring long term care. Figure 1 shows that under the current system a significant proportion of people aged 65 face expected future lifetime care costs above £100k. Dilnot recommended a cap on social care costs,

set at £35,000 to protect individuals from this extreme risk. The coalition Government of 2011 accepted the cap, but set it at £72,000 in the Act.

Figure 1: Expected future lifetime cost of care for people aged 65 in 2009/10, by percentile (2009/10 prices)



Source: Dilnot Commission

However, the intended timetable for implementation changed in 2015. As a result, the introduction of the intended care cap and an associated public awareness campaign was deferred. The cap on care costs therefore remains a feature of political uncertainty, as does the way in which means testing thresholds for State support may change. The Government's promised consultation on the way forward later this year must set this new scene.

¹ | Fairer Care Funding: The Report of the Commission on Funding of Care and Support, July 2011 - <http://webarchive.nationalarchives.gov.uk/20130221121529/https://www.wp.dh.gov.uk/carecommission/files/2011/07/Fairer-Care-Funding-Report.pdf>

We believe there is scope for the Government and financial services industry to work together to understand better how to incentivise personal saving for later life needs.

Our working party's research has highlighted a number of areas for consideration²:

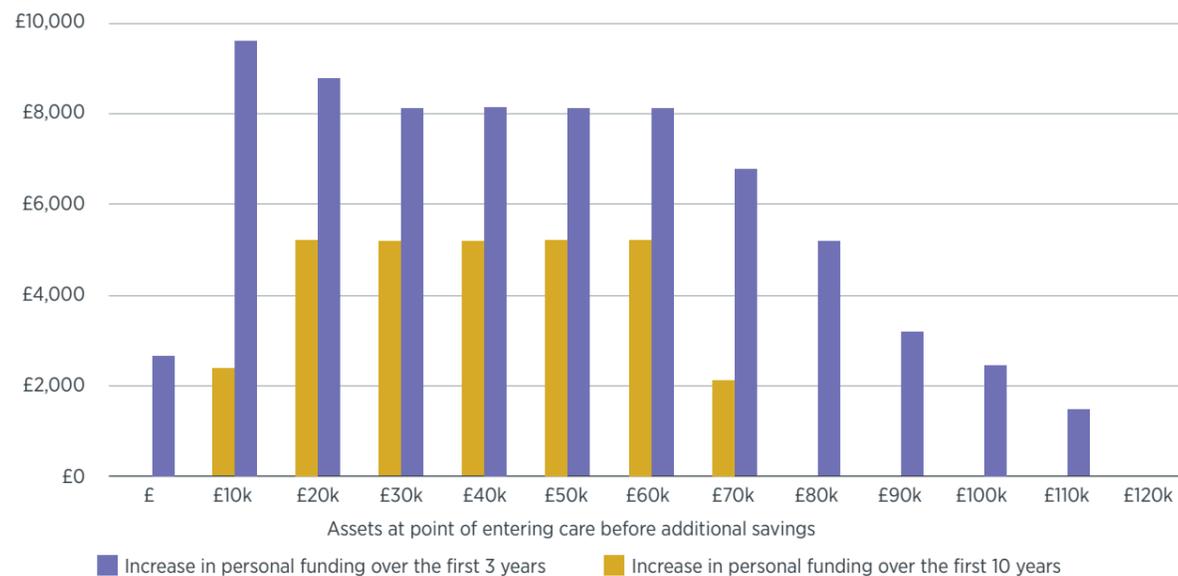
- The Care Act reforms are intended to alleviate, but not to remove, an individual's responsibility to meet at least some of their personal care costs. Financial products might help individuals to fund the long term care costs they may face, complementing the new flexibility under the Government's Pension Freedom and Choice agenda³.
- The complexities of the care funding system, and how care funding requirements might impact on an individual with long term care needs, need to be better understood.
- If individuals are to be incentivised to save for future care costs, the interaction with means testing thresholds needs to be fully considered. While the Act's proposed means testing thresholds (if they were to be implemented) improve the current situation, there might still remain some significant financial disincentives to saving. Figure 2, for example, shows how the Act's proposed means testing system may still disincentivise saving to fund long term care, due to that saving being partially offset by the higher personal costs which then arise under the means testing rules.

