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Climate Change Toolkit for Retirement Funds

Do No Harm:
What Could A Generative Actuarial Education System Look Like

Let's talk about annuitisation – Part II

From Social Work to Actuarial Expert:
JASMIN VAN SCHALKWYK'S INSPIRING JOURNEY



ACTUARIAL SOCIETY OF SOUTH AFRICA
Advancing Actuarial Excellence

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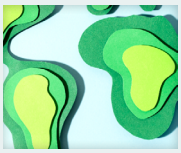
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RELEVANCE AT THE CORE OF OUR PROFESSION

As we move further into 2025, this issue of *The SA Actuary* stands as a powerful reminder that relevance, whether it's technical, social, or ethical, is the defining currency of our profession. As we open this latest edition of The SA Actuary, I return to the theme that has guided much of our work this year: "relevance".

Costa Economou

PRESIDENTIAL perspective

In a world overflowing with data but often lacking direction, our value as actuaries does not rest solely in our technical competence. It lies in our ability to stay relevant. Relevant to the public interest. Relevant to the questions that matter. Relevant to the future we are helping to shape. This edition continues to showcase actuaries responding with clarity amidst uncertainty, of which I am especially proud. I would like to at the outset thank the Editorial Team, under Michael Tichavera's leadership, and pay special thanks to all the contributors for their excellent articles and thought leadership!

This edition begins with a heartfelt tribute to the late Joanna Combrink whose contributions to the retirement industry and actuarial education have been remarkable. We are all shaken and deeply saddened by her untimely passing. Her work with the Retirement Matters Committee, where I personally got to know her, the development of educational materials, and her involvement with the IAA reflected her unwavering dedication and passion for uplifting the profession. She leaves behind a lasting legacy. Her final article, "Let's Talk About Annuitisation – Part II", exemplifies her lifelong commitment to public-interest actuarial practice. Her voice joins those of many others in this issue, urging us not just to know more, but to mean more.

At the macro level, Sanisha Packirisamy presents a clear-eyed view of global economic headwinds, of which there are many, and which are happening with a level of regularity that is almost unprecedented, while John Anderson and the ASSA Climate Change Committee provide practical, forward-looking tools for managing climate risk, particularly for retirement funds. Pamela Hellig provides us with a framework for insurers to develop assumptions around this specific aspect of climate change and be able to provide evidence and justification for these assumptions. For life actuaries, climate risk is no longer a distant concern. It is a present and accelerating challenge that is still not well understood. Adél Drew presents a model that offers a valuable lens through which to explore the interconnected risks we face, and help model the impact of climate change on mortality.

With the election of Donald Trump as President of the USA, the impact of his government's subsequent decision to cut US Aid funding is tackled, along with articles on the intersection of climate and mortality modelling, and how deeply embedded actuarial thinking plays an important role in complex societal systems.

What would it mean to reimagine actuarial education—not simply as a technical training pipeline, but as a space fostering inner well-being, inclusivity, and human development in all aspects? In this deeply reflective and radical exploration, actuaries Shivani Ranchod and Soshan Soobramoney invite us into a world where excellence and collaboration can co-exist as the profession reclaims its humanity.

Beyond models and markets, this issue champions a more human-centred profession. From the UCT Actuarial House Committee's campus work to Michelle Abrahams' focus on member engagement, there is clear evidence of growing attention to well-being and professional belonging. Profiles of actuaries like Jasmin van Schalkwyk (who is an esteemed member of Council and who also Chairs ASSA's Operations Board), Imran Mahomed (ASSA's CEO), Edmond Vigoureux, and Mukami Njeru reflect the breadth and diversity of talent within our community. These voices remind us that the actuarial identity is no longer confined to just technical spaces. It is lived out through values, leadership, and often, personal reinvention.

The edition also highlights ASSA's "Clarity", a bold new podcast that brings actuarial insight to the forefront of today's most critical conversations. Hosted by Lucienne Fild, each episode explores how data-driven thinking and research contribute to meaningful change in society. In the first episode, Lucienne Fild sits down with Imran Mahomed, CEO of ASSA, and Sandy Govender, a representative from the ASSA Research Committee, for a powerful discussion on the role of actuarial research in shaping South Africa's future.

Technology and innovation are recurring themes. Whether it's Kuzivakwashe Kurehwa's exploration of stablecoins and inclusion, or Thapelo Sekanka's insights on actuaries in banking, these pieces push us to stay relevant in domains that are rapidly evolving. Perhaps most urgent are the discussions on machine learning fairness, digital equity, and the ethical boundaries of pricing, covered both in the main issue and in the Supplement. Articles by Shereen Francis, Prof. Yuwei Xu, and Thapelo Ndlovu critically examine whether our technical tools, if left unchecked, could unintentionally reinforce inequality.

The Supplement also extends our gaze beyond South Africa. Dr. Taonaziso Chowa's comparative study of universal health coverage in Zambia and Tanzania provides fresh perspectives on healthcare financing, while Yoboua Angoua's work applies game theory to improve claims efficiency, showing the intellectual richness actuaries are contributing across Africa. Interviews with Prof. Shirley Zinn and Janine Myburgh deepen the reflection, reminding us that leadership is as much about integrity and culture as it is about strategy.

In closing, remember that "relevance" is not a static state. It is a choice we make again, and again. It's choosing to speak up when fairness is at stake. To revisit our models when the world changes. To centre people (and societies), not just probabilities, in all of our calculations.

To all the contributors across this edition and in the supplement: thank you for showing what a "relevant" actuarial voice sounds like.



Michael Tichareva

EDITORIAL

IN MEMORY OF Joanna Combrink



In this editorial, I focus on **Joanna Combrink**, one of our Fellow members who passed away in July 2025. The SA Actuary editorial team, and the Actuarial profession at large, was saddened by this loss. She was an active and great contributor to the SA Actuary, and to the profession at large.

Joanna was a Fellow of the Actuarial Society of South Africa, having graduated with a bachelor's degree in actuarial science from the University of Cape Town. At the time of her passing, Joanna was working as an independent consultant at Actuarial Benefits and Consulting Solutions, a company she founded in 2023. Prior to that, she spent 17 years at Towers Watson.

Joanna made immense contributions to ASSA as a dedicated volunteer, serving as Deputy Chairperson of the Retirement Matters Committee and co-authoring the course material for the newly introduced Health, Social, and Employee Benefits Fellowship Principles subject. As a member of the Retirement Matters Committee, she was actively involved in education and international representation through the IAA.

Due to her immense contributions, Joanna was highly regarded in the profession, and her passing is a significant loss to our community. Her most recent contribution to the SA Actuary is the article titled **Let's talk about annuitisation – Part II** included in this edition. Part I was included in the November 2024 edition. These articles were also featured in Pensions World SA in Q2 of 2025 and Q4 of 2024 respectively.

Part I of Let's talk about annuitisation discussed the need for Trustees to review annuity strategies and products available to members in light of the introduction of the Two Pot System to ensure that these remain appropriate. Part II focuses on the appropriate pricing of these products. I trust you enjoy her most recent article as we remember and celebrate Joanna Combrink's life.

As I sign off, please remember to send us your comments and articles for future issues of the SA Actuary – the next issue is in Oct/Nov 2025!

Michael Tichareva
Lead Editor - On behalf of the Editorial Team

LET'S TALK ABOUT

Annuitisation Part II

by Joanna Combrink





Joanna Combrink

In the first part of this article around annuitisation (*"Let's talk about annuitisation – Part I" featured in Pensions World Q4 2024*), we discussed the need for Trustees to review the annuity strategies and products available to members in light of the introduction of the Two Pot System to ensure that these remain appropriate. While that article focused on the appropriate products for annuitisation, this article focuses on the appropriate pricing of these products.



Introduction

To recap, the Two Pot System requires that 2/3rds of future retirement savings must be preserved until retirement, and at retirement be used to purchase a pension. There is no opt out that allows the withdrawal of this portion of retirement savings before or at retirement in normal circumstances.

In the previous article we made the point that while the provision of appropriate, fit for purpose and appropriately priced products is always important, it becomes critical in a system where there is no exit available. The stakes are higher. The repercussions of forcing people to preserve and annuitise what is arguably the biggest asset they will ever have, and not paying attention to the products used for that annuitisation, can be significant.

How effectively individuals are able to convert their accumulated savings into a pension income will be a critical determinant of how well the retirement system meets (or fails to meet) the needs of its members.

We defined the objective of the retirement system as providing income security to individuals at retirement.

In order to fulfil this objective, as Trustees, service providers and Funds, we need to make sure that:

1. **The annuity product is appropriate**
2. **The annuity product is appropriately priced**

We discussed the types of annuity products available for annuitisation and their relative merits in meeting the objective as stated above. We suggested that living annuities probably struggle to meet the objective as stated above. We also suggested that consideration should be given to using the first part of the retirement benefit to purchase a life annuity which would guarantee an increasing pension for life (meeting the objective of providing income security) and the remainder to purchase a living annuity which would add the bells and whistles.

