



Advancing our health: Prevention in the 2020s

The Institute and Faculty of Actuaries (IFoA) is a royal chartered, not-for-profit, professional body. We represent and regulate over 32,000 actuaries worldwide, and oversee their education at all stages of qualification and development throughout their careers.

Key points

Preventative health enables and empowers people to live fulfilling lives and promotes physical and mental well-being. The IFoA is supportive of this consultation's focus on disability-free life expectancy as both disability-free life expectancy (DLE) and healthy life expectancy (HLE) are useful indicators for assessing the impact of preventative health policies.

Improvements in life expectancy are slowing and people are spending a greater proportion of their later years with health and care needs. The ongoing debate about the social care crisis has highlighted there is a care gap, which is set to rise as the UK population ages. Therefore a comprehensive approach to prevention is required if we are going to meet the needs of an ageing population and also ensure that extra years of life are spent disability-free and are fulfilling. Otherwise the high cost of social care could have significant economic consequences for both individuals and the State.

People who live in deprived areas are not accessing health services in the same way as those in more affluent areas. This has serious implications in terms of understanding the service needs of different groups of the population and in tackling health inequality.

Whilst the impact of wearables remains inconclusive regarding long-term behavioural change, evidence suggests that they can have a positive effect as part of a comprehensive approach to disease management. In particular, chronic disability resulting from type 2 diabetes has been found largely preventable with the right incentives around nutrition and lifestyle.

Beijing

Edinburgh

Hong Kong

London (registered office)

Oxford

Singapore

14F China World Office 1 · 1 Jianwai Avenue · Beijing · China 100004 · Tel: +86 (10) 6535 0248

Level 2 · Exchange Crescent · 7 Conference Square · Edinburgh · EH3 8RA · Tel: +44 (0) 131 240 1300

1803 Tower One · Lippo Centre · 89 Queensway · Hong Kong · Tel: +852 2147 9418

7th Floor · Holborn Gate · 326-330 High Holborn · London · WC1V 7PP · Tel: +44 (0) 20 7632 2100

1st Floor · Park Central · 40/41 Park End Street · Oxford · OX1 1JD · Tel: +44 (0) 1865 268 200

163 Tras Street · #07-05 Lian Huat Building · Singapore 079024 · Tel: +65 6906 0889

1. The Institute and Faculty of Actuaries (IFoA) is encouraged by the Government's commitment to increasing healthy life expectancy through proactive, predictive and personalised prevention. Both disability-free life expectancy (DLE) and healthy life expectancy (HLE) are useful indicators for assessing the impact of preventative health policies. We hope the findings from this consultation support government to direct its focus towards initiatives that enable and empower people to live fulfilling lives and put prevention of the onset and deterioration of ill-health at the forefront of decision-making. The IFoA is of the view that, if properly targeted, the human and economic benefits from a preventative approach to population health would provide significant benefit.
2. A preventative approach will need to be underpinned by a comprehensive understanding of the health characteristics of the population at a sufficiently granular-level. This will be essential to facilitating targeted interventions; whether based on 'demographic' factors such as region, gender or age, or health factors such as weight, hypertension or smoker status. This will both enable health and care services to forecast future demand for services, and to assess the effectiveness of interventions for different segments of the population. This in turn would enable targeting of resources to achieve optimal health outcomes and value for money. In 2018 the IFoA initiated a research project that combines risk stratification, impactability modelling and actuarial variability analysis to help target patients for medical management and to support the improvement of resource allocation.¹ Once the results are available we would very much welcome the opportunity to speak with both the Department of Health and Social Care and the Cabinet Office.
3. Actuaries are interested in understanding morbidity and mortality trends because they have a direct impact on the pricing, underwriting and reserving of insurance products, as well as on the assessment of pension scheme liabilities. As the UK's professional body for actuaries, the IFoA has numerous outputs and research projects underway that may be of relevance to this inquiry. We have included a brief summary of these as an appendix. As with the research project referenced above, if you would like to discuss any of these with us, we'd be delighted to facilitate a meeting with the relevant expert IFoA members.
4. We have only responded to those questions where the IFoA is able to make an evidence-based contribution.

Q - Which health and social care policies should be reviewed to improve the health of people living in poorer communities, or excluded groups?