But what does this mean for intergenerational fairness? We believe there is scope for the Government and financial services industry to work together to understand better how to incentivise personal saving for later life needs. This could remove the potential strain on State provision, which is ultimately funded by the working age population, and help to prevent the draining of an individual's assets and the effect this has on the inheritance of future generations.

Public debate on social care often misunderstands the important intricacies of Government proposals. A common misconception is that the proposed £72,000 care cap under the Care Act 2014 includes all care home fees, whereas accommodation and other costs not associated with the underlying care component (the so-called 'hotel costs') are still payable in addition. We have therefore stressed the importance of educational campaigns to raise awareness and understanding. We believe lack of understanding is a key barrier to saving, for incentivising a person to save requires a clear understanding of a potential care cost need.

Our work has focussed on the ways the existing social care funding system and the Care Act 2014 proposals affect

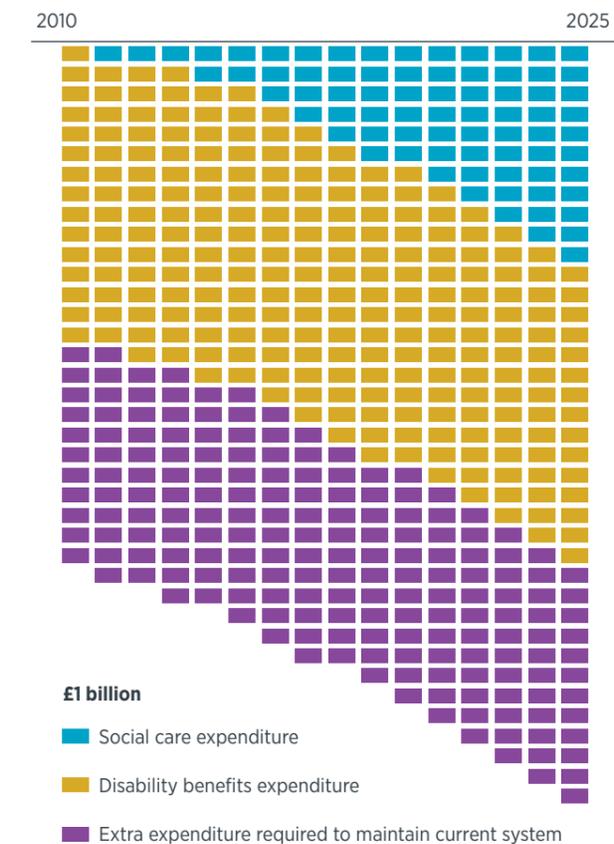
Figure 2: Increase in personal costs from saving an additional £10k towards care costs



2 | The Future of Social Care Funding – Who Pays?, IFA Products Research Group, April 2016 - <https://www.actuaries.org.uk/documents/future-social-care-funding-who-pays-0> (see section 4.1 and appendix 3 for methodology)

3 | As per the then Chancellor's Spring 2014 Budget announcing flexibility of access to pension saving, now implemented in legislation, primarily the Taxation of Pensions Act 2014.

Figure 3: Current and future public expenditure on Adult care and support in England, 2010-25 (2010 prices)



Source: Strategic Society Centre, *The Roadmap: England's choices for the care crisis*

individuals. However, a key area for debate is whether or not the funding of social care should be fundamentally redesigned. The proposals yet to be introduced by the Care Act 2014 would help resolve some current issues, but do they go far enough?

Should care funding come from current tax revenues and private funding as it does now, or should there be a pre-funded element to it to shift the burden from current tax payers so that each generation pays a fairer share?