If we agree that the structure of the life annuity makes this product most fit for purpose to meet our objective of providing income security in retirement, then we need to make sure that it is appropriately priced. If it is not, then it does not matter how well it meets its objectives, it will be inappropriate for members.

Combrink and Taylor presented a paper titled "Fairness of annuity pricing for low-income earners in South Africa" at the Actuarial Society of South Africa's annual conference in October 2023, where they discussed whether the life annuities were fairly priced in the South African market, with particular emphasis on fairness towards lower-income earners. The remainder of this article summarises their paper.

What do we mean by appropriate pricing?

By appropriate pricing, we mean that the price of the annuity is fair i.e:



- The price of the annuity must be reasonable relative to the expected benefit received (unless there is an argument to be made that cross-subsidisation would result in the less vulnerable subsidising the more vulnerable). More on cross-subsidisation in the information box.
- The system should treat and price essentially similar situations similarly and with consistency.

Pricing of annuities 101

When we price an annuity, we need to determine how much money a member would need to pay now (the purchase price) so that the insurer is able to pay them a specific amount of pension per month, with increases, until their death. In this calculation, many assumptions are made about investment returns, costs, increases, and, importantly, how long the payments will be made for i.e. mortality / life expectancy.

Impact of income on life expectancy on annuity pricing

It is intuitive that if two individuals both want a pension that pays them R1,000 per month until their death, and one of these individuals is expected to live longer than the other one, then the one who is expected to live longer will have to pay more than the other one (because he is expected to receive more payments).

Mortality investigations show that lower-income individuals have a higher probability of death at each age and, therefore, in general live shorter than higher income individuals. The 2017 CSI report shows that the mortality rate (chance of dying) for a 60-65 year old male who has a pension of less than R10,000 per month is three times higher than those who earn a pension of more than R100,000 per month.

This means that lower income individuals should pay around 20-30% less than their higher income counterpart for the same pension when they retire.

But they do not.

Annuity pricing in South Africa

In the retail market (where an individual wants to purchase a pension for themselves at retirement), insurers do not take income or any income proxies into account when pricing life annuities. This means that the lower-income and higher-income individual will pay the same amount for the same pension even though the high-income individual will outlive the lower-income individual and receive more pension payments.

This is not fair as the premium does not reflect the expected benefit, and the cross-subsidy is from lower income to higher income i.e. the higher income are paying less than they should and lower income more than they should.

Inconsistencies

1. Retail vs institutional pricing

Where a pension fund (rather than an individual) approaches an insurer to take over its pension payments, this is called the institutional market. In the institutional market insurers do take income into account in annuity pricing.

Thus, the pricing is not consistent between the retail and institutional markets.

Insurers argue that this is due to anti-selection risk i.e. that where an individual retires, if they know they will live shorter they will rather take cash, so anyone choosing to buy an annuity will have a longer life expectancy than average which poses a risk to the insurer. This risk is not present in the institutional market where the individual has no say in whether an annuity is purchased.

Though this argument has some merit, it only accounts for part of the pricing difference.

If the purchase of a life annuity, even up to some limit, was legislated for everyone, this would eliminate anti-selection risk and result in lower annuity rates for lower income individuals. Though the Two Pot system requires the purchase of an annuity at retirement, living annuities are permitted. Individuals who expect to live shorter could rather purchase a living annuity and take a high drawdown, thus anti-selection risk remains.

2. Life insurance pricing

Life insurance is where in return for a monthly premium, the insurer will pay a lump sum on the death of an individual. Income is taken into account in the pricing of life insurance. Because insurers know that low income individuals have a higher chance of dying, and, therefore, the chance of paying a claim is higher. The cost of each Rand of life cover is higher for a low income individual than a high income individual.

If this is taken into account in life insurance pricing to benefit the insurer, should it not also be taken into account in life annuity pricing, this time to benefit the member?

We note that insurers have provided some reasons for why it is impractical to rate individual policies by income.

Conclusion

The author concluded that not allowing for income rating in the retail annuity market results in unfair pricing as the price does not reflect the expected benefit. In their view, the insurers' reasons for not doing this could be addressed.



The author also noted that there is more incentive and willingness for insurers to offer more competitive rates in the institutional market than in the retail market. As retail annuity rates are publicly available, it is in their view unlikely that insurers would voluntarily begin to apply income ratings in retail annuities as this would indeed expose them to anti-selection risk. In their view, the requirement to take income into account needs to be legislated.

They also noted that the level of discrepancy between retail and institutional pricing is unlikely to be explained by anti-selection alone, and the costs and other margins in retail annuities should be addressed as the impact on pricing is material. In addition "as long as living annuities continue to be permitted for compulsory annuitisation purposes, anti-selection will result in higher life annuity prices than would otherwise be the case."

At the time of writing this article, there is one insurer that we are aware of who does take income into account in the retail market.

At the time of writing this article, there is one insurer that we are aware of who does take income into account in the retail market.

Let's ask the others to do the same.

Let's ask government to support.

Let's apply our minds. Let's find a way to make things better.

Cross-subsidy vs Homogenous pricing

Homogenous pricing and cross-subsidisation are opposing approaches that could both be considered fair, but which yield different results.

Cross-subsidisation refers to the concept whereby one group of individuals pays more than they should (given their risk factors) and another group pays less than they should (given their risk factors) so that though the premium for each group is not correct for either group, it is correct on average. This is an important concept and is the fundamental risk-spreading tool used in insurance markets. By pooling risk in this way, insurance products can be offered to high risk individuals who would otherwise not be able to afford the premiums. Without any cross-subsidy from the lower-risk group the premiums payable by the high-risk group (who are most in need of insurance protection) would be unaffordable.

In plain English, this is where some people pay more than they should and others pay less than they should so that those who need the benefit most can afford it. One example of this is found in medical scheme pricing in South Africa. A person with cancer will have higher medical expenses than a person without cancer, but they are both charged the same amount as a premium. The unused premiums of the healthy person are used to pay the claims of the sick person. Without the cross-subsidy from the healthy person to the sick person, the sick person could not afford the healthcare (which they would effectively have to fund themselves).

This method is considered fair because everyone gets the same benefit for the same price.

Homogenous pricing refers to a pricing mechanism whereby the premium paid by an individual is directly related to the expected benefit to be paid to that individual based on their own risk factors. In our medical scheme example above, all the cancer patients would be grouped together and their average cost would be charged to each as a premium. This method is considered fair because the premium directly reflects the specific individual's expected benefit.

In recent times, there has been a shift from cross-subsidisation to homogenous pricing - from "everyone pays the same rate and gets the same benefits if they need them" to "each pay for themselves and their particular risk". We have seen this in the retirement industry in the move from defined benefits to defined contribution funds, and within defined contribution funds in the move from a smoothed bonus approach to individual member investment choice and daily unitisation.

However, cross-subsidisation in other contexts remains acceptable and unavoidable. For example:

- The medical schemes industry in South Africa operates on the basis of community rating, where the medical scheme is prohibited from charging an unhealthy person a higher premium than they charge a healthy person for the same set of benefits. This creates an intentional cross subsidy from the healthy / young to the sick / old.
- Costs in the pension system are often deliberately charged as a fixed percentage of salary or assets rather than a Rand per member per month amount even though the Rand value of the actual cost is the same for all members. This creates a deliberate cross subsidy from the rich to the poor.
- The South African tax system, being progressive, applies a higher marginal tax rate to higher income individuals than it does to lower income individuals. This creates a deliberate cross subsidy from the rich to the poor.

This article has been produced posthumously. Joanna Combrink was an independent consulting actuary. She wrote in her capacity as the Deputy Chair of the Actuarial Society's Retirement Matters Committee. Joanna sadly passed away in July 2025.

CHECKMATE DELAYED:

The global economy holds its breath—

NO CRISIS YET, BUT THE TENSION IS RISING

by Sanisha Packirisamy



Chief Economist –
Momentum Investments

The global economy resembles an unbalanced chessboard. Some powers play offence, launching high-stakes gambits to reshape the rules. Others retreat, clinging to defensive positions as the tempo accelerates. Strategy feels improvised, alliances shift mid-game, and the old playbook no longer applies.



According to the World Bank's *Global Economic Prospects* report published in June 2025, global growth is projected at just 2.3% this year—matching the weakest pace since the 2008 financial crisis, excluding recessions. The slowdown is broad-based, with growth downgraded in nearly 70% of countries across every income bracket. Investment is lagging, global trade is losing steam, and the structural foundations of the previous era are beginning to shift.

Among the more aggressive players on the board is the United States (US). The reimposition of steep tariffs under President Donald Trump has injected volatility into markets. By April 2025, effective tariff rates had surged to 27%—the highest since the 1930s—before a negotiated pause lowered average rates to 15.8% by June.