5. The prevention, onset and successful treatment of some diseases is impacted by individuals' ability to access health services. Therefore the reasons that those in more deprived areas are not engaging with health services in the same way that those in more affluent areas could usefully be explored as a hypothesis for why there is a higher death rate amongst those living in deprived areas. This has serious implications in terms of understanding the service needs of different groups of the population and in tackling health inequality. This is something that the IFoA is exploring through one of its commissioned research projects with Heriot Watt University, and once again as we develop our findings we would be delighted to share them with the Department of Health and Social Care (DHSC) and the Cabinet Office (CO).
6. Specifically, in relation to social care - one of the main barriers to people receiving domiciliary care at early stage onset is the cost, as the State only provides funding for those with severe needs who have below £23,250 in income and assets. Earlier interventions that empower individuals to perform essential daily tasks independently, for as long as possible, could both improve that individual's

¹ <https://www.actuaries.org.uk/documents/1300-population-health-management-shah-beddows-buckle-martin-culkin>

health and wellbeing, and reduce the likelihood that they will need, or at least delay, more costly interventions.

7. One expectation from the Care Act 2014 proposals was that people would undertake a care assessment sooner than they might do currently, as it would determine when their care costs would start to count towards the 'cap'. Earlier assessment could in turn lead to earlier, potentially less costly, intervention. Therefore we encourage the Government to think about how it could encourage people to have their care needs assessed sooner and be supported to access potentially lower cost solutions, rather than waiting until the point of crisis because they are concerned about potentially expensive care costs.
8. Another factor in the Care Act 2014 proposals that would have benefitted lower income households was the increase in the means testing threshold. The current means test essentially means all homeowners will have to pay towards their care, even if they have very little income. Therefore we recommend that an immediate priority is increasing the means-testing thresholds to protect those least able to meet their care costs. Universal Deferred Payment Agreements mean that people would not have to move home necessarily, but the roll out of this policy has been inconsistent and limited. Again, the legislation for this solution is already in place, but requires government to ensure it is implemented consistently.

Q - What ideas should the government consider to raise funds for helping people stop smoking?

9. There is mixed evidence on the effectiveness of e-cigarettes in helping people to stop smoking. The NHS has suggested that e-cigarettes have helped many thousands of people quit smoking.² Whilst Public Health England has stated that e-cigarettes are around 95% less harmful than tobacco.³ These findings indicate that e-cigarettes should be encouraged and could be a useful avenue to channel funding. However, e-cigarettes have been on the market for a relatively short period of time and some experts believe that evidence regarding the effects of e-cigarettes on health and cessation of smoking remain inconclusive.⁴ Indeed increasing commentary from the US has expressed concerns about the safety and the 'gateway risk' i.e. that users of e-cigarette are more likely to become smokers.
10. There could be significant reputation risk for the government, PHE and NHS if it funds e-cigarettes as a method of cessation until it has greater certainty that e-cigarettes are safer, for all segments of the population or that guidelines reflect any particular concerns, and that they are not a gateway to smoking, particularly amongst younger cohorts. The National Institute for Health and Care Excellence (NICE) guidelines also acknowledge evidence gaps remain.⁵ Therefore the IFoA suggests that funding is aimed at gaining a better understanding of the pros and cons of e-cigarettes in the first instance. The IFoA's view is that studies to date have in the main been small-scale and often performed by companies with a vested interest, therefore a large scale independent study would be beneficial. Otherwise, until there is a more established evidence base the IFoA suggests that funding should be aimed towards other initiatives where the evidence is robust.

Q - How else can we help people reach and stay at a healthier weight?

11. There are multiple examples of interventions that have had a positive influence on health behaviours from the insurance sector that government may wish to consider:

² <https://www.nhs.uk/live-well/quit-smoking/using-e-cigarettes-to-stop-smoking/>

³ <https://www.gov.uk/government/news/e-cigarettes-around-95-less-harmful-than-tobacco-estimates-landmark-review>

⁴ <https://smokefree.gov/quit-smoking/ecigs-menthol-dip/ecigs>

⁵ <https://www.nice.org.uk/guidance/ng92/evidence/c-advice-on-ecigarettes-on-general-sale-pdf-4788920848>

