Institute and Faculty of Actuaries

Independent thinking from the IFoA

December 2025

think

Prioritising prevention: Investing for population health

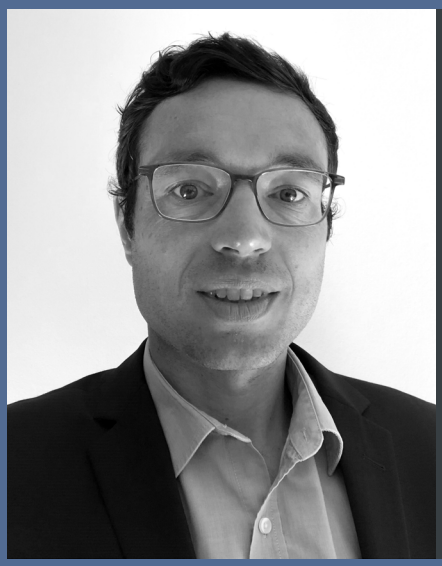
by **David Beddows**

Independent thinking from the IFoA

Part of the IFoA's purpose is to promote debate within and beyond the profession, and to position our members as leading voices on the biggest public policy challenges of our time.

We aim to showcase the diverse range of expertise and critical thinking both within and outside the profession.

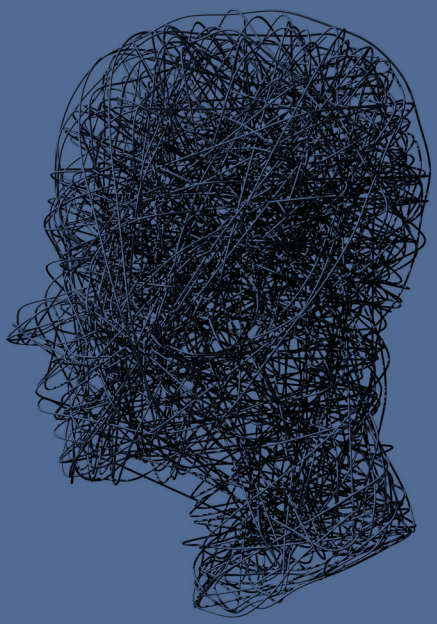
Our 'think' series seeks to promote debate on topics across the spectrum of actuarial work, providing a platform for members and stakeholders alike and sharing views that may differ from the IFoA's house view. In doing this, we hope to challenge the status quo, question the orthodoxy, and shine a light on complex or under-examined issues, thereby stimulating discussion and dialogue to help tackle issues in a different way.



David Beddows

David Beddows, FIA, C.Act, is a senior pricing actuary for a global life and health reinsurer. He has been passionate about exploring the applications of actuarial science within health system financing ever since he co-designed and led financing workstreams within a national population health management development programme. To take this interest forwards within the IFoA community, he co-founded the Population Health Management Working Party and joined the Health and Care Research Sub-Committee, which he currently chairs. Additionally, he sits on the IFoA Health and Care Board and was previously an examiner for the IFoA's Health and Care subjects.

Contents



think

Introduction

Ongoing evolution of the NHS 'from treatment to prevention'

Five months have passed since the publication of the UK government's 10 Year Health Plan for England, and only a week since its Budget 2025, which set out a number of new funding decisions for England's health system. These include plans for new Neighbourhood Health Centres to improve patient access to care[1]. These latest announcements mark the next steps in the ongoing implementation of the plan and the evolution of England's health service 'from treatment to prevention'[2].

The Institute and Faculty of Actuaries (IFoA) welcomed the opportunity to contribute to this plan through its response to the NHS Change Consultation one year ago. That consultation sought views on how to design a plan that is both affordable and sustainable. In its response, the IFoA emphasised the importance of taking a long-term, data-driven view of health financing – a perspective that sits at the heart of actuarial practice.

This paper builds on that perspective to examine how the new plan – and the financial frameworks that underpin it – can support a culture of investing for prevention and population health.

A more actuarial approach to health funding

For the first time, a national health strategy for England explicitly proposes that the NHS should pursue "a more actuarial approach to health funding"[2].

> "Supported by better data and a more sophisticated understanding of lifetime health risk, the NHS will allocate its funding more innovatively, to better maximise return. That is, we will be able to take **a more actuarial approach to health funding**, using anonymised health-care data to maximise healthy life expectancy by making predictions about future disease burdens and outcomes."

