

# A Learning Society

Louise Pryor, IFoA President, 25 June 2021

## Introduction

Hello and welcome to you all, wherever you are and whenever you are watching this. Although it's a shame in some ways that we can't be together in Staple Inn, the upside of being online is that so many people from around the world are able to be here. And although I can't see you, I'm pleased that many colleagues, friends, and family have been able to make it.

It's an enormous honour to be chosen as President of the IFoA, an organisation with a long history, a global reach, and an ambitious strategy. Over the past year I've had the pleasure of working on the Presidential Team with John Taylor and Tan Suee Chieh as the executive have started to deliver Council's strategy for 2020-24. I look forward to working with Tan Suee Chieh and Matt Saker over the next year as we continue this work.

There's a widespread view that we are living in a period of great change. Indeed, this has been a theme of many recent Presidents in their Addresses. Today, I'm going to give you my perspective on that theme, and argue that, in order to survive and be sustainable, we as actuaries and the IFoA as an organisation must keep learning.

Last year, in his address, Tan Suee Chieh argued that we should revive the spirit of a learned society and bring thought leadership to the foreground. I believe that in order to do that, and indeed in order to implement the IFoA's strategy of supporting our members to adapt to change in their existing fields of work, as well as moving into wider fields, we also need to be a learning society.

I asked some actuarial friends what they consider have been the major changes over their careers. Here's a selection of their responses.



Many thanks to Kalpana, Chantal, Charles, Ross, Evelyn, Trevor, Lucy, and Mukami. Many of the points they make chime with my own experience.

Although the IFoA in its current form dates only from 2010, it has a long history. It's the result of a merger between the Institute of Actuaries, founded in England in 1847, and the Faculty of Actuaries, founded in Scotland in 1856.

There were 70 presidents of the Institute, 60 of the Faculty, and I'm the 12<sup>th</sup> president of the IFoA. Allowing for repeat offenders, that makes me the 139<sup>th</sup> president in all. I don't have detailed information, but without doubt nearly all the 138 previous presidents worked in either life insurance or pensions. Twelve of them have been called John, and eleven William, but I'm only the fourth woman and only two presidents have been based outside the UK. It hasn't been a very diverse group.

I am thus atypical. In fact, I'm atypical in several ways – not only am I a woman, but my career history has been far from standard. So I'll start by describing my career so far, and the changes that have occurred along the way.

### **1981-1988. A traditional actuary**

I became a student of the Institute of Actuaries in 1981. I'd studied maths at university, and was hired as an actuarial analyst by a firm of pension consultants. This was in spite of being advised by the university careers service to become a teacher, which they suggested to all women studying maths, and in spite of being told by a partner of one of the largest consultancies that they had never had a woman qualify with them.

I'm pleased to report that I made rapid progress through the exams. However, I turned out to be fairly unenthusiastic about pensions, so I soon moved employers to start working as a consultant in life insurance.

I finished the exams in 1985, becoming an Associate, and around then moved into general insurance. I became a Fellow in 1987, when I completed the two years of experience that were then required.

Probably the most significant change during this period was the advent of personal computing. When I started out in 1981 we had no PCs. We did use computers for pension fund valuations, and then for modelling life offices, but had to use special terminals to connect to them, and there were no interactive applications such as spreadsheets so all the programming was in Fortran. By the end of the decade spreadsheets were widely used for many routine calculations.

For those of us working in life insurance, other changes were afoot. An increasing proportion of new business was unit linked, rather than with profits, a development that was part of the long-

term transfer of risk from institutions to individuals that we have seen over the last half century. It was also a development that was ignored in the exams.

Also in this period the control cycle, that current exam staple, was introduced to unsuspecting actuaries in a paper to the Students' Society – the precursor of the Staple Inn Actuarial Society.

As well as all the traditional actuarial techniques, I was learning about what went on in practice in the life insurance industry, and then in general insurance. And I was learning a lot about computer programming. Although I'd been programming since my early teens, and had always enjoyed it, this was when it really took hold of me. This was to prove a significant development in the coming years.