- a. In the US, the insurance sector is using wearables to promote healthier living. One example is 'Blue Shield: Wellvolution', a non-for-profit insurer based in California. Wellvolution assigns employees challenges that they earn points for completing. This scheme has resulted in a 50 percent reduction in smoking, 66 percent reduction in hypertension and a \$3million saving per annum in insurance premiums amongst its 5,000 employees.⁶
 - b. Another example is Vitality, a global insurer which has a programme that incentivises members to live healthier lifestyles by providing them with rewards for achieving specified health goals. Rewards include discounts on travel, healthy foods and leisure activities. This programme allows members to connect their wearables to their profile for data to be gathered in order to collect points. This also enables a more granular assessment of risk and provides greater insight into an individual's morbidity and mortality risk.⁷
 - c. The UK based Havenrock Group has an income protection cover that incorporates wearables to improve employees health and productivity by reducing stress, fatigue and absenteeism. This cover gives each insured employee a free activity tracker and a free annual health check-up at their workplace. Data from these are combined on an online health portal that offers employees advice, annual reports and notification of any health issues they might wish to seek medical advice for. The employer also benefits from an anonymised overall annual health status report on its employees.⁸
12. These are far from the only examples, with many insurers now offering 'lifestyle' options that provide individuals with rewards for positive behaviours – as this reduces their risk profile. However, this relies on individuals being willing to share their data and the insurer having the capacity and expertise to translate this data into a risk profile. It is worth bearing in mind that the use of wearables is just at the start of the journey and on a learning curve towards finding the optimal practical applications of such technology with many aspects as yet untried, tested or indeed backed up with quantifiable evidence. Evidence regarding long-term behavioural change is particularly inconclusive, with a number of studies finding that the positive behavioural effects of wearables are often short-lived. This suggests that wearables alone will not improve health behaviours and therefore we suggest that technology could form part of a comprehensive approach to public health, by initiating positive behaviours, but that methods for achieving long-term change are explored further.⁹
 13. The IFoA's Diabetes Working Party has undertaken some analysis that assesses the use of wearables and associated incentives for diabetics and has found that wearables can have a positive impact when used by those who need to change their behaviour to manage the disease. The working party has members from Europe and Asia, as well as the UK and is now undertaking funded research into mortality and morbidity for diabetics and people at risk of developing diabetes. The research considers chronic disability from people being type 2 diabetics as largely preventable with the right incentives around nutrition and lifestyle. An annual estimate of the NHS cost for treating diabetes and associated complications is around £10bn and this is expected to increase year on year unless preventive action is taken on major challenges around poor nutrition, lack of exercise and obesity.¹⁰
 14. The insurance industry in the UK has recently launched targeted life insurance products to support diabetics (such propositions have recently been launched by Royal London/All Life, Exeter Friendly and Vitality). These propositions provide a service to support their consumers with diabetes to reduce their HbA1c level, thereby reducing their premium as a reward, and crucially it results in better health outcomes. This demonstrates that technology can be an important component of the

⁶ <https://www.blueshieldca.com/bsca/about-blue-sheild/careers/wellvolution/incentives.sp>

⁷ IFoA (2016) *Wearable technology: A health and care actuary's perspective* [Author: Matan Abraham]

⁸ *ibid*

⁹ Section 6 <https://www.actuaries.org.uk/documents/final-draft-sessional-paper-wearables-and-iot-working-party>

¹⁰ <https://www.diabetes.org.uk/resources-s3/2017-11/diabetes%20uk%20cost%20of%20diabetes%20report.pdf>

solution to educate, challenge and incentivise customers to change their behaviour in a cost-effective way.

15. The IFoA views this as an area where the insurance industry could work with the government to drive forward behavioural changes on a larger scale and would be delighted to organise an opportunity for DHSC and CO to meet with industry experts to explore this further.

Q - What is your priority for making England the best country in the world to grow old in, alongside the work of Public Health England and national partner organisations?

- **Support people with staying in work**
- **Support people with training to change careers in later life**
- **Support people with caring for a loved one**
- **Improve homes to meet the needs of older people**
- **Improve neighbourhoods to meet the needs of older people**
- **Other: _____**

16. We suggest that government should not seek to look at any one of these in isolation. It makes sense that the consultation identifies all of these factors in promoting 'good ageing'. The proportion of people aged over 80 is set to double between 2010 and 2030 and reach 8 million by 2050.¹¹ Therefore a comprehensive 'ageing strategy' is required by government if we are going to meet the needs of an ageing population and ensure that extra years of life are spent disability-free and are fulfilling. That is why the IFoA is supportive of this consultation's focus on DLE. This question identifies the reliance of the health and care sector on other areas of social policy such as employment and housing, thereby supporting a need for cross-government thinking and action, in order to truly implement a preventative approach to health and care.