Markets responded in kind. Equity markets dropped sharply as tensions escalated, only to rebound once a temporary truce was reached. Bond markets, however, remained unsettled. Higher US fiscal spending has pushed up Treasury yields, and the inflationary impact of tariffs—especially when passed through to consumers—has further complicated the picture.

While the US plays offence, China has repositioned its strategy—from low-cost exporter to high-tech competitor. State-supported research and development, deep talent pools, and rising technological capacity have placed China in direct competition with the US in semiconductors, artificial intelligence and advanced electronics.

The US' response has included both tariffs and industrial policy aimed at reshoring supply chains. But that's easier said than done. Labour cost disparities remain vast—US workers earn on average seven to sixteen times more than peers in Asia and Latin America—undermining efforts to fully re-domesticate manufacturing.

SA must keep repositioning—advancing reforms, holding its fiscal line, and shoring up credibility before the board resets again.

Meanwhile, the US is also rolling the dice on fiscal prudence. The One Big Beautiful Bill Act, passed in June 2025, may boost growth by 0.2 percentage points annually through 2027, but the Congressional Budget Office expects debt to swell to 118% of gross domestic product by 2035—exceeding the post-World War II peak.

South Africa (SA) faces a fragile domestic position—and the external game is only adding pressure. While the formation of the Government of National Unity (GNU) in 2024 and reduced power cuts improved sentiment, these gains have not translated into meaningful growth. The economy is forecast to expand by around 1% in 2025 and approximately 1.5% in 2026. Unemployment remains stubbornly high, and inequality continues to cast a long shadow.

Operation Vulindlela—a joint initiative between the Presidency and National Treasury—is central to unlocking structural reform. Initiatives to expand transmission infrastructure, partly privatise freight logistics, improve water supply, connect people to work opportunities, and increase efficiency at the municipal level offer hope of repositioning the economy to a more advantageous spot on the board. But execution risk remains high, and political uncertainty may delay progress.



SA's fiscal picture is similarly fraught. Public debt has risen from 23.6% of GDP in 2008 to 74.1% by 2023—among the sharpest increases in the emerging market world. The International Monetary Fund warns that without decisive action; the debt ratio could reach 88% by 2030. While the structure of debt—long maturities, low foreign exposure—provides some buffer, the growing cost of servicing debt shrinks the state's fiscal room to manoeuvre.

A likely exit from the Financial Action Task Force grey list in late 2025 would be a much-needed win, signalling progress on regulatory reforms. It could also help restore investor confidence—essential for capital inflows at a time when global risk appetite is already fraying.





Inflation has retreated, giving the SA Reserve Bank space to consider rate cuts. A stable rand, favourable commodity prices, and a pause in oil-driven inflationary pressures support this trend. Still, political risks, potential administered price increases, and uncertainty around the inflation-targeting framework may limit the central bank's room to ease from here.

The GNU, while holding for now, remains an uneasy alliance. Inter-party tensions could flare if local election outcomes alter the balance of power and this could stall reform momentum.

This is not yet the endgame—but the board is getting crowded. Strategy has turned reactive, risks multiply with every play, and the margin for error is narrow. SA must keep repositioning—advancing reforms, holding its fiscal line, and shoring up credibility before the board resets again.

Globally, the pieces are in flux. Rules are being rewritten mid-match, alliances are shifting, and volatility is the only constant. Victory rarely comes from flashy plays—it's built through quiet control of the board.

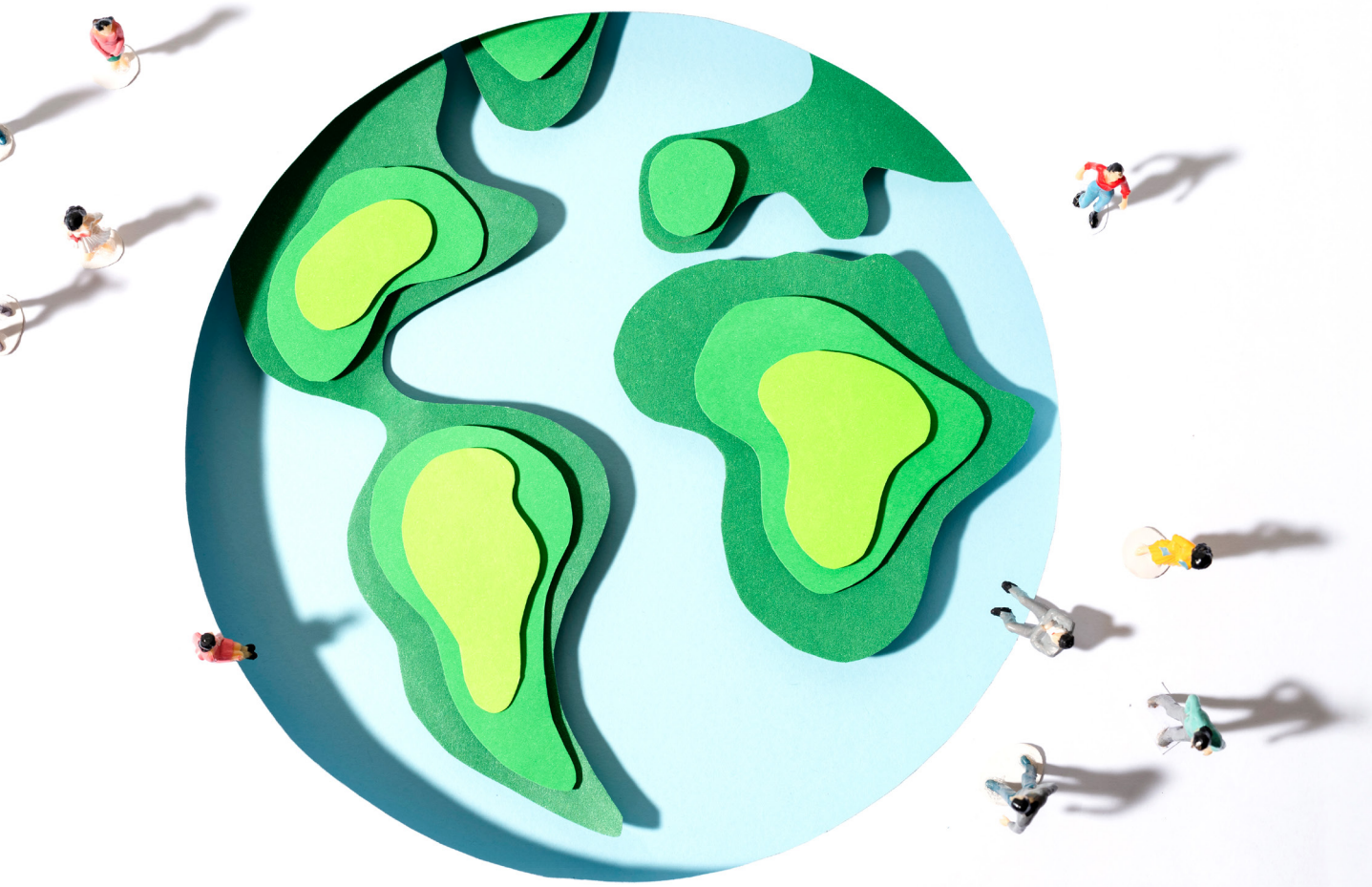
Climate change toolkit for retirement funds

by John Anderson



INTRODUCTION

The World Meteorological Organisation declared 2024 the hottest year on record, following ten consecutive years of exceptional land and sea surface temperatures driven by human-generated greenhouse gas emissions. We have also witnessed the immediate real-world impacts from more extreme weather events, with the frequency and severity of these events increasing as further warming takes place.



Recent research by the EDHEC Climate Institute estimates a 35–40% chance that temperatures will rise beyond 3°C by 2100, with a median warming estimate of 2.7°C, indicating significant departure from the Paris Agreement goals. At these levels, the socio-economic impacts are significant with the global GDP reducing by between 30% and 80% over the long term.

IMPACT ON RETIREMENT FUNDS

The long-term nature of retirement fund investments makes them particularly vulnerable to the effects of climate change. Changes in economic growth, inflation, salary increases, expected returns, and mortality rates are all influenced by climate-related factors. Actuaries must consider these variables in their models to accurately assess the financial health of retirement schemes. As stewards of long-term investments, actuaries must integrate climate-related risks and opportunities into their strategic planning to ensure the sustainability and resilience of retirement funds.

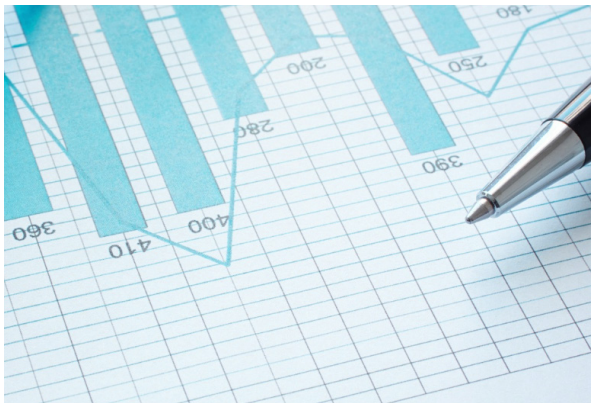
GAP IN INCORPORATING CLIMATE CHANGE INTO FUND MANAGEMENT AND ACTUARIAL ADVICE

Despite the significance, evidence still shows that retirement funds in South Africa have not fully integrated climate risk and opportunities considerations into how they are run.