### **1988-2002. An undercover actuary**

In 1988 I changed direction rather more radically. I went off to the USA to study for a PhD in Computer Science, specialising in Artificial Intelligence. I loved my five years in grad school. Being a full-time student again, but this time with added time management skills, was enormous fun.

I came back to the UK in 1993, and was a university lecturer for three years before deciding that academia wasn't for me. I went into the software industry, working for start-ups. This was during the dot com boom, and it was an exciting time, if somewhat precarious when the inevitable bust followed the boom.

At the turn of the century I was hired by a start-up analysing financial risk. The technicalities of actuarial work had changed significantly in my absence. The world was full of new terms such as stochastic modelling, Value at Risk, economic scenario generator, asset liability modelling, and option pricing approaches. I did some rapid learning.

Mark to market had also more or less completely taken over. At the end of the 1980s many pensions actuaries had still been using the so-called actuarial value of assets, calculated by discounting future cash flows, but now market values ruled. Another change was the growth of risk management as an explicit skill set. And spreadsheets were by now all-pervasive.

Many of these changes had started in the 80s, but had gathered pace in the 90s. The rate of change was distinctly non-linear. Stochastic modelling, for example, had first been introduced in the context of maturity guarantees in 1980, but only became mainstream ten to fifteen years later.

In the 80s, the adoption of technology had really been about automating existing analyses and speeding them up; in the 90s, we were seeing that automation allowed us to do things we simply hadn't been able to do before.

Email had been ubiquitous in academia in the late 80s – certainly in computer science – and was in general use everywhere else by the end of the 90s. Mobile phones also became mainstream at around this time. And the world wide web was invented in 1989 and was widespread by the end of the 90s.

Importantly for actuaries, Equitable Life ran into problems with its guaranteed annuities, losing a case in the House of Lords in the year 2000. More on that later.

As I've said, for some of this period I was in academia, first as a student and then as faculty, so learning was high on my agenda. I learned a lot more about computer programming and computer science (by no means the same thing) and about software engineering. My time working for start-ups also brought home to me the importance of business models and strategy, and above all the importance of cash flow.

## **2002-2011. A non-traditional actuary**

In 2002 I was made redundant and decided that it was time to get out of the uncertain world of software start-ups. So I moved to the uncertain world of freelancing, and set myself up as a software risk consultant. The idea was that I would consult to actuaries and others about how they used and developed software, with a special emphasis on spreadsheets.

I started networking frantically, and found that the best and by far the most enjoyable way to do it was through the actuarial profession. I went to GIRO and joined working parties, as well as finding my way onto various committees for the Finance and Investment Board and professional standards.

At this time the way the UK actuarial profession was organised was changing. The near collapse of Equitable Life at the turn of the century had led eventually to the Morris Report, which contained some fairly trenchant and widely shared criticisms of actuaries, and recommended that the Financial Reporting Council should oversee the actuarial profession and set technical standards.

In 2007 my domestic circumstances changed, and I moved back down south from Edinburgh, where I'd spent 11 happy years. By then the FRC had established its actuarial function, and when I decided I needed to get a proper job that's where I ended up.

I started out as their general insurance specialist, but then became the Director of Actuarial Standards, leading the team that developed the Technical Actuarial Standards, or TASs. These were among the most interesting and rewarding years of my career. I learned about the full range of actuarial work, as well as about professional regulation. I found that writing standards has many similarities to computer programming – you must always keep the top-level goal in mind, but it's really important to get every tiny detail exactly right. There was also the fun of construction, of building something, which is also true of programming.



It was also an interesting time because the actuarial world was still changing quite rapidly. The main drivers were regulation and the increased availability of processing power and data storage. These combined to fuel the increasing dominance of risk-based capital and internal models for insurers.

Meanwhile, it had become evident that mortality rates in the UK were improving both rapidly and consistently. Actuaries had to change their approach to mortality projections.

It had only been in 1999 that the CMI had first issued any projection factors for mortality rates. Those first factors depended only on age and gender, but in 2002 the CMI introduced a methodology for applying them to different cohorts. The first version of the CMI's stochastic projection model was only issued in 2010.

The reputation of the actuarial profession, which had already suffered as a result of the Equitable crisis and Morris review, was badly hit by this perceived slowness to react. In many circles our name was mud.