While actuaries have contributed to public health initiatives throughout history, their involvement in national health systems has traditionally been limited, compared to their influence in private health insurance. That is now changing. Two trends are converging to make actuarial techniques more relevant than ever to public healthcare:

1. **Technological transformation:** The widespread digitisation and digitalisation of health records and advances in analytics, including AI, now allow population-level insights that were once unimaginable. Linked administrative datasets, covering tens of millions of individuals, enable the calculation of expected cost-per-head for defined population segments based on future health risk – a cornerstone of actuarial work in insurance, now feasible within public systems.

2. **Policy transformation:** Health services are increasingly described as integrated systems rather than isolated institutions. Population health management, partnership working, and system-wide accountability have become core principles of the NHS in England in recent years, albeit the level of practical implementation varies a lot across England. These developments demand analytical frameworks that can quantify long-term costs, benefits, and risks across multiple organisations – precisely where actuarial science excels.

We will be able to take a more actuarial approach to health funding, using anonymised health-care data.

think

A new financial framework for prevention

Aligned with the 10 Year Health Plan's ambition to move 'from treatment to prevention', this paper explores elements of the financial architecture that can make this ambition real, pulling out specific initiatives introduced in the plan. It is organised around three main themes:

Collaboration

How integrated care boards (ICBs) can incentivise their constituent organisations to work together and use integrated financial frameworks to invest collectively in initiatives with shared benefits.

Future prospects – long-term financial planning

How multi-year settlements, robust projections, and appropriate metrics can ensure sustainability over a decade.

Ringfencing funding

How to protect and redirect resources toward preventative services, enabling the system to invest for long-term health gain.

Taken together, these themes support the proposition that investing in prevention is both good economics and good ethics.

Collaboration: The cross-sectional view of health system financing

Incentivising organisations to work together

People's journeys through the NHS rarely follow the boundaries of organisational charts. A single episode of care may involve a GP consultation, diagnostic tests, a hospital stay, community rehabilitation, and perhaps ongoing social care. Each of these interactions may be funded, managed, and accounted for by separate organisations.

Today's NHS operates with a mix of funding mechanisms and these partially reflect organisational silos. Hospital trusts often work under contracts agreed with their integrated care board (ICB), sometimes on a fee-for-service basis tied to the **national tariff**, or on **block payments**, which offer greater income stability for that organisation. Mental health and community providers are also typically funded through block contracts. On the other hand, GP practices receive a blend of **capitated payments** (based on the Carr-Hill formula) and performance-linked service payments.

Each organisation must remain solvent, comply with governance rules, and balance short-term obligations with long-term sustainability. However, this necessary focus on financial viability at the organisation-level can discourage system-wide thinking. As the NHS Confederation has noted, "Financial flows within the NHS are fragmented and work against integration… the system does not allow all partners within an Integrated Care System (ICS) to benefit from returns on investments in another part of the system" [3].

The 10 Year Health Plan acknowledges this challenge and aims to improve the integration of these services. To achieve this, **financial frameworks must incentivise collaboration**. Funding and contracting mechanisms – whether for a GP practice, a hospital trust, or a community provider – should align financial decision-making with collective health outcomes, not institutional performance.

Initiative 1: Year-of-care payments: Incentivising neighbourhood health

A central reform proposed in the 10 Year Health Plan is the new neighbourhood health services to be funded on **year-of-care payment (YCP)** model. The intention is to shift the focus to health outcomes and incentivise local health systems to keep patients out of hospital [4].

YCPs assign an expected annual cost for all the health services required by an average person within a defined patient cohort – similar to the cost-per-head concept in medical insurance. This approach aims to align service providers' incentives around proactive, coordinated, and preventative care. It does so by providing funding that is agnostic to the site of service, rather than providing separate funding flows to, for example, hospitals versus GPs versus community health providers.

This paper proposes that the successful implementation of YCPs would depend on:

- **Clear and standardised definitions of patient segments** and **care pathways**
- **Comprehensive data linkage** across hospitals, primary care, mental health, community services, and social care
- **Robust costing methods**, using national tariffs where available and local cost estimation where not.

Advanced ICSs have already begun linking person-level datasets that combine demographics, clinical characteristics, and service costs. These linked datasets are the foundation for fair, transparent, and locally tailored YCPs. In less data-mature systems, aggregated datasets can provide interim solutions, provided that common segmentation variables are agreed across organisations.