A 2024 analysis of the practices of large funds (representing over 60% of the industry by size of assets) in South Africa in relation to the management of climate change was conducted. An extract from this analysis is as follows:

Sustainability criteria	Average sustainability score out of 100%	Highest score	Lowest score	Std deviation
Climate change	11%	44%	0%	15%

Source: Anderson J, Devlin P, Leicht C et al, Providing a pension income that prices in social and environmental externalities: a reporting framework, JoCo 2024 conference



There is, therefore, a significant shortfall relative to an ideal score of 80% with no funds achieving this and many funds showing a score of 0%.

It was also found that actuarial projections and reserving assumptions often do not explicitly include allowances or considerations to account for the long-term implications of climate change. This is a significant risk for the actuarial profession and individual actuaries providing advice.

Overall, evidence points to the fact that significant improvements are still required in how retirement funds incorporate climate change into their strategies and asset-liability management

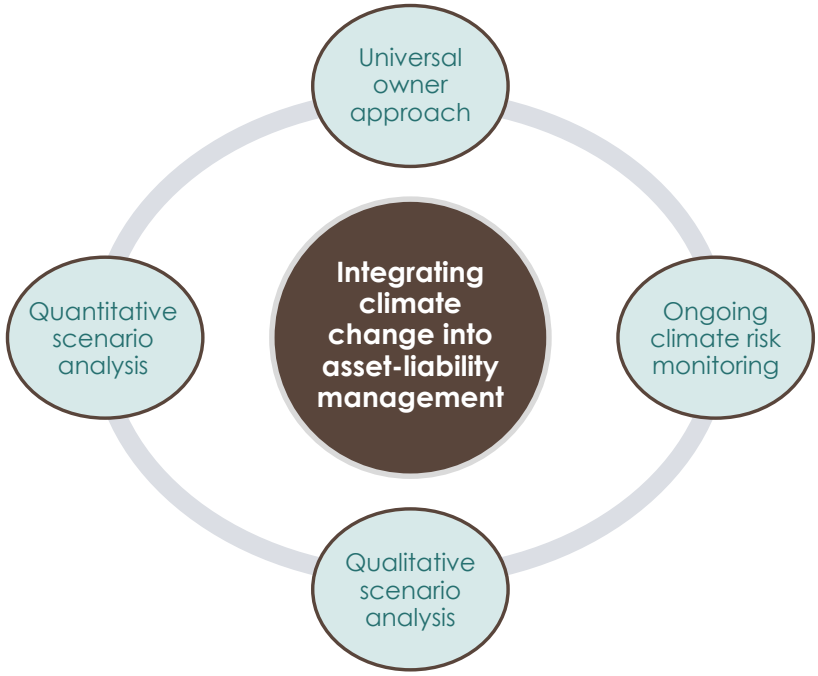
ACTUARIES CONCERNED ABOUT THE IMPACT OF CLIMATE CHANGE ON RETIREMENT SAVINGS

Concerned that South African retirement fund trustees are not factoring the risks and opportunities presented by climate change into their investment strategies, the Actuarial Society of South Africa (ASSA) released a Climate Change Toolkit for actuaries and trustees. The toolkit was compiled by a joint working group consisting of actuaries from the ASSA Climate Change Committee, the ASSA Retirement Matters Committee and the ASSA Investment Committee.

The toolkit provides actuaries and trustees with guidance on integrating climate risk management into their strategies to ensure the provision of sustainable retirement incomes while contributing positively to society and the environment.

An important starting point is for funds to establish a governance structure that includes climate risk management as a key component, supported by actuaries and benefit consultants. Once this is in place, actuaries can make use of the toolkit to develop a strategy that considers the impacts of climate change on investment and funding decisions, employer covenant resilience, and benefit structures.

The overall framework, which integrates climate change into the asset-liability management of a fund, can be summarised as follows:



1. **Universal ownership:**
   Retirement funds should adopt a universal ownership approach, recognising that their investments have broader societal impacts. This perspective encourages responsible investment practices that support sustainability.

2. **Ongoing climate risk monitoring:**
   Funds should establish processes for ongoing monitoring and reporting of climate risks and opportunities within their investment portfolios.

   Climate metrics that can be used for monitoring investment portfolios include weighted average carbon intensity, carbon footprint, stranded assets, physical risk exposure, climate opportunity, climate value at risk (VaR), implied temperature rise (ITR), and stewardship activities. These metrics help funds understand and manage climate-related risks, track progress against goals, comply with regulatory requirements, and inform beneficiaries of climate-related impacts.

3. **Qualitative scenario analysis:**
   Actuaries should include scenario analysis to assist trustees' understanding of the risks and opportunities.

   Use of scenario analysis is useful to inform strategic planning, investment and funding strategies, and benefit restructuring. Actuaries should develop scenarios based on different levels of greenhouse gas emissions and their impact on long-term temperature outcomes. The analysis should consider various time horizons, the nature of the transition to a low-carbon economy, and the potential effects on asset classes and liabilities and be regularly updated based on new climate data and research.

4. **Quantitative scenario analysis:**
   Actuaries should consider scenarios in relation to DC fund projections as well as the potential implications on the funding levels of DB funds.

   Actuaries should adjust long-term actuarial assumptions to account for different climate scenarios, including net-zero orderly, net-zero disorderly, limited action, and high warming scenarios. These adjustments help members and funds assess their financial resilience under different climate conditions, informing what actions can be taken to improve the outcomes.



CLIMATE CHANGE OPPORTUNITIES

Importantly, there are also various opportunities for funds in relation to investments aimed at the transition to a low-carbon economy and those investments resulting from increased adaption to a warner planet. These include investments in clean energy, innovation in energy storage, green and climate-change resilient infrastructure, and sustainable agriculture amongst others.

There are regions, asset classes, sectors and companies that will benefit from the transition to a low-carbon economy and there are those that will be negatively affected. Also, there are regions, asset classes, sectors and companies that will benefit from the adaptation that will be necessary to be resilient on a warmer planet. The key with investment strategies is to identify how best to mitigate the risk and benefit from the opportunities.

A CALL TO ALL ACTUARIES PROVIDING SOLUTIONS AND ADVICE TO RETIREMENT FUNDS

Retirement funds are important and influential asset owners. By prioritising responsible investment opportunities, retirement funds are well placed to drive meaningful adoption of environmentally and socially conscious practices, enabling sustainable returns for beneficiaries.

By following the framework outlined in this article, actuaries can help retirement funds navigate the challenges and opportunities presented by climate change, ultimately contributing to a more sustainable future for all stakeholders.

We therefore encourage actuaries to utilise the ASSA Climate Change Toolkit, incorporating climate change into their work. The Toolkit is available on The Climate Change section of ASSA's website: **https://www.actuarialsociety.org.za/downloads/climate-change/**

ASSA Climate Change Committee report-back

- MORTALITY AND MORBIDITY IMPACTS FRAMEWORK NOW LIVE

by Pamela Hellig



Head of Insight Life Solutions

In late 2023, the ASSA Climate Change Committee established a working party to investigate the impacts of climate change on mortality and morbidity risks and experience. The working party's remit was to develop a framework for life and health insurers looking for a place to start in terms of assessing and quantifying these impacts. This framework is now available on the ASSA website for members to use and customise as they see fit. In this article, Chair of the working party and Head of Insight Life Solutions, Pamela Hellig, explains the need for this framework and the approach that was taken in constructing it.

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Climate change has been defined as a "super wicked problem" because it's not just a regular wicked problem that defies solution because it is closely intertwined with other problems. It's a super wicked problem, because it has all the wicked traits of complexity and social divisiveness, as well as additional difficulties presented by an urgent timeframe and by social injustice: the nations that carry the most responsibility for climate change and the most power to affect it also have the least incentive to do so.

For actuaries, it's an overwhelming problem because it could affect and exacerbate just about every other risk to which insurers are exposed. It's not a single risk or even a chain of risks that we need to analyse and manage. It's a giant, multi-dimensional universe of risks and potential outcomes which diverge very quickly into a tornado-sized funnel of doubt.

In this universe, we have physical risks and transition risks; we have risks that affect our assets and risks that affect our liabilities; we have many, many hazards, or "symptoms" of climate change that could affect our policyholders and our businesses in different ways; we have direct, first order impacts of these hazards, but then we also need to think of the second, third, fourth order impacts. There's also the concept of double materiality, which means that not only do we need to consider the impact climate change is having on us, but also, how we, as insurers, are contributing to the problems of climate change. And just to make things even more complex and murky, there is limited data, we don't have existing models to help us, and we still have all of our other, known and emerging risks to worry about.