Alongside all this the 2008 financial crash changed the landscape, and in 2010 the Institute and the Faculty merged.

## **2012-2021. A sustainability actuary**

In 2012 the FRC completed the initial set of TASs, and I returned to freelancing.

I thought then (and still do) that climate risk is by far the biggest problem facing the world, and wanted to do something to help address it. In 2013 I started to become heavily involved in what grew into the Sustainability Practice Board.

Meanwhile I was considering what freelance work I could do. I knew a fair bit about modelling, was learning fast about climate risk, and was interested in both of them. So that's what I've been doing for the last ten years or so, though I haven't actually managed to combine them yet. The modelling work has mainly been concerned with pensions and social security reform in developing economies, while the climate risk work has mainly been looking at the impacts on insurance.

Along the way I've acquired various other roles, most of which are not specifically actuarial – though I bring my actuarial background to all of them. For a few years I worked with the Centre for Risk Studies at Cambridge, looking at emerging risks. I'm involved in climate change adaptation through the London Climate Change Partnership. I'm involved in sustainability in the built environment as a non-executive Director of the Ecology Building Society and as an Honorary Professor at UCL's Bartlett School of Sustainable Construction.

I also continue to learn about climate risk and sustainability through leading IFoA working parties.

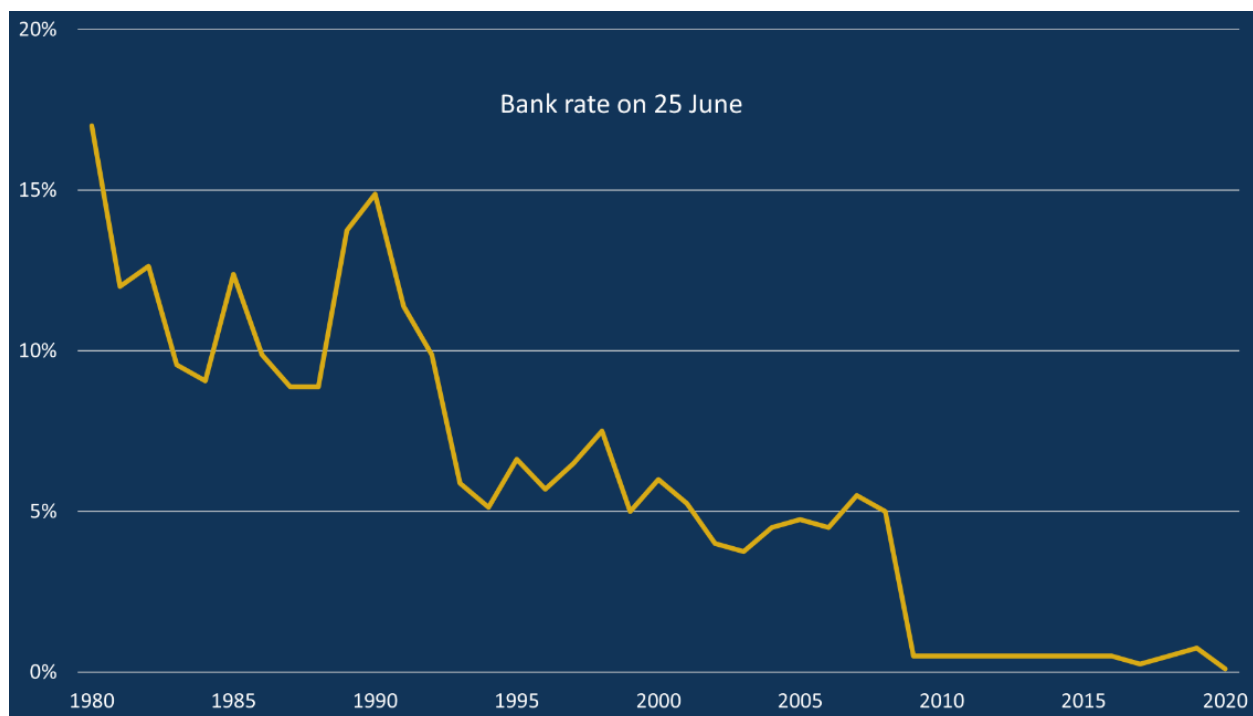
The actuarial world carries on changing. Over the last ten years we've seen data analytics become much more widespread, as computing power and data storage capacity continue to grow. Quantitative risk and capital modelling are more dominant than ever. And a number of risks have newly emerged as significant, including cyber and pandemic risk. The consideration of climate risk has become mainstream and even mandated by regulators in many countries.