Key enabler: Multi-disciplinary collaboration and professional development

Pooling financial resources and implementing population-based payment models require new capabilities across NHS organisations. Finance teams, analysts, data scientists and clinicians must work together within multi-disciplinary teams that blend financial rigour with clinical insight.

This paper proposes that key priorities should include:

- Investing in training and professional development to enhance understanding of analytics, modelling, and long-term financial planning
- Raising the profile of analytical, financial and actuarial expertise within the NHS
- Embedding data literacy and AI awareness into clinical training pathways
- Strengthening partnerships with professional bodies such as the IFoA to build capacity in applied health analytics and risk modelling.

These measures will help NHS leaders make informed, evidence-based decisions about investment and resource allocation.

Key enabler: Data and technology – a foundation of collaboration

Achieving true financial and operational integration depends on linked, high-quality data across all parts of the health and care system. Shared, anonymised, person-level datasets enable each ICS to develop a single source of truth for its population – linking clinical outcomes, service activity, and costs.

This paper proposes that specific enablers include:

- Secure, interoperable data platforms compliant with the highest information-governance standards
- Consistent data definitions and formats to facilitate sharing and benchmarking
- Use of AI to translate unstructured data into structured data
- Use of advanced analytics to transform structured data into actionable intelligence.

The NHS holds one of the most comprehensive health datasets in the world. Used responsibly and collaboratively, it represents a national asset capable of transforming how we plan, deliver, and finance healthcare.

Key enabler: Ethical data use and governance

With great data power comes great responsibility. The IFoA and other professional bodies have highlighted the need for robust **ethical standards and regulation**[5] for professionals working with health data – whether actuaries, analysts, or data scientists.

This paper proposes that data frameworks should ensure:

- Data is used only for legitimate operational, planning, or research purposes
- Technology providers do not gain monopolistic control over NHS data systems
- Strong oversight of data privacy including patients' consent and privacy being respected, ensuring public trust
- The benefits of data use are transparently shared with the public. NHS patient data is to be considered as a public good.

Such safeguards will allow innovation to flourish while maintaining public confidence in how personal health information is managed.

With great data power comes great responsibility. The IFoA and other professional bodies have highlighted the need for robust ethical standards and regulation[6].

Future prospects: The longitudinal view of health system financing

Treating health as a form of public capital

The 10 Year Health Plan rightly recognises that the health system must look beyond the next financial year, promising "a shift to long-term financial planning."[2]. Managing finances over a multi-year timeframe – rather than engaging in year-to-year firefighting – is essential to achieve a better allocation of resources and build a financially sustainable NHS.

This evolution aligns closely with the principles of actuarial science – using data, forecasting, and risk management to guide decisions with long-term impact. The focus on moving to longer-term financial arrangements resonates with many commentators. As the Institute and Faculty of Actuaries (IFoA) observed in its response to the NHS Change Consultation[6] the shift toward multi-year planning is essential. Long-term planning should become a living process, not a static one. Updating the 10 Year Health Plan should be a routine annual exercise, assessing progress and allowing the system to adapt as demographics, health needs, and economic conditions evolve.

Initiative 2: Multi-year financial settlements

Let's discuss the specific actions proposed by the 10 Year Health Plan. The plan proposes:

> "This Plan signals a shift to a new longer-term mindset, alongside a 3-year revenue and 4-year capital settlement from financial year 2026 to 2027 in the spending review. While we recognise the financial pressures on the NHS, this new long-term approach provides the opportunity to take a strategic approach to planning health services. To break the old, short-term cycle we will ask all organisations to prepare robust and realistic 5-year plans and demonstrate how financial sustainability will be secured over the medium term."

Multi-year frameworks provide stability, enabling organisations to plan for the future and to invest in preventative and transformational services that yield benefits over time. However, the challenge remains clear: how to incentivise NHS organisations to spend today on projects whose positive outcomes may not be visible for several years, or even several funding cycles. Overcoming this requires explicit incentives that make such long-term investments compelling both from a health and financial perspective.

Key enabler: Developing data-driven projections with financial credibility

High-quality long-term planning depends on robust data. To create credible five- or 10-year financial projections, ICSs must draw on detailed activity and cost data from all provider organisations. The same datasets used to develop year-of-care payments (YCPs) can underpin these projections, offering consistency between short-term payments and long-term financial outlooks. Importantly, they can also be harnessed to understand the relationships between health outcomes, service use, and costs across population segments **over time**.