It's very easy to become paralysed when thinking about this problem because it's so big, complex and depressing – and to end up not doing anything. But, there is another option.

> A quote often attributed to Archbishop Desmond Tutu goes "There's only one way to eat an elephant – one bite at a time". This is the thinking that informed our working party's approach and allowed us to overcome paralysis by overwhelm.

In order to fulfil our mission of contributing something meaningful to the Profession, we chose a very specific proverbial bite on which to cut our proverbial teeth: the direct impacts of climate change on mortality and morbidity. So, we made this the remit of the working party – to produce a framework that will help South African life insurers investigate and assess the direct physical impacts of climate change – like temperature rise, floods, droughts, rising sea levels, etc. – on their mortality and morbidity experience. We did not consider, for the first version, at least, any second order impacts or indirect impacts, or impacts on assets or other risks like lapses or expenses.



We purely considered this very digestible, bite-sized portion of the universe of risks that come with climate change. And this narrow scope is what allowed us to produce output that could be built on and expanded over time to incorporate more risks, more impacts, more hazards. Our motto was "progress over perfection" and this attitude is one we would encourage all insurers who don't know where to start, to adopt. We see the work we have done to date as a tool for life insurers who want to start bringing climate change into their actuarial functions, their risk management, their strategy and their governance processes.

To date, many life insurers have not fully considered this risk because there is a general feeling (according to various surveys, polls and anecdotes) that climate change will not materially impact mortality and morbidity; at least not in the short to medium term. Our work does not comment on whether the additional mortality and morbidity risks presented by climate change will be material or not. Rather, it presents ideas on how life insurers and actuaries may go about assessing this hypothesis, making assumptions about the future based on a combination of historical experience, research and professional judgement and then evidencing the assessment that justifies assumptions made.

So, while it may very well be the case that the impact of climate change on mortality risk will turn out to be minimal, each insurer needs to be able to justify why that's the case for their specific set of circumstances. And, at these early stages of the climate risk management journey, this justification does not need to include a terribly sophisticated statistical model. It just needs to be substantial enough for the insurer (and, at some point, the regulator) to be satisfied that sufficient attention and consideration have been applied to stand by their assumptions. In fact, it is an area where a lot of the work can be done at a general level, leaving the insurer to apply it to their unique combination of business context, product suite, geographic location and policyholder profile. And this is where our framework comes into play.

To date, we have developed a framework structured in the form of a typical risk management cycle, which users can consume in its entirety, or extract inspiration and ideas from the various steps as they see fit.



We have sections that provide guidance on how to:

- **identify** climate-related risks which may affect mortality and morbidity;
- **assess** these risks and determine their materiality;
- **manage** the risks as part of the various functions of an insurer;
- **monitor** the risks by continuously reporting on them, including considerations for scenario analysis; and
- **modify** the assessment and management of these risks over time as various factors evolve.

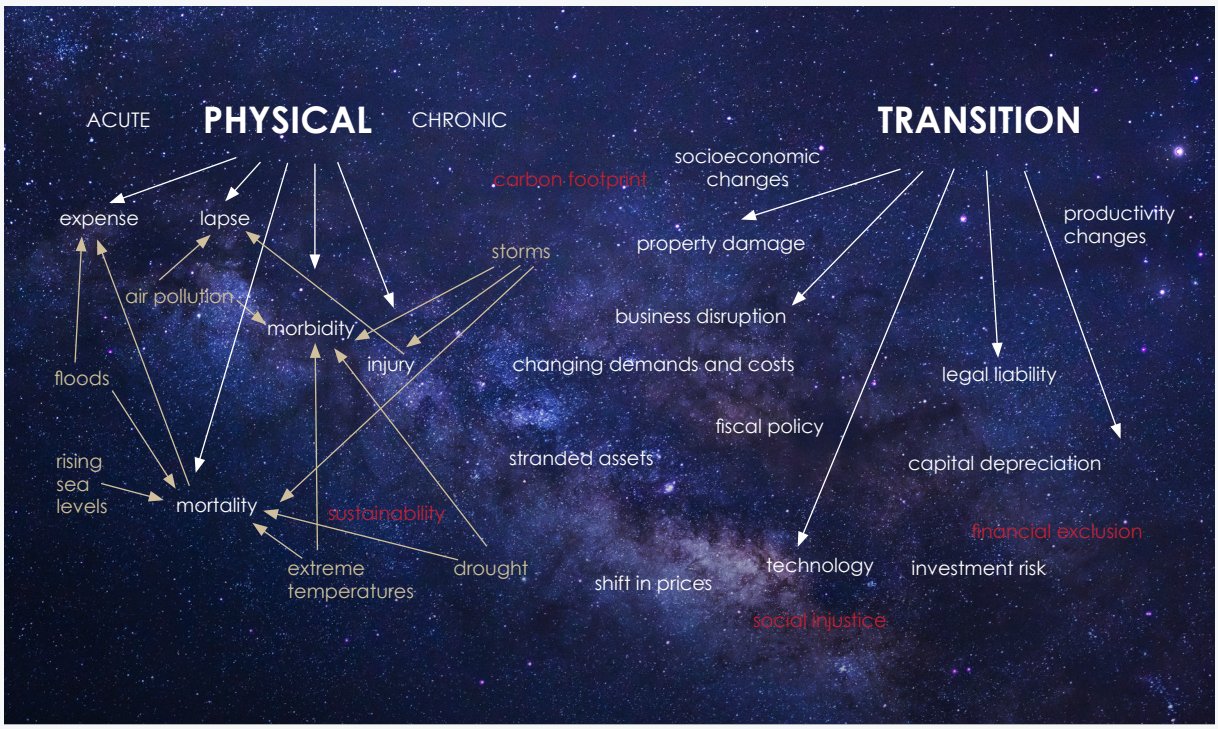
The framework also includes a worked example of how an insurer might use the framework, as well as reference to a paper we produced and presented at the 2024 ASSA Convention showcasing original research we conducted on the impacts of extreme temperature on the mortality of a sample of insured lives in South Africa.

The idea is that an insurer should be able to work through this framework and have everything they need to develop assumptions around this specific aspect of climate change and be able to evidence justification for these assumptions. The framework is not intended to provide official guidance in any way – it is a living, evolving document, which we hope users will make their own, take from it what is useful, and, hopefully, improve with their own thoughts and experience. We highly encourage feedback and collaboration from any actuaries who can take the time to engage with our output, start applying it in their teams, and make those bites of the elephant even smaller.

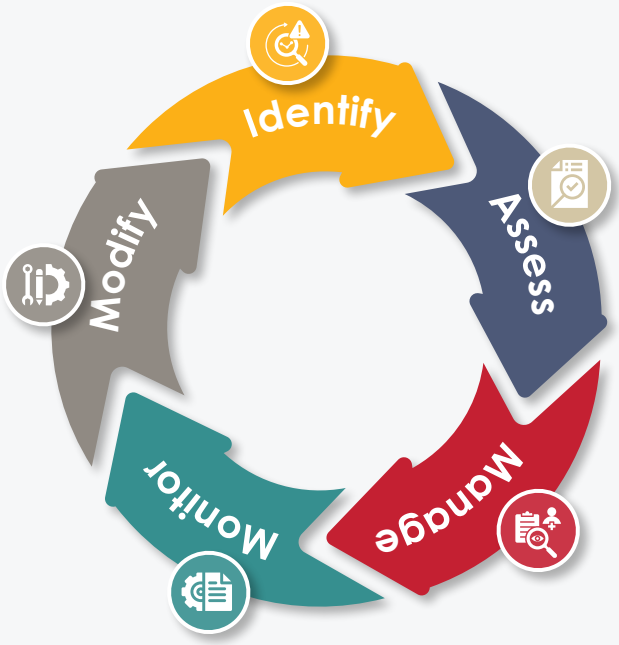
The framework is now live on the ASSA website and may be found in the "Additional Information" section of the Climate Change Committee homepage or accessed directly here.

CLICK HERE

Universe of climate-related risks:



The framework structured as a risk management cycle:



- Explain physical hazards and key indicators
- Set out process to find key indicators
- Suggest statistical techniques to quantify impacts
- Share findings from exisiting research
- Suggest how findings may be used in various functions (pricing, product design, reinsurance, etc.)
- Refer to worked example
- Discuss scenario analysis as a tool
- Speculative discussion encouraging the user to envision how things may change

Beyond NET-ZERO

RETHINKING MORTALITY IN A CHANGING CLIMATE

by Adél Drew



Adél Drew | *Milliman*

As actuaries, we are trained to quantify risk, but climate change is challenging us to rethink how we do this.