Social media and blogs provide new ways of disseminating information. Video conferencing enables us to work with people regardless of their physical location, although time differences still cause problems. Meetings at 3 in the morning are no fun for anyone!

In the last 18 months Covid-19 has accelerated ongoing changes and driven the introduction of new ones. The IFoA moved all its events and exams online in April 2020. We've developed new ways of working with volunteers, through our Covid-19 Action Taskforce, or ICAT, which at its peak had around 90 workstreams and 500 volunteers.

## Change

I've seen huge changes over my career.



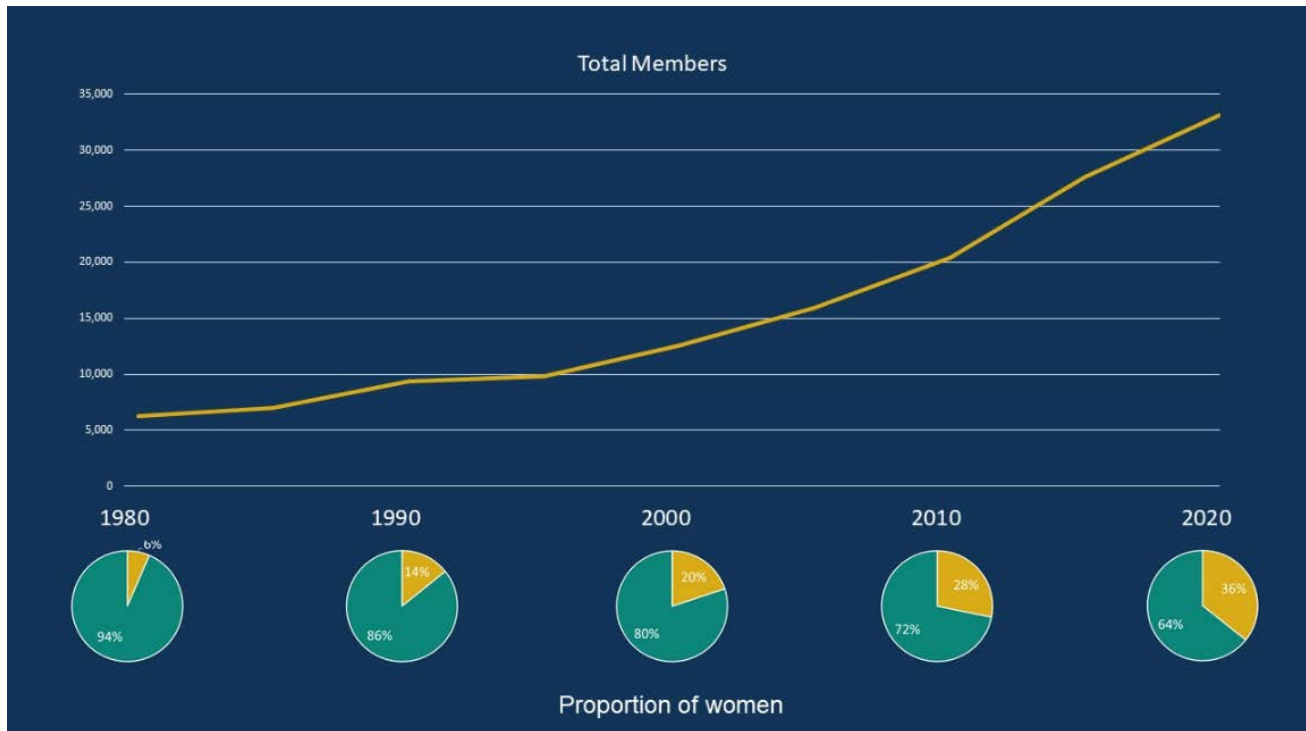
Interest rates are at the heart of much actuarial work. In the 1980s they were both high and volatile, ranging between 9% and 15%. Since 2008 they've been low and stable, staying under 1% for over 12 years now.