The answer to this question, which is at the heart of the social care debate, will clearly have implications for the social contract between current and future generations.

Care funding has proven to be something of a political hot potato, as observed in the recent election, and few would doubt that the current social care system urgently needs attention. We suggest that there should be a comprehensive cross-party review of the long-term sustainability of social care and health provision in England.

It remains to be seen how these issues will resolve. The seventh act of life awaits new stage direction. We look forward to playing our part to help achieve this aim.

6. Social care: a prefunded solution

Danail Vasilev, Reform

Social care is one of the most pressing public policy issues. The focus of the public debate, appears to be on reforming the way benefits are distributed, rather than how we pay for the service. Continuing to finance old age care through general taxation, however, will burden a younger generation hit by a decade of low wages and high rents. Pre-funding care services could address this issue, bringing intergenerational fairness as well as economic efficiency.

Prefunding broadly means a scheme where the government obliges citizens to save for later-life needs in a pooled fund. These savings are not used to pay for today's pensions and social care, but are instead invested in equity and bonds. Once the contributors retire, they can benefit from the accumulated funds and interest earned on them.

No country currently pre-funds its social care, but the practice has found its way in pension systems across the world. In the late 90's, many states faced large pension deficits. Ageing populations meant impossibly high taxes would have to be levied on workers in the future in order to cover state pensions. Although not always successful, pre-funding in this way has put pension finances on a sustainable footing in countries such as Sweden and Ireland.

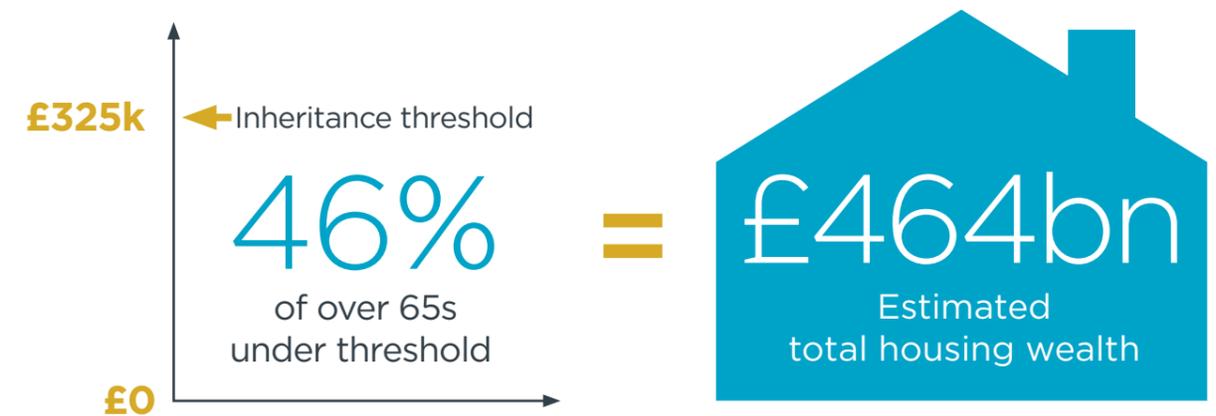
In England, social care expenditure is set to rise from 1 per cent of GDP to 2 per cent by 2066-67⁴. Much of this increase will be driven by the growing proportion of older people in the country. In a recent report, Reform estimated that without a change to the funding model, people born in the early nineties could pay 10 per cent more towards social care than those born just a decade earlier.

Pre-funding can solve this problem. Instead of paying for today's old-age care, the working age generation will be required to save in a Later Life Care Fund. The Fund will be left to mature and will only start paying benefits when the contributors retire. In this way, the workers will not have to finance the care of a much larger cohort. Moreover, the interest that the fund will potentially earn, will keep the level of contributions low.