One area of debate is the impact of climate on mortality, where some actuaries believe that climate effects may be immaterial to their long-term mortality experience. While direct impacts — such as heatwaves, floods, and wildfires — often dominate discussions, the more complex and less understood second-order effects and their interwoven interactions remain largely underexplored. At Milliman, our recent research, presented at the 2025 Actuarial Society of South Africa (ASSA) Life Assurance Committee Seminar, explores these dynamics through a prototype causal model designed to assess climate-related mortality risks in a more holistic and interconnected way. Whilst our model was developed and calibrated for the United Kingdom, we believe it has insights to offer the South African market.

Why causal modelling?

Traditional frequency–severity models often fall short when dealing with complex non-linear and systemic risks like climate change. A causal model aims to capture how a system operates by placing the modelling emphasis on causal links between different factors, assessing how they interact and interrelate. It allows us to model the pathways from climate drivers — like rising temperatures or biodiversity loss — through to possible outcomes such as excess mortality while accounting for confounding variables like healthcare capacity or economic strain.

This method is particularly valuable in contexts where data are sparse or historical trends are no longer reliable predictors — something actuaries will recognise when grappling with climate volatility, infrastructure fragility, and public health challenges.

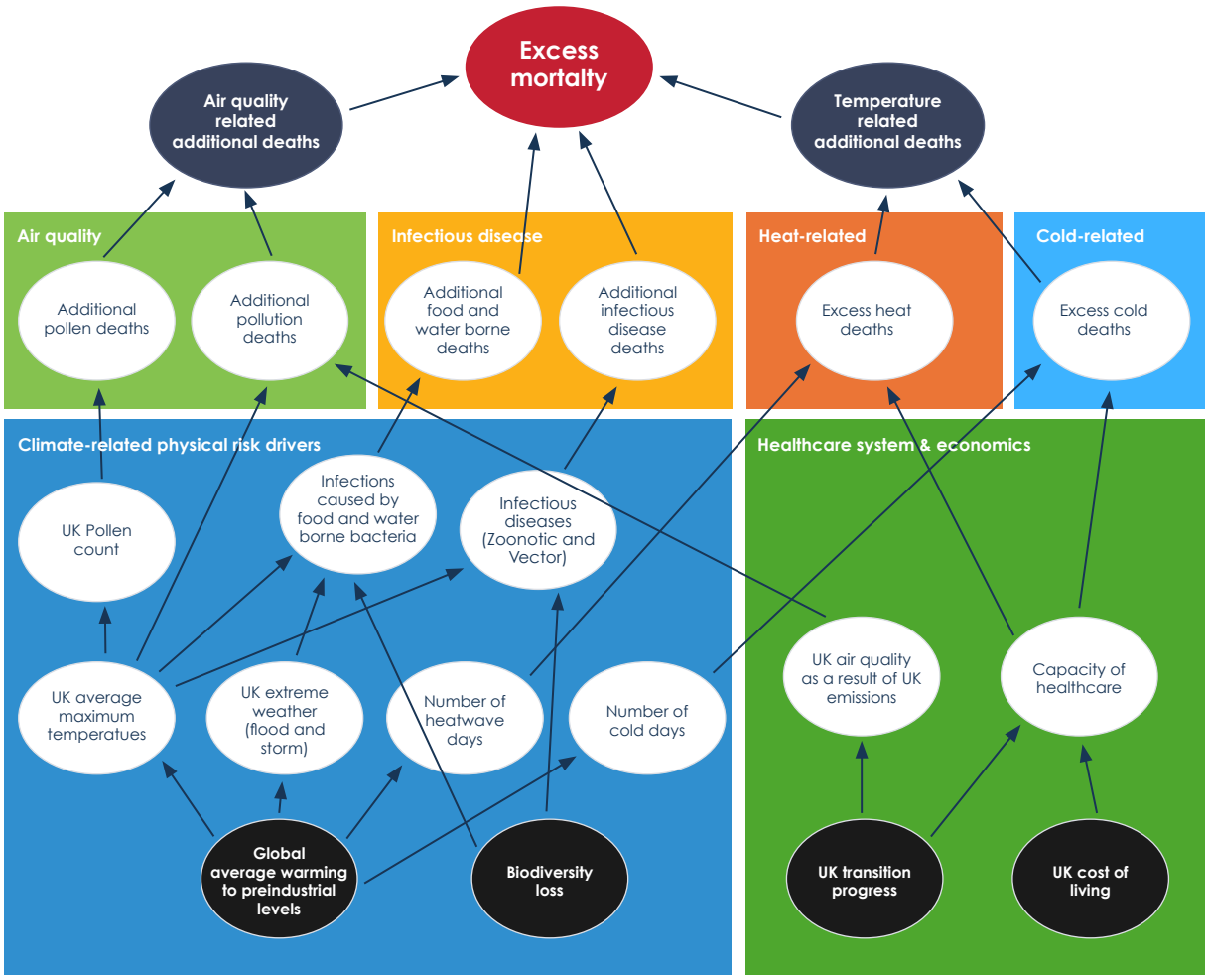
Creating a climate mortality model

Our model centres on three primary climate-related drivers of mortality, identified through desktop research as the most frequently cited factors:

- Air quality – shaped by emissions levels and the pace of the energy transition
- Extreme temperatures – encompass both heat- and cold-related mortality
- Infectious diseases – include vector-borne, food-borne, water-borne, and zoonotic diseases

In addition, the model examines how these mortality drivers are affected by evolving physical climate conditions, as well as by socio-economic factors such as healthcare system capacity, air quality, and the pace of climate transition.

Figure 1: Structure of the Milliman Climate Mortality Model



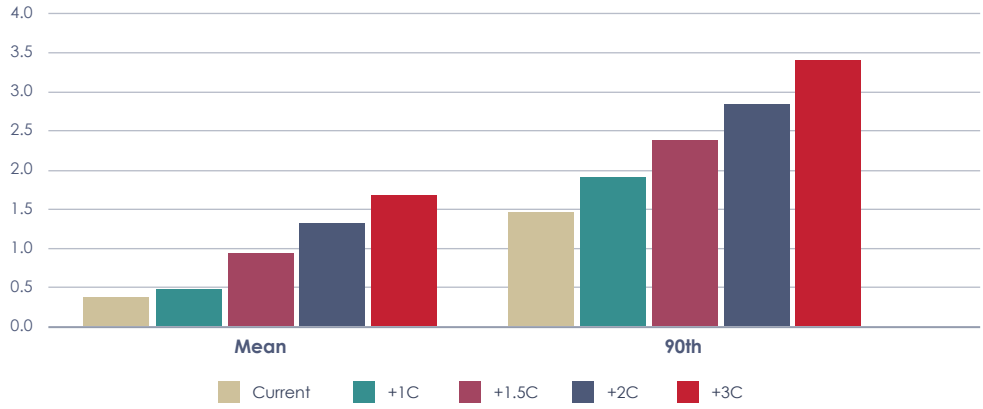
Source: Adapted from Climate forecast: Looking beyond net-zero mortality predictions. Milliman.



Key findings: Not all warming is equal

Initial analysis of the factors considered in the model indicates that each degree of warming results in a ~30% increase in excess UK deaths. Pollution levels and healthcare funding had an insignificant impact within the model on the overall level of additional deaths from climate-related factors in the UK. However, it is worth considering if some of these factors might be more influential in a South African context, where healthcare systems are more constrained and environmental exposures more acute.

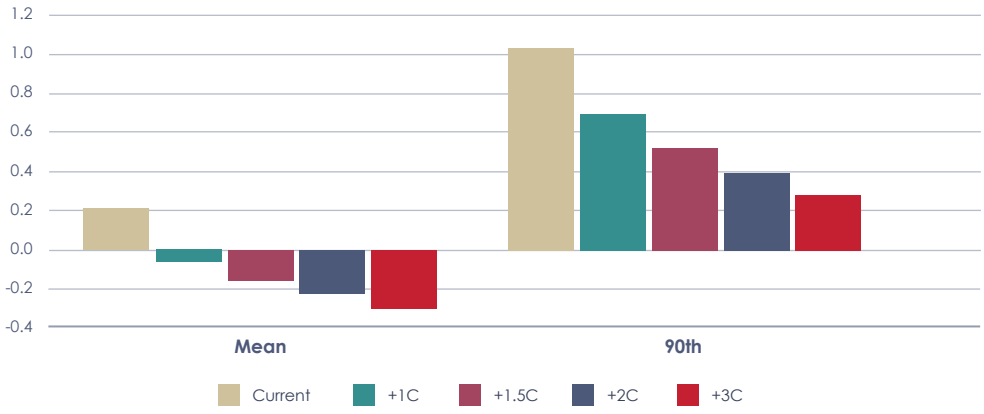
Figure 2: Excess mortality distribution mean and 90th percentile from climate factors (Pper 1,000 population) under different global average temperatures



Source: Climate forecast: Looking beyond net-zero mortality predictions. Milliman.