There's been a transfer of risk from institutions to individuals, exemplified by the growth of unit linked life insurance and defined contribution pensions in the UK.

There are new types of risk, such as climate risk, that simply weren't on the horizon 40 years ago.

And our techniques and models are much more sophisticated than they used to be.

There've been major changes in the IFoA, too.



It's grown – we now have over 33,000 members compared to 6,000 in 1981. In 1981 only 6% of us were women – now it's 36%. When I became a student in 1981 there were under 300 other women students. In 1985 I became one of only around 60 women Associates. And in 1987 I joined a select group of under 100 women Fellows of the Institute. There are now well over 4,000.

We now have a single professional body in the UK instead of two, and many more of our members are based outside the UK. The organisation has had to learn how to operate on a completely different scale. It's had to learn how to do new things and use new tools, such as the web and social media.

All these changes mean that those of us who've been in the profession for longer than three or four years have had to learn new skills since we started. We can't operate in today's world using yesterday's skill set.

## Learning

I asked some actuarial friends what they've learned over the course of their careers. Here are some of their responses.



Thanks to Dan, Karen, Darshan, Angharad, Pun, Rath, Kelvin, and Kathryn for their insights.

This learning process, both individual and organisational, must continue and pick up pace if we are to remain relevant in the 21st century. One of the three key themes of the IFoA's strategy for 2020-2024 is centred on supporting members by developing their skills so they can adapt to change in their current fields of work as well as moving into wider sectors. It's all about learning.

A major plank supporting the 2020 strategy is the Learning Change Programme, which aims to modernise, deepen and broaden the IFoA's actuarial qualifications and lifelong learning support.

When I took the exams all those years ago there seemed to be a disconnect between the actuarial exams and what I spent my time doing in practice. Much of the exam content seemed to be a possibly pointless intellectual exercise – I may be exaggerating here, but not by much. This has always been a problem for the profession: how to keep exam syllabuses up to date and relevant, while not making life difficult for the students by changing them too quickly or getting carried away by short-lived fads.

The Learning Change Programme is currently reviewing the pre-Associateship syllabus to ensure the curriculum reflects the needs of the IFoA's students and their actual and potential employers. Some of the changes that will appear in the 2022 exams include more emphasis on both sustainability and banking – new skills and new fields of work.

The second strand of the programme is the development of a broader portfolio of routes to Fellowship. The first change from this strand will be the introduction of Fellowship exams on banking, which we are hoping to offer from 2022. Other possibilities that are being considered include data science and possibly sustainability.

The third strand is around assessment methods. Over the last year, spurred by Covid-19, the IFoA has moved from paper-based closed book exams to online open book exams. This is a fantastic achievement and is the result of much hard work under intense time pressure from both executive and members. In the next couple of years we are planning to provide wider access to all our students by moving to a new exam delivery system.

The final strand of the Learning Change Programme, which is central to the whole endeavour, is lifelong learning. I've already discussed why lifelong learning is so vital. Of course the exams are important, but changing them affects only those who are still taking them. There are currently over 15,000 Fellows and Associates who can't rely only on the skills that were tested when they took the exams towards the beginning of their careers. We already have an extensive range of events put on by the Practice Boards and Member Interest Groups, and the programme is looking at how else our members can be supported.

For example, there are two new lifelong learning microsites on the IFoA website, on Banking and Sustainability. The sustainability microsite includes a really useful and extensive annotated reading list, and there's also a series of practical guides to climate risk for actuaries working in a range of practice areas.

There are new credentials, too. In 2019 we introduced the Certificate in Data Science, which now has over 330 graduates. Work on a credential in climate risk is well developed, with a pilot programme currently underway. If it's successful, we're hoping to be able to offer the full credential later this year.

The Learning Change Programme isn't the only activity in the IFoA that's supporting continued learning by our members. For instance, a new CPD scheme was introduced last year which encourages us to take responsibility for our own learning needs, rather than simply ticking off the required number of hours.