Swedish pension funds demonstrate what a well-managed government scheme can achieve. The country's four main retirement funds have grown at an annual rate of more than 5 per cent after costs since their inception in 2001.⁵ This is 3 percentage points higher than GDP growth over the same period. Reform calculates that with similar returns, a pre-funding option could deliver the same level of coverage as the current system at 18 per cent lower cost.

The natural question that arises is if the working-age population is saving for future care needs, who would be paying for the people who need support today? In most cases, such transitions require the younger generation to pay twice – once for the current old, and again for itself. Countries where such reforms were introduced, have made sure to gradually phase-in pre-funding so that big shocks to take-home earnings are avoided. In England, however, there is a more palatable option to finance the transition.

The answer may lie with the housing assets of the older population. Data from the English Longitudinal Study of Ageing suggests that 46 per cent of over 65s have total assets of less than the inheritance tax threshold (£325,000) and financial



savings of less than the domiciliary care support threshold (£23,250). This means that almost half of pensioners do not pay inheritance tax, but would be eligible for immediate council support if they acquired a given level of disability. With a mean home value of £101,000, the total housing wealth of this group is estimated at £464 billion. To put this number into perspective, the entire annual bill for old age care is a little more than £20 billion.

The above figures illustrate the potential of housing wealth to fund current care liabilities, while a national care fund is introduced. The question of how to release wealth from those assets, however, is difficult. Ministers could consider a range of options from a lower threshold on inheritance tax to exploring ways to support a private equity release market for domiciliary care. These options should be thoroughly researched.

Tapping into housing wealth, nonetheless, is politically difficult. Every time a tax on inheritance is proposed, it is immediately rejected. This calls for a serious public discussion about the relative responsibility of generations towards funding care and the welfare state in general. Overcoming the aversion to taxing wealth may create the needed fiscal space for radical social care reform.

Very often proposed care reforms are dismissed for being too short-sighted, or the opposite – for failing to address current issues. Pre-funding falls in the category of long-term solutions. Nonetheless, exploring options to use housing wealth in the transition period can offer a comprehensive solution –one that can improve the welfare of people needing support today, but also for generations to come.

Countries where such reforms were introduced, have made sure to gradually phase-in pre-funding so that big shocks to take-home earnings are avoided.

4 | Office for Budget Responsibility, Fiscal Sustainability Report 2017; "Economic and Fiscal Outlook - March 2017."

5 | See for example <http://www.ap4.se/globalassets/dokument/rapportarkiv/2017/halvarsrapport-2017/ap4-interim-report-2017.pdf>.

7. Ensuring intergenerational equity when medicine for the elderly starts to actually work

Aubrey de Grey, Chief Science Officer, SENS Research Foundation

Humanity has been acutely aware, since at least the dawn of civilisation, of the terrible decline into decrepitude and eventual death that awaits everyone who was born long enough ago. Our utter inability to prevent that decline has weighed so heavily upon us that we have resorted to all manner of psychological tricks, however irrational they may need to be, to put aging out of our minds. So effective has this been that even highly erudite scientists often assert that the medical elimination of aging, far from being our crowning achievement, would be an indescribable tragedy. In my view, this is all driven by the fear of getting our hopes up, following so many anti-aging false dawns throughout history. But the overwhelming balance of evidence today is that we are, finally, within striking distance of that goal. And, of course, since these days the vast majority of deaths in the industrialised world (and already a very high proportion in the developing world too) are caused by the ill-health of old age, one side-effect of eliminating that ill-health will very probably be a dramatic increase in life expectancy. The inescapable implication is that the intergenerational “contract” with which we have lived for so long will need to be torn up and rewritten from scratch.

In the past, transformational technological advances have sprung forth, without warning, from the workshops and clinics of a handful of specialists, and society has had to work out how to make the most of them essentially by trial and error. It is obvious that, in hindsight, the Industrial Revolution and the post-Pasteur rise of modern medical practice (to name but two) could have been managed with less turbulence and quicker benefit to humanity had we seen them coming. And this time, we can see the revolution coming. Preclinical and clinical trials of novel anti-aging therapies occur under an intense spotlight of public interest. Thus, if we fail to anticipate their arrival and figure out how best to capitalise on it, we have only ourselves to blame.