Further investigation revealed that the headline results masked key underlying factors—most notably, a substantial portion of excess mortality was attributable to infectious diseases. On minimising this influence within the model, we saw a reduction in excess deaths per degree of warming.

Figure 3: Excess mortality from climate factors (per 1,000 population) under different global average temperatures after reducing the impact of infectious diseases



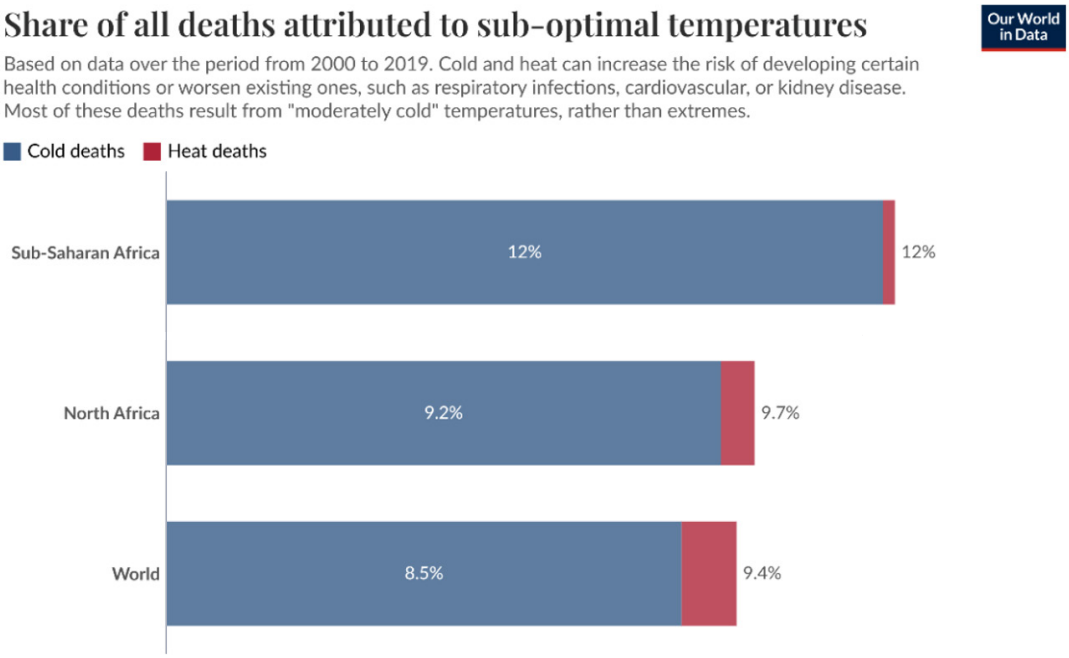
Source: Climate forecast: Looking beyond net-zero mortality predictions. Milliman.

This insight highlighted two critical areas for further research: the role of infectious disease dynamics in climate-related mortality and the need to better understand the offsetting dynamics between heat- and cold-related deaths.

Further research on heat- and cold-related deaths revealed the following key insights that need to be considered in future iterations of the model:

- Globally, cold-related deaths vastly outnumber heat-related deaths, with a similar dynamic experienced across Africa1 as seen in figure 4.
- However, heat-related mortality is likely underreported—potentially by up to 50-fold—due to misclassification and comorbidity effects2.
- Increasing global average temperatures may not necessarily offset cold-related deaths with both extremes possible - warmer global averages can still trigger regional extreme cold events, as seen in European sea ice research[3].

Figure 4: Share of all deaths attributed to sub-optimal temperatures globally and across Africa



Source: How many people die from extreme temperatures, and how this could change in the future: Part one. OurWorldinData.org.

Our research on infectious diseases highlights several critical findings:

- Pandemic events occur far more frequently than assumed by many capital models we have seen. Researchers estimate that a pandemic similar in scale to COVID-19 is likely within a span of 59 years 4.
- Climate change is amplifying infectious disease risks and the potential for future pandemics — particularly across Africa — through increased vector activity, biodiversity loss, and fragile public health infrastructure5.
- Warmer temperatures and shifting rainfall patterns create ideal conditions for vectors such as mosquitoes, bats, and rodents to thrive, increasing transmission risks[6].

While our prototype model is not predictive, it offers a valuable lens through which to explore the interconnected risks we face.

- Food- and water-borne diseases did not have a material impact on UK excess deaths; however, they could pose a greater risk in South Africa due to infrastructure and healthcare vulnerabilities.



What this means for actuaries

For actuaries, the message is clear: climate-related risk extends far beyond the immediate, first-order impacts of a changing climate. It encompasses a web of second- and third-order effects—complex, non-linear, and often volatile—that can materially influence mortality experience. Traditional modelling approaches are not equipped to capture these dynamics, so our methods must evolve accordingly.

For life actuaries, climate risk is no longer a distant concern—it is a present and accelerating challenge that is still not well understood. While our prototype model is not predictive, it offers a valuable lens through which to explore the interconnected risks we face. The task now for South African actuaries is to contextualise these insights, identify region-specific confounding factors, and build a robust understanding of the potential pathways through which climate change influences mortality.

This paper was Presented at the ASSA LAC 2025. The full research paper can be viewed here:
https://www.milliman.com/en/insight/climate-forecast-beyond-net-zero-mortality-predictions

THE IMPACT OF USAID Cuts on Mortality and Morbidity IN SOUTH AFRICA

By Brice Salence Nunes and Ishaan Singh



Head of Customer Proposition, *Old Mutual*



Business Development Manager, *Old Mutual*

Introduction

Recent announcements by the United States (US) to drastically reduce international aid are expected to have significant implications for South Africa, particularly in the realm of public health. The funding cut is being driven by aid received directly from the US government, and indirectly through a reduction from Global Healthcare Funds. This article explores the impact of these cuts, with a focus on the broader implications for group risk insurance claims.

The Scope of the Cuts

USAID has been a crucial source of funding for health programs in South Africa, supporting initiatives that combat HIV/AIDS, Tuberculosis (TB), and other infectious diseases. The recent decision to cut nearly 90% of USAID's foreign aid contracts will halt many of these programs

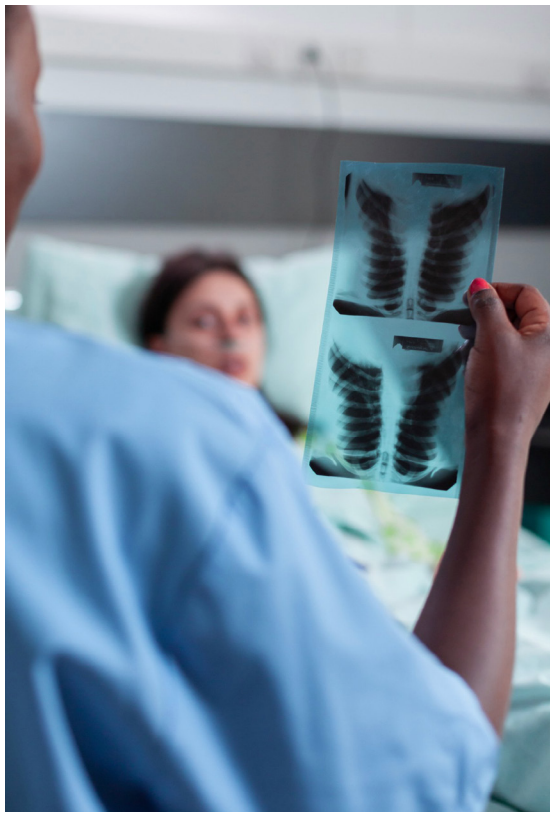
This reduction in funding is expected to have an impact on mortality and morbidity rates, particularly among the most vulnerable populations. The impact on the insured population is less clear. However, there could be impacts on group risk products which cover claims from TB and HIV related conditions.

Impact of Funding Cuts on Health Outcomes

The main impacts are expected to be focused on impacts from HIV/AIDS, TB and Maternal and Child Health. Contributions from USAID overall are modest in comparison to the overall spend. For example, 71% of the total TB budget originates from domestic sources (1), with 21% sourced from the Global Fund and 8% from commitments by the United States government. However, much of the USAID contribution is centred on strategic initiatives, which could lead to significant impacts.

In particular:

- **Tuberculosis (TB):** TB remains a major public health issue in South Africa, with the highest burden falling on lower socio-economic groups. These communities often face overcrowded living conditions, poor nutrition, and limited access to healthcare (2), all of which contribute to the spread of TB. The cuts to USAID funding will likely worsen these conditions, reducing the availability of TB prevention and treatment services. This will lead to a reduction in TB screening and diagnosis, possibly resulting in more undetected cases. Interruptions in treatment could increase the risk of individuals developing drug-resistant TB which is harder and costlier to treat. South Africa has one of the highest TB incidence rates in the world, with an estimated 615 cases per 100,000 people (2).