17. Another aspect is that if people are healthier they remain more productive, continue in the workforce and can be taxed, which helps to fund the costs of care and retirement more generally. One of the key indicators of an ageing population is the old age dependency ratio, which is effectively the proportion of the population that is retired in comparison to the working population i.e. those who will be receipt of age-related benefits, and those who will be paying taxation to meet those benefits. The proportion of those in retirement compared with those in the working age population is increasing and this places financial pressures on today's workforce. One way of managing this is by increasing the State Pension Age, but unless people remain healthy and in employment this loses some of its impact. In addition, it can leave people without the financial support necessary to meet their needs, as working-age benefits are in most cases lower than age-related benefits.

Q - What more can we do to help local authorities and NHS bodies work well together?

18. One issue that the IFoA has experienced in its research is the availability of data across the care sector. Adequate provision of health and social care for the elderly population requires forward planning based on analysis of disease trajectories, progression of frailty and the level of care needed at each stage, with its associated costs. The complex multi-morbidity experienced amongst the older population means that access to individual anonymised data is needed in order to assess how disease and risk factors determine the need for support. Access to detailed data will enable a better understanding of interactions between diseases, interventions and social factors that will enable local authorities and NHS bodies to develop a more comprehensive understanding of potential future demands on their services and plan accordingly.

Q - What other areas (in addition to those set out in this green paper) would you like future government policy on prevention to cover?

¹¹ <https://www.parliament.uk/business/publications/research/key-issues-for-the-new-parliament/value-for-money-in-public-services/the-ageing-population/>

19. Findings from our ongoing commissioned research have found that some NICE guidelines could usefully be reviewed as an increased evidence base is allowing for a more granular assessment of the impact of preventative health interventions. Here is a snapshot of a few of our key findings to date:
- a. We found that the effectiveness of statins as a preventative measure differs dependent on age – with it having little impact on those below age 60, but that it does improve life expectancy for older ages, especially so for those aged 80 and above. Based on these findings, and rates of prescription across these age groups we suggest that statins are over-prescribed amongst those below 60, but under-prescribed to those aged 80 and over.
 - b. Intensive treatment of systolic blood pressure (to less than 120 mmHg versus standard treatment to less than 140 mmHg) may be harmful in the general population in the UK where there is widespread access to routine healthcare via the NHS. However, it would be beneficial in patients at a high-risk of diabetes and chronic kidney disease.
 - c. Waist-to-height ratio (WHtR) is a better indicator of cardiometabolic risk (a significant predictor for mortality) than traditional BMI. This is because BMI overestimates fat in muscular people and cannot provide information about fat distribution. In contrast, WHtR is a better proxy for central fat, which has greater associated health risks than fat stored in other parts of the body. Encouraging the use of the WHtR, a simple metric which requires no more than a tape measure, would provide a more accurate depiction of an individual and the population's health risk.¹²
20. Where and when it is possible to develop a more granular assessment of preventative interventions we encourage the Government to adopt a targeted approach. The development of deep learning models will be important in achieving this as they can help provide early diagnosis of less common diseases, or early indication of problems such as side effects from treatments. This is reliant on the sharing of data across the NHS, on an anonymised basis. This is in line with Caldicott Principle 7 - that the duty to share information can be as important as the duty to protect patient confidentiality.

Should you want to discuss any of the points raised please contact Rebecca Deegan, Head of Policy (rebecca.deegan@actuaries.org.uk).

Yours Sincerely,



Jules Constantinou
Immediate Past President, Institute and Faculty of Actuaries

¹² <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0103483>

Appendix Overview of relevant Institute and Faculty of Actuaries reports

Working parties

[Antibiotic Resistance](#) – to examine the rise of Antibiotic resistance ('ABR') and how it has become an increasing concern to the medical professions, health services and governments of the world's major economies.

[Diabetes](#) - to research the risk factors, incidence and mortality of diabetes along with future plausible trend scenarios which are of relevance to working actuaries. Given the high prevalence of this disease and implication on NHS budgets and mortality/morbidity implications we view this is a key public interest issue which will also have consequences for the insurance industry.