And there's a lot of learning going on. I asked some of my actuarial friends what they're currently learning, and here are some of their replies.



Thanks to Agrotosh, Cynthia, Chika, John, Nick, Laura, Catriona, and Wendy, who are learning about such interesting topics.

## Current changes

I've already described some of the changes that have occurred over the last 40 years. But change is continuous and still affecting actuaries and the IFoA.

Technological change, driven by the growth of computing power, is clearly important as it expands the techniques that are available to us. A number of our colleagues are specialising in data science, where there are enormous opportunities for people who can both understand the technical aspects and relate the models to the business world – people who understand that models are tools not oracles.

Technological change is also a driver of the explosion in communication channels that has occurred over the past 40 years. First fax took over from telex, then email and the web appeared, then texts, and now we have social media, instant messaging and video calls.

The IFoA is learning to embrace video conferencing, allowing many more of our members to participate in working groups and attend online events. The Covid-19 Actuaries' Response Group has made excellent use of social media and online resources and to build a reputation for timely and informed comment both inside and outside the profession.

We hope that some of these new technologies will support us in providing different ways for our members to connect with each other and with the wider world – for example, we're currently

operating pilot online digital communities for banking and data science, and hope to be able start more in the coming months.

Societal changes are equally important. Both diversity and sustainability risks have moved from the fringe to the mainstream, and it is to them that I now turn.

## Diversity

Society is placing a growing emphasis on diversity. This is very welcome. For too long we've drawn comfort from being surrounded by people like us and have failed to recognise the benefits that diversity brings.

I've already illustrated the growing proportion of women in the IFoA over the last 40 years, but it has been a slow growth.



Half the current women Fellows have qualified since 2012, but only a third of the men.

Ten years ago 37% of our students were women – now it's still only 42%. And even now under 30% of our Fellows are women.

However, this is only one aspect of diversity. I've focused on it partly because it affects me directly – there are only around 50 women from my generation or earlier – and partly because we do have some statistics in the area.

We also have statistics on how many of our members are based in the UK, but we have very few on other aspects of diversity. We're a profession founded on data, and we have a big gap in this area. This must change.

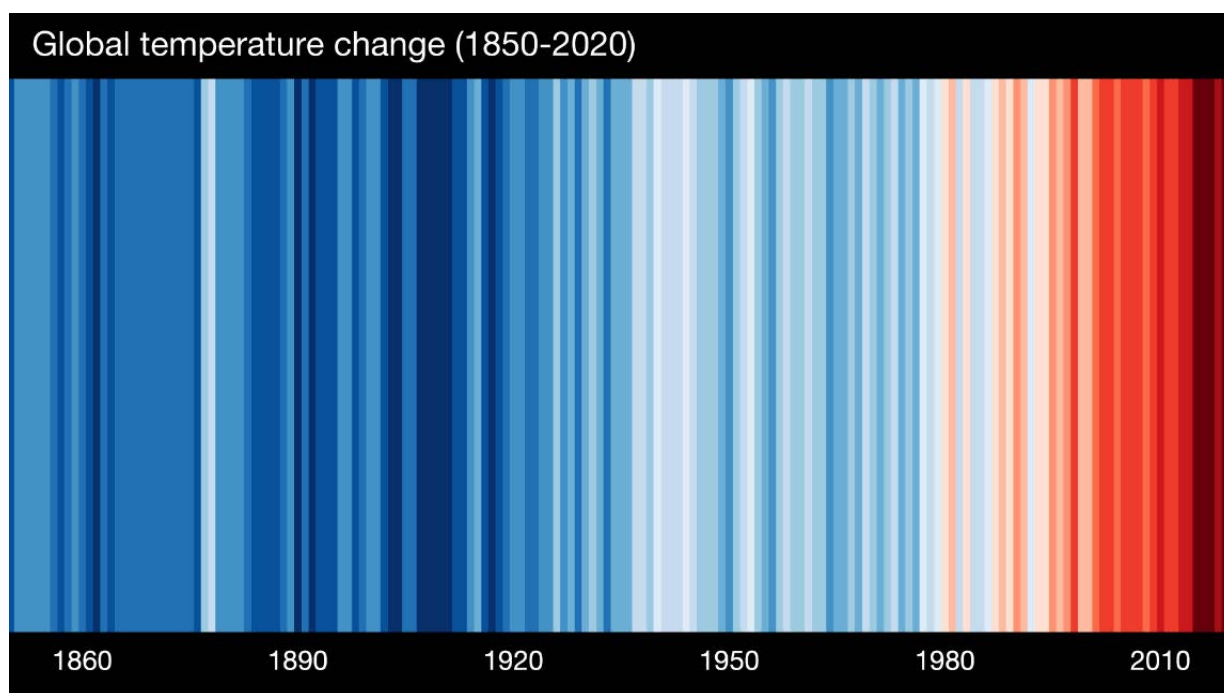
We need to do more to increase diversity within the profession so that we can tap into the full potential that is available to us. Not only do we need to work with employers and universities to ensure there are no unintended barriers to entry, but we also need to make sure that we're supporting people from all backgrounds throughout their careers.