Long-term projections should estimate expected future costs of health services by population segment and across providers, incorporating key drivers such as:

- **Demographic change:** Population growth, ageing, birth rates and regional migration patterns
- **Health trends:** Disease incidence and prevalence, risk factors and morbidity rates
- **Service use:** Activity levels across NHS service units and care pathways
- **Economic assumptions:** Workforce expenses, medications costs and inflation.

To be credible, assumptions must be auditable, evidence-based, and applied consistently across all ICSs. At the same time, local flexibility is vital – allowing for the particular demographic and health characteristics of each region. Achieving the optimal balance of national consistency and local refinement is vital. Where data gaps exist, expert judgment must be applied consistently and transparently.

Sensitivity testing of key assumptions and scenario testing of plausible combinations of events should be integrated into the process. This exploration generates enhanced understanding of the implications of ageing populations, chronic disease prevalence, and changes in social and economic conditions. Continuous monitoring against defined metrics – combined with regular review of assumptions – ensures the plan remains credible, relevant, and grounded in reality.

Long-term projections are not simply to forecast expenditure. Their true purpose is to form a baseline against which the progress of the plan can be monitored and to test the impact of doing things differently. For example, they can highlight how preventative interventions can alter the trajectory of demand for health services. The results of such exercises enable ICSs to make the case for investment in prevention on rigorous financial as well as clinical grounds.

Initiative 3: Incentives linked to population health outcomes

To make the case for long-term planning truly compelling, financial incentives must be aligned with population health outcomes. The 10 Year Health Plan calls for metrics and rewards that reflect genuine improvements in health, not just activity levels or throughput.

Going further, planning frameworks should recognise the wider social and economic value of good health, including:

- Reduced future demand for healthcare and social care services
- Lower future expenditure on welfare and incapacity benefits
- A more productive workforce and stronger economy.

For example, preventative programmes that help working-age adults remain healthy can reduce both sickness absence and reliance on social security. These benefits, while outside the scope of NHS budgets, represent real value to society and should be factored into the financial assessment of new interventions. This principle – treating health as a form of **public capital** – should underpin every financial decision by health system leaders.

Key enabler: Accountability and professional oversight

Long-term planning requires clear accountability for financial and population health risk. ICSs should establish specialist teams responsible for modelling and managing long-term risk, reporting to the integrated care board (ICB).

Strong decision-making frameworks are needed to manage financial risk across ICS organisations. This requires ongoing development of skillsets in data analytics, scenario modelling, and long-range financial planning – skills that blend actuarial, financial, epidemiological and clinical expertise. These frameworks would ensure that projections, assumptions, and datasets meet professional standards of accuracy, rigour and transparency – mirroring the governance frameworks that underpin actuarial work in other sectors.

This paper proposes that specific enablers must include:

- **Transparency and accountability:** Establishing clear reporting requirements at both ICB and national levels
- **Leadership and skills:** Empowering finance and data teams with the analytical capability to model long-term impact and make the business case for investing in prevention.

Embedding these capabilities will allow ICSs to understand not only the present state of their populations but also the future trajectory of health and cost, empowering them to make informed, strategic investments in prevention and service transformation.

To make the case for long-term planning truly compelling, financial incentives must be aligned with population health outcomes.

Ringfencing and reallocating: Prioritising investing in prevention

A Long-term investment in the nation's health

The NHS commits to being a health service that is **comprehensive, available to all, based on clinical need, publicly funded, and largely free at the point of need**[7]. Yet these principles face growing strain. Rising demand, constrained public finances, and increasing operational pressures create a daily tension between funding today's services and investing in tomorrow's health. To sustain the NHS's promise for future generations, we must **protect part of our resources for prevention** – for the upstream interventions that keep people healthy and reduce the need for costly acute care later.

Ringfencing and reallocating budgets are more than technical adjustments. They demonstrate a **strategic shift** in how the NHS views its role. By protecting a portion of its budgets for prevention and transformation, the NHS sends a powerful signal: that **the best way to safeguard the health service is to reduce the need for it.**

Initiative 4: Ringfencing ICS budgets for preventative health

The case for ringfencing prevention funding is compelling. The plan recognises this[2]:

> "the share of the NHS budget spent on prevention has effectively been cut **by 28% per person in real terms over the past decade,** despite the significant rise in long-term and chronic illness **making prevention even more important to both population health and NHS financial sustainability"**

The **Hewitt Review (2023)** and other expert commentaries have argued strongly for reversing this trend. The review recommended that each **Integrated Care System (ICS)** should increase the proportion of its NHS budget allocated to prevention **"by at least 1% over the next 5 years"**[8]– creating protection for investing in prevention.