One feature that cannot be overstated is that, without doubt, the medicines that will truly defeat aging will be rejuvenative. They will not slow down the decline in our health, they will not arrest it – they will reverse it, both mentally and physically. Thus, in the world we are discussing, every recipient of these therapies will be biologically a young adult. I only have 800 words, so if you don't believe me, there's always Youtube.

Another key feature to take into account is that the indefinite youth of the elderly will arrive in a world that will also have undergone many other dramatic changes – especially in the nature of work, as a result of AI-fuelled automation. The increased prosperity that this will bring will be a challenge to distribute equitably, especially across generations, and may provide lessons that we can then apply in relation to medical progress.

So much for the landscape: what about the specifics? Well, the response of society to changes that most people are still trying to pretend will never happen is necessarily hard to elicit from surveys, so much guesswork is needed – but one certainty is that retirement will work very differently. In a world with contemporary levels of automation, one might imagine that retirement will be abolished, since it could equally be called “permanent sick leave” and people that old won't be sick any more. We might opt for a less drastic option, letting people retire when they enter (say) the oldest 20% of the adult population of their country, thus locking in a manageable dependency ratio. But what if automation does indeed provide a world in which manpower requirements are greatly reduced? The service sector let us preserve the full-time employment concept a century ago, but that will not be repeated – think about it, how many entertainers do we need? So work might, by the time a post-aging world arrives, have become a bit like conscription: something that young adults are required to do for a few years and that's that. In that scenario, the intergenerational aspect will be the least of our wealth equity problems: concepts such as universal basic income will need to be greatly enhanced in order to satisfy society.

Access to rejuvenation therapies must also be equitable, of course, but that problem will peak and then subside, because those therapies will be needed periodically by everyone over 50 or so, and will not need to be more sophisticated for progressively older people. With time, it is almost certain that fewer and fewer babies will be born per year as a proportion of the total population, so a greater majority of the population will be of the required age.

8. Antimicrobial Resistance

The IFoA Policy Team

Antimicrobial resistance (AMR) sits alongside climate change on the Global Risk Register – the theme of our first Intergenerational Fairness Bulletin. Like climate change, the emergence of antimicrobial resistance as a global risk has arisen as a result of accelerated consumption over recent decades.*

Alexander Fleming discovered the first antibiotic penicillin in 1928 and as early as 1945, he warned of bacterial resistance to penicillin and other similar drugs.ⁱ During this time in the UK age-standardised mortality attributable to infectious disease fell from around 1 in every thousand in 1940, to below 0.1 in every thousand by 1971.ⁱⁱ From the 1970s until recently, Europe and the US had regarded the battle with infectious diseases as something of the past, although there were some notable exceptions (e.g. HIV/AIDS).

So what's the problem?

The US Centers for Disease Control and Prevention has estimated that AMR is responsible for an excess mortality of 23,000 per year in the US.ⁱⁱⁱ In Europe and the US combined, it is estimated that antibiotic resistant infections cause around 50,000 deaths per year. When we look globally, the prevalence is even higher, with the World Health Organisation finding an alarmingly high resistance rate in common bacteria worldwide.^{iv}

AMR is on the Global Risk Register because its growing prevalence suggests that we are running the risk of a post-antibiotic era, where some infections will become fatal if we cannot treat them. Despite awareness of the risks, global consumption of antibiotics rose by 36% between 2000 and 2010. This was largely due to increasing consumption in developing countries such as Brazil, India and South Africa.^v