We've made a good start by removing formal entry requirements, and the Learning Change Programme will help to ensure that our qualification structure focuses on the competencies that are required to be an actuary today and in the future, rather than on past experience.

Our Diversity Action Group is helping us to move to a position where the IFoA offers all members the support they need and the volunteering opportunities they deserve, but there is much work still to do.

## **Sustainability risks**

Over the last few years, climate change has become increasingly visible as a source of risk, and biodiversity is starting to become visible too.



But it's important to realise that climate change itself isn't a risk, it's a certainty. Climate change and biodiversity loss are both happening and are both being driven by human behaviour.

The risks are posed by the impacts of these changes. For example, potential impacts of climate change include severe weather events such as floods and droughts, mass migration, civil unrest and many others. They also include changes to consumer demand, business models, the financial system, the economy, and regulations, all of which will directly affect actuaries and the users of their work. The impacts of climate change pose long term risks with significant financial effects. They go to the heart of what we do.



These climate stripes act as a reminder that ignoring it doesn't make climate change go away. So I'm going to keep them visible for the rest of this talk.

However, sustainability risks are in many ways quite different from the other risks that actuaries traditionally deal with, because of the deep uncertainty involved. There are intrinsic limits to predictability in complex systems, and we are certainly dealing with very complex systems here.

Sustainability risks aren't repeatable – they can't happen over and over again. Instead, they're chronic and long lasting. Their impacts are systemic, wide ranging, and may include fundamental changes to the economic and financial systems. We don't have direct historic data on the impacts, because climate change and biodiversity loss to this extent simply haven't happened in recent human history. We can't derive probability distributions for them.

Moreover, the impacts of sustainability risks are irreversible. It's not possible to recover from them and return to the past position: nonlinearity and the existence of tipping points mean that there's no going back. We can't restore species that have gone extinct, and we can't re-freeze icecaps that have melted within any reasonable timescales.

All these characteristics mean that we don't know how to calculate the cost of these impacts. What's the monetary value of a fundamental change in how our world operates?

So there's a major risk management challenge: how can these risks be managed? And they must be managed at many different levels. We must manage them at the global and societal levels, but insurers, pension schemes and other organisations have to manage them, too. And global systemic risks like this can't be hedged.

But what has this all got to do with actuaries? And learning?

As you might have guessed, the answer is "a lot" in both cases.

First, climate change poses significant financial risks to insurers and pension schemes, our traditional employers and clients. We'll be letting them down if we ignore those risks. Which means, of course, that we must learn about them and about their potential impacts. If we don't, we'll lose all credibility as a risk management profession.

Second, addressing this major societal risk management challenge requires new skills. This is a once in a lifetime opportunity for actuaries to use our unique insights, evolve our expertise and collaborate with other experts to help provide the new paradigms and methodologies that are needed. And we have a head start, as actuaries are currently very active in this area in the insurance industry. But the skills are needed everywhere, especially in banking where climate related risks are near the top of the agenda for the regulators in the UK and indeed globally.

And we need to up our game. We can't rely only on quantitative methods of assessment, for example, but will have to develop and extend our use of more qualitative methods such as scenarios and narratives. We'll also need to make sure our models take account of the significant structural change that'll affect the economic and financial systems.