It is welcome that the 10 Year Health Plan recognises this issue and offers a solution. This marks a crucial policy shift: one that explicitly protects a larger share of resources for long-term improvements, even when operational pressures are acute[2]:

> "Over time, we will require **all organisations to reserve at least 3% of annual spend for one-time investments in service transformation.** This might include pump priming transformation or change management. Too often, positive change is not pursued because of a lack of transformation funding to get it off the ground."

For NHS finance directors, the challenge is well understood: how to justify funding projects whose benefits may not materialise for years, when day-to-day pressures demand immediate solutions. Ringfencing funds for prevention provides both the **authority and the accountability** to make these decisions with confidence.

In practice, this could mean:

- Redirecting a portion of funds previously earmarked for acute care toward **community-based interventions**
- Allocating transformation budgets to **early detection, behavioural health, and lifestyle support programmes.**

think

Key enabler: Defining, measuring and monitoring the right metrics

To make ringfencing and reallocation effective, systems must apply **standardised definitions of health status and health outcomes,** ensuring consistency across regions and over time. They must employ **robust mechanisms for measuring, monitoring, and reporting outcomes** of the impacts of the projects funded by these budgets. Implementing the right metrics for monitoring ringfenced budgets is fundamental to aligning financial planning with population health and thereby justifying the budget allocation.

This paper proposes that key metrics should include:

- **Healthy life expectancy**
- **Healthy working life expectancy**
- **Transition rates between clearly defined population health segments** – for example, from overweight to obese, and vice versa.

By analysing 'health transition rates' – the rates at which people move between states of wellness and illness – ICSs can understand more deeply how their populations and their health needs will evolve and so make better decisions about prioritising specific interventions for their local population. Linking additional datasets such as employment data could lead to further insights regarding correlations between health status and economic activity.

Advanced demographic and scenario modelling, as described in the previous section, can project how these indicators evolve under different prevention initiatives, supporting evidence-based decisions and allowing progress to be tracked transparently.

Ringfencing budgets for investing in prevention is not merely a financial mechanism. It is a **leadership commitment** to prioritise health creation alongside healthcare services delivery.

To make ringfencing and reallocation effective, systems must apply standardised definitions of health status and health outcomes.

Conclusions: Harnessing analytical excellence for health system financing

Investing for population health

The ongoing implementation of the 10 Year Health Plan, along with the trends of policy and technological advancements, present a growing opportunity to align analytical and actuarial expertise with the ambitions of health system financing for integrated care boards across England.

ICBs must use their powers to align resources across their local systems, encouraging joint investment to deliver shared benefits to population health. ICBs should allocate funding to initiatives that promise the **greatest overall improvement in population health,** even when the benefits are long-term or preventative.

This requires a **collaborative, cross-sectional, system-wide financial perspective and a forward-looking, longitudinal analytical approach** to anticipate future scenarios of demand and costs. It means using the opportunity to **ringfence funding for preventative activities.**

Actuaries, with their expertise in forecasting, scenario analysis, and long-term modelling, can play a role as part of **multi-disciplinary teams** – working alongside data scientists, clinicians, health economists, and public health professionals.

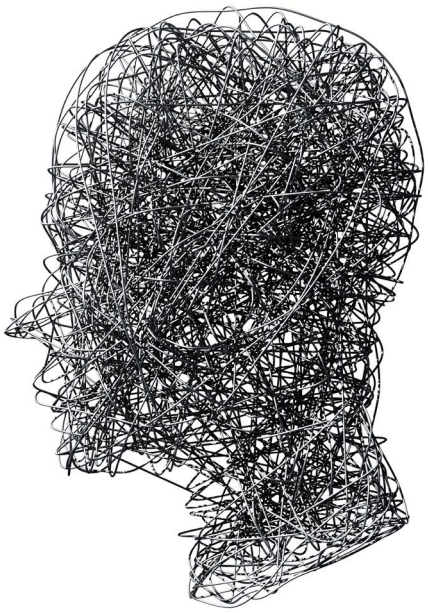
The role of the IFoA

Actuaries are trained to **assess financial risk and project long-term outcomes.** They must consider the impacts of decisions for different groups of people, balancing short-term and long-term interests, including inter-generational fairness. These skills and approaches are highly relevant to population health management and health system financing. Yet relatively few actuaries work within or alongside the NHS or public health organisations.