[Impact of E-Cigarettes](#) – to examine the emergence of e-cigarettes and their impact on insured lives.

[Population Health Management](#) - to promote the development of population health management within the actuarial profession and the health sector.

[Product Research Group](#) - to explore the role of pensions and other products which could provide a framework for saving to meet potential long term care needs.

Actuarial Research Centre projects

Use of Big Health and Actuarial Data for understanding Longevity and Morbidity Risks

This commissioned research programme develops new methods for assessing basis risk and evaluating longevity improvement based on Big Health and Actuarial Data

Programme objectives

- identification and quantification of the key factors affecting mortality/longevity such as lifestyle choices, medical conditions and/or interventions
- modelling of temporal changes in the factors affecting morbidity and mortality
- evaluation of plausible scenarios in mortality trends due to particular medical advances or lifestyle changes on the population of insureds of relevance to actuarial community
- tools to forecast longevity risk of a book based on realistic scenarios of uptake of various health behaviours and/or interventions, or of particular disruptions to population health

Modelling, Measurement and Management of Longevity and Morbidity Risk

This programme is application driven, with impact and innovation in the pensions and insurance industries and beyond as its primary aims.

Programme objectives

- development of the next generation of single and multi-population mortality models that are robust, straightforward to apply and that are designed explicitly to push back the barriers to financial innovation
- developing open access modelling of the key drivers of mortality such as smoking, obesity and other lifestyle factors and understanding how these interact with all-cause mortality and cause-of-death mortality data
- development of a robust, scientific approach that helps key stakeholders to understand better the wider range of options for managing longevity risk
- development of new methods for pricing and reserving for Critical Illness Insurance

Longevity Bulletins

Edition 3: Variation in longevity – This issue of Longevity Bulletin assesses the relationship between average lifespan and the variation of lifespan within a population in the context of avoidable health inequalities and socioeconomic inequities.

Edition 4: Healthy Life Expectancy - Health expectancies add a quality dimension to life expectancy. Differences in health life expectancy between countries and regions are often much greater than differences in life expectancy, so measuring health disparities by life expectancy differences may underestimate disparities. The UK as a whole appears to be going through a period of compression of disability, with disability-free life expectancy at birth rising faster than life expectancy, particularly for males.

Edition 7: Longevity Modelling – The last century had seen significant improvements in mortality rates and the continuing increases in life expectancy have brought to the fore the critical importance of longevity modelling. It is not surprising that the understanding of longevity risk and factors affecting future longevity, such as lifestyle, medical advances, and health care policy, are attracting more attention. This issue of the Longevity Bulletin discusses drivers of longevity improvements and considers characteristics of two broad families of models – extrapolative and causal models.

Edition 8: Antimicrobial Resistance - Antimicrobial resistance (AMR) is perceived as a growing threat to health and well-being globally. Drug-resistant infections are estimated to cause 10 million deaths a year and cost up to £66 trillion by 2050. This edition of the Longevity Bulletin examines the clinical implications, impacts on longevity and the potential economic cost of current trends in AMR. It also goes into detail on new research and discoveries in creating new antibiotics.

Edition 9: Big data in health - Big data is now being used to predict epidemics, cure diseases, improve quality of life and avoid preventable deaths. In other words it provides new measurement capabilities for doctors but also for insurers, regulators and even patients themselves. This Longevity Bulletin presents a number of theoretical and practical examples on the uses of big data. It also outlines some of the world-class research activities and goes into detail on the challenges from using biomedical data.

Edition 10: Is the tide turning? - Over the last century, life expectancy has increased significantly around the world. However, in recent years, the rate of this improvement appears to have slowed in some countries. The reasons behind this change are still being debated, with new causes potentially emerging, such as the impact of antimicrobial resistance. This bulletin shows that it's crucial the drivers of longevity are better understood in order to improve future longevity forecasts and examines the relationship between health spending and life expectancy.

Edition 11: Technology - Advances in technology bring with them implications for mortality and longevity trends. Developments such as e-cigarettes, community technologies to support self-care, wearables and the Internet of Health Things already have a daily impact on people's health and behaviour. With driverless cars no longer science fiction, and research into extending human life being undertaken, how might the insurance industry respond to disruptive change? This edition of the Longevity Bulletin examines these areas and highlights key issues for consideration as the relationships between society and technology continue to evolve.