We also need to recognise that climate related risks can't be seen in isolation from other risks – they arise from the complexity of the overall ecological, social and economics system that we live in, so we must make more use of systems thinking techniques. We can only address the problems posed by climate change if we recognise their interactions with the diversity of human experience, and with both global and local inequalities.

Society must find a just transition to a low carbon world that supports society and biodiversity, one that seeks to ensure that the substantial benefits are shared widely while also supporting those who stand to lose economically. This is a very actuarial problem. Actuaries have been thinking about fairness and balancing the interests of different groups of people along varying timescales for nearly two centuries.

So yes, it's a huge challenge, but it's also a major opportunity. If we ignore it, we'll fast become irrelevant, side-lined as one of those quaint historic professions with no place in the world of the future. If we embrace it, we can help to lead society's efforts to create a better world.

Last year the IFoA Council endorsed the report of its Climate-Related Risks Taskforce, which has resulted in a major programme of work to ensure that IFoA members are equipped to deal with these challenges. All actuaries should be considering climate risk and other sustainability risks in the same way as they consider other major risks such as interest rates and mortality. The Practice Boards have all developed engagement plans to raise awareness of how climate risk affects established areas of actuarial work and to provide support to their communities.

There are also several other groups who are addressing climate risk problems from a variety of perspectives. The Economics Member Interest Group is looking at how economic theories take account of sustainability issues. The Financial Systems Thinking Innovation Centre, or FinSTIC, is looking at how systems thinking can be applied to changing the financial system so that it delivers for society, the environment and the economy. And the Actuaries' Carbon Collaboration is acting on climate solvency by working towards a coherent understanding of the issues around carbon emissions and offsets by considering them in an actuarial context.

These are all examples of the IFoA learning to work in new ways – groups led by actuaries, collaborating with others, with varying degrees of formality. We're working towards a much more open and facilitative culture, where the IFoA can provide a platform for groups of thought leaders to come together and discuss interesting and provocative ideas. This is an area where technological developments can make all the difference. During this year we've had several series of thought leadership events addressing such topics as Finance in the Public Interest,

Actuarial Innovation in the Covid-19 Era, and Behavioural Science. In the coming year you can expect more of the same, with an especial focus on sustainability in the run up to COP-26 this autumn.

At the beginning of this year the IFoA issued a policy statement on climate change, supporting the aim of the Paris Agreement to limit climate change to an increase of substantially under 2°Celsius from pre-industrial temperatures, and recognising that for there to be a reasonable probability of achieving this aim there must be a transition to a global economy that has no net greenhouse gas emissions by 2050. The IFoA will continue to work with national and supranational organisations to better align the financial system with a net zero ambition. But it's not only the IFoA which must play its part – all actuaries can also lead change in the financial system to serve the public interest in the management of climate-related risk.

It's an enormous challenge, but also an enormous opportunity. Change can create new openings as well as closing old dead ends. There are opportunities for actuaries, and also for the industries many of us work in. Financial institutions such as insurers and banks must ensure that their products and services actively drive the change that is needed for a transition to a net zero world and support people negotiating the rapidly changing risk landscape. And we actuaries can help them to do that.

## Conclusion

I'm proud to be an actuary. It's enabled me to have an extremely varied career, and the actuarial skillset has proved to be a fantastic foundation for learning new skills and branching out into new areas. And I'm not alone in my view. I asked some actuarial friends what they enjoy about what they're currently doing.



Thanks to Dick, Megha, Faisal, Pin-Nee, Claire, Ashok, and Kudzai for reminding us of so many good things.

The times we're living in are challenging, to say the least. As I've discussed, change is all around us and in many ways change is uncomfortable. Change is affecting our traditional fields of work as well as opening up potential new fields, and we have to be able to learn new skills in order to handle challenges as well as seize opportunities. We need a growth mindset to adapt to our changing world.

Learning is absolutely vital to our well-being. The IFoA must learn as an organisation if it's to survive, and must support its members' learning if they are to be successful. The sustainability of our profession depends on learning. As well as being a Learned Society, the IFoA must be a Learning Society.