To change this, the IFoA can:

- Facilitate further **research and thought leadership** into actuarial applications for population health, care financing, and preventative health investment
- Consider ways to make **public health and health economics** topics more prominent in members' professional development and qualification journeys
- Support members to **pursue roles and partnerships** within NHS and public health organisations
- Encourage collaboration between actuaries and their employers – consultancies, insurers, and reinsurers – to **explore proposals** that support population health management and promote the financial sustainability of public health systems.

Through these steps, actuarial expertise can become a strategic partner in shaping the future of health system financing and investing for population health.

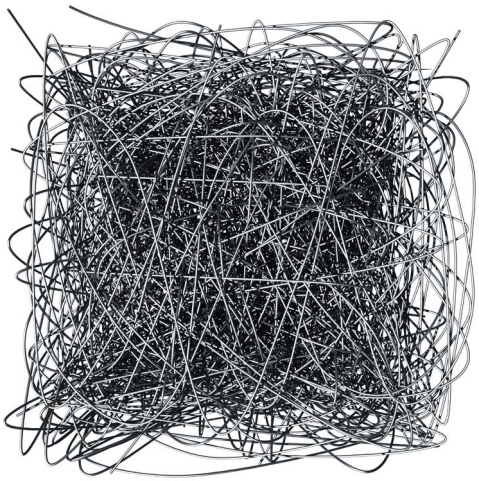


Actuaries are trained to assess financial risk and project long-term outcomes.

think

References

1. UK Government, November 2025: **Budget 2025 document - GOV.UK**
2. UK Government, July 2025: **Fit for the future: 10 Year Health Plan for England**
3. NHS Confederation: Unlocking reform and financial sustainability: NHS payment mechanisms for the integrated care age, March 2024: **Improving health and care at scale**
4. The Health Foundation, July 2025: **The heavy lifting on NHS financial reform is still to come - The Health Foundation**
5. IFoA Ethical and professional guidance on Data Science: A Guide for Members, February 2021: **Data Science Ethics**
6. IFoA response to DHSC Change NHS Consultation, December 2024: **ifoa_response_to_dhsc_change_nhs_consultation.pdf**
7. NHS: The NHS Constitution for England, August 2023: **The NHS Constitution for England - GOV.UK**
8. The Hewitt Review: An independent review of integrated care systems, April 2023: **The Hewitt Review: an independent review of integrated care systems - GOV.UK**



think

Institute and Faculty of Actuaries

Independent thinking from the IFoA **December 2025**

Acknowledgements and Disclaimer:

The author wishes to express immense gratitude to members of the IFoA Population Health Management Working Party for the many stimulating and constructive conversations that led to the creation of this 'Think' Piece. Additional thanks to those members who provided critical review of earlier drafts. For the avoidance of doubt, the opinions expressed in this paper are the personal views of the author and do not necessarily reflect the views of those members, or any other organisation associated with the author.

Beijing
Room 512 · 5/F Block A · Landgentbldg Center · No. 20 East Middle 3rd Ring Road
Chaoyang District · Beijing 100022 · People's Republic of China
Tel: +86 10 6611 6828
Email: China@actuaries.org.uk

Edinburgh
Spaces · One Lochrin Square · 92 Fountainbridge · Edinburgh · EH3 9QA
Tel: +44 (0) 207 632 2100

London (registered office)
1-3 Staple Inn Hall · High Holborn · London · WC1V 7QJ
Tel: +44 (0) 207 632 2100

Malaysia
Arcc Spaces · Level 30 · Vancouver Suite · The Gardens North Tower
Lingkaran Syed Putra · 59200 · Kuala Lumpur
Tel: +60 12 591 3032

Oxford
Belsyre Court · 1st Floor · 57 Woodstock Road · Oxford · OX2 6HJ
Tel: +44 (0) 207 632 2100

Singapore
Spaces · One Raffles Place Mall · #02-01 · Singapore 048616
Tel: +65 8778 1784

actuaries.org.uk