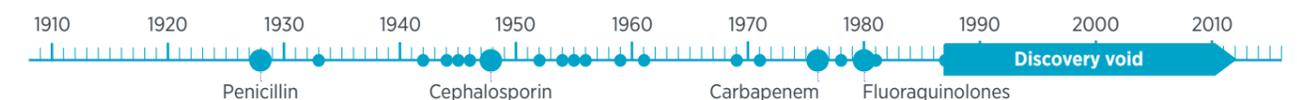
Overuse and inappropriate consumption of antibiotics, not just limited to humans but also animal medicine and agriculture, is contributing to the growing problem of AMR. Sharing antibiotics and not completing a full course of antibiotics, or not using the right antibiotic for a specific infection, will not kill the drug-resistant population, and even worse will give it an advantage as the non-resistant bacteria is killed. This is a result of the evolution of bacteria, where the more antibiotics we used, the greater the selection pressure for drug-resistant bacteria to emerge.

We are reaching the point where some infections are ‘pan-resistant’, meaning they are resistant to every available antibiotic used to treat that infection. In the worst cases, this could prove fatal. Even where an infection is not ‘pan-resistant’, resistance to antibiotics is associated with poor clinical outcomes, as well as increased use of resources. As previously discussed throughout this bulletin, increasing resistance to antibiotics further strains our already precarious health resources and escalates the multitude of intergenerational fairness issues.

Intergenerational Fairness

Antimicrobial resistance represents a clear threat, with actions taken in the past and today potentially affecting the health prospects for future generations. What do future generations need current generations to do to help curb this threat?

- The most urgent and cost effective action is to change behaviours towards more sustainable antibiotic use. Not only is overuse and inappropriate consumption of antibiotics occurring at the international level, antibiotic prescribing is increasing here in England, particularly in the most deprived areas. This suggests education around appropriate antibiotic use is not just a phenomenon in some lower income countries, but also in lower income areas of high-income countries.^{vi}
- Antibiotic resistance is developing quicker than we can develop new antibiotics, with no new class of antibiotics being made available for treatment since 1987.^{vii} The investment required to develop new antibiotics has proven immense partly because of the time taken to undertake clinical trials and gain regulatory approval. The new drug pipeline is now beginning to show more signs of activity than at any point since the 1960s, although there is no certainty that any of these will progress to treatment.
- Finally, we need improvements in sanitation and health systems globally. Ensuring access to clean water and building strong public health systems that prevent infectious disease will go some way to reducing their spread and remove the need for excessive use of antibiotics.



* Antibiotic resistance occurs when bacteria lose their sensitivity to antibiotics. AMR refers to resistance of viruses, fungi, worms, malaria and bacteria.

Case study: Tuberculosis (TB)

TB is highly contagious and requires a six-month course of treatment with antibiotics. In the last 50 years, since antibiotics were introduced, there has been a gradual increase in cases of multi-drug resistant (MDR) TB.

The length of time taken to treat the disease means that many people do not finish the full course of antibiotics, particularly where there is a lack of good health provision infrastructure. However, the treatment for MDR TB is significantly longer, in some cases requiring two years of intensive chemotherapy. Where health resources and infrastructure are limited, continuity of care for this long is even less likely than the six months of treatment required for non-MDR TB.

In 2014, the global mortality rate for TB was over 15%, for those with extensively drug resistant TB the mortality rate rises 30%, and this increases to 47% if we look at South Africa alone – where TB prevalence is particularly high.^{viii}

As these statistics demonstrate, the higher prevalence of TB and MDR TB in countries such as South Africa has a greater chance of fatal consequences. Moreover, if MDR TB becomes more commonplace without a global response, some of the gains in eradicating TB in high-income countries are at a high risk of being lost. Already in the UK, one-third of London boroughs exceed the World Health Organisations high incidence threshold of TB. In 2014 alone there were 2,500 new cases of TB in London.^{ix}

Note: This article was drafted using excerpts from the IFoA's Longevity Bulletin, Antimicrobial Resistance, 2016. To read the Bulletin in full please visit our website: <https://www.actuaries.org.uk/documents/longevity-bulletin-antimicrobial-resistance-amr-issue-8>

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