- **HIV/AIDs:** It is estimated that 25% of South Africa's current budget will be impacted, with 17% related to direct USAID funding(3). At present the South African government provides most of the funding for antiretrovirals and USAID funding is used to supplement this with programs that assisted with HIV testing, prevention and treatment. The impact of reduced funding/reduction in funding may lead to delayed diagnosis, loss in pre and post exposure prophylaxis support and higher transmission risks. South Africa has the largest HIV epidemic in the world, with an estimated 7.8 million people living with HIV currently (4).

Impact on Group Disability and Mortality Claims

- **TB-Related Disability Claims:** TB is not only a leading cause of death but also a significant cause of disability. In South Africa, from Old Mutual's experience, TB claims are among the top ten causes of disability on group income protection and temporary income protection products, particularly among healthcare workers who are at higher risk of contracting the disease. The reduction in funding could likely lead to an increase in TB-related disability claims, stemming from short term absenteeism due to illness and possibly from an increase in drug resistance prevalence, leading to poorer treatment outcomes. This could be exacerbated in those who have co-morbidities, such as HIV.
- **Mortality Claims:** Lower income segments could face worsening mortality experience as the treatment gap widens, and we could expect a stronger impact on funeral claims, particularly on extended family products. On group life assurance products, we may see specific industries being more vulnerable to increased mortality, particularly those with limited access to healthcare. People living in rural areas are likely to be more impacted than urban areas. Impact counter has set up a live dashboard that estimates the number of adult deaths from the time aid funding stopped. At the time of writing, it was estimated that there were 66,979 additional deaths (5). Urgent action needs to be taken to address the situation and if all services are fully restored by the end of 2025, 97,800 lives could be saved.

The Role of Medical Aid

The impact of these cuts will be felt most acutely by those without medical aid. In South Africa, medical aid schemes provide critical support for accessing healthcare

Urgent action needs to be taken to address the situation and if all services are fully restored by the end of 2025, 97,800 lives could be saved.



services. However, a significant portion of the population, particularly those in lower socio-economic groups, do not have medical aid coverage. There is also an increasing trend of employees moving to lower plans, for example hospital plans, due to affordability concerns. Employers with particularly exposed individuals, who do not have access to medical aid may be most impacted. Without this safety net, these individuals will face greater barriers to accessing necessary healthcare, potentially leading to higher rates of untreated TB and other diseases.



Conclusion

While the cuts to USAID funding present challenges for public health in South Africa, we anticipate the impact on the insured population to be minimal for now. The most vulnerable populations, particularly those in lower socio-economic groups, will bear the brunt of these cuts. While the full impact of these funding cuts remains uncertain, we remain vigilant, monitoring the insurance impact and adapt as needed. If history has taught us anything, it is that crisis often brings opportunity - an opportunity to build new partnerships, innovate, and strengthen our self-reliance.

Sources

1. *(The South African) - South Africa secures $94 million funding boost to combat TB*
2. *(PLOS One) - Predictors of tuberculosis incidence and the effects of multiple deprivation indices on tuberculosis management in OR Tambo district over a 5-year period | PLOS One*
3. *Munich Re presentation April 2025 - Impact of USAID Funding Cuts on Mortality and Morbidity in South Africa*
4. *(SA news) - Survey shows encouraging trends in HIV prevalence | SAnews*
5. *(PEPFAR Impact Counter) - PEPFAR Impact Tracker*

DO No Harm:

WHAT COULD A GENERATIVE ACTUARIAL EDUCATION SYSTEM LOOK LIKE

by Shivani Ranchod and Soshan Soobramoney





What would it mean to reimagine actuarial education—not simply as a technical training pipeline, but as a space fostering inner well-being, inclusivity, and human development in all aspects? In this deeply reflective and radical exploration, actuaries **Shivani Ranchod** and **Soshan Soobramoney** invite us into a world where excellence and collaboration can co-exist as the profession reclaims its humanity.



Interview by
Lydia Mutepfa

A 20-Year Conversation Rekindled

What began as a passing moment between lecturer and student at the University of Cape Town in 2005 has since evolved into one of the most thought-provoking dialogues in the actuarial profession today. When Shivani Ranchod took up her role as a Healthcare Lecturer, she could hardly have imagined that her student, Soshan Soobramoney, would one day become her research collaborator—reuniting years later to rethink the very foundations of the education system that brought them together.

Today, both Shivani and Soshan are actively reshaping actuarial discourse. Their recent work, encapsulated in a paper titled **"Do No Harm: What Could A Generative Actuarial Education System Look Like"** presents a radical re-envisioning of how actuaries could—and should—be educated.

"Our research is rooted in lived experience," says Shivani. "It's not just theoretical. We've lived through these systems, and we've seen both the beauty and the harm they can cause."

From Love-Hate to Purpose-Driven

Shivani and Soshan both speak candidly about their relationship with the profession in their early years. One of the epiphanies Shivani noted is how the actuarial profession is notoriously competitive, admitting some of the brightest students in the country—yet pass rates reveal that many of these high-achieving individuals often fail to meet exemption marks at an alarming rate. This highlights a missed opportunity because it implies there is only one way to think actuarially requiring every kind of student to fit a particular



mould whereas more value can be derived from appreciating the skills each student possesses in order to bring change through the actuarial profession.

Shivani and Soshan emphasise that ideally actuarial education should welcome the full spectrum of the human experience, in addition to the technical brilliance. The goal is to shift towards a strength-based model of actuarial education.

What Is a Generative Actuarial Education System?

Soshan offers a simple but powerful definition: "It's a system that creates the conditions under which people thrive." Drawing on Nancy Kline's Thinking Environment framework, the duo suggests that the actuarial classroom—and by extension, the workplace—should be a space where safety, equality, appreciation, and incisive questions unlock the best in us.

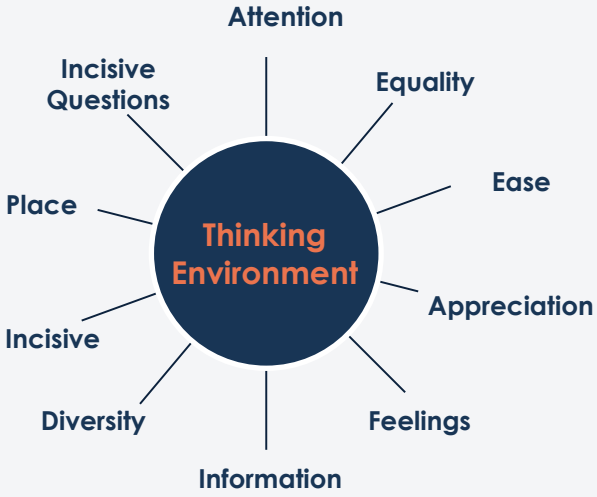
Shivani elaborates: "Traditional models often assume a deficit—that there's something missing or broken in the student if they don't present their ideas in a particular way. A generative model assumes the opposite: that everyone comes with potential, and insight."

Why Nancy Kline's Thinking Environment?

1. It offers an intuitive and intentional framework that supports a more human centred and reflective way of teaching and learning.
2. It aligns with the vision of a generative education system. The 10 components of the Thinking Environment—such as attention, equality, ease, appreciation, encouragement, and diversity—mapped directly onto the harms identified in the traditional actuarial education system.
3. It creates conditions for deep, courageous, and collaborative thinking. They have used it practically in classrooms, boardrooms, and organisational governance.
4. The thinking environment is also a diagnostic tool. Disfunction will tend to exist in different spaces, but the thinking environment brings this disfunction to the open because often times when something goes wrong, we can consider the ten steps and identify what is missing. People often don't believe in equality and this is what causes a lot of teams to be in disharmony.

From Lived Experience: What kind of strengths does this learning model highlight?

Often times, the deficit model often plays out in a race-based way replicating apartheid mentality because students from a rural background are assumed to be lacking in certain ways because of the limited resources they had. Shivani challenges this way of thinking



by asking, "What resilience does it take, to come from a rural school with no resources and still make it into actuarial science?"

One of the most compelling aspects of Shivani and Soshan's approach is their emphasis on lived experience as a source of insight. This learning model sees lived experience as a key strength in actuarial modelling that is meant for solving global problems such as climate change.

Students from disadvantaged backgrounds bring with them a depth of knowledge—about inequality, climate vulnerability, systemic failure—that is essential for the kind of actuarial work the future demands. "If you've lived through water scarcity," Shivani continues, "you'll model climate risk differently. You'll be able to think through a range of possibilities."

Soshan adds, "And beyond the analytical, we need to reawaken the emotional. The ability to feel what's wrong in the world, and imagine better, is a professional asset. That kind of insight should be cultivated, not suppressed."

Shivani goes on to emphasise the importance of integrating relational strengths drawn from collaboration, community and connection into the



learning model. Actuarial science tends to have a competitive and individualistic ethos, which can be limiting in producing well-rounded solutions.

Creating a different learning environment in the actuarial classroom: Small Shifts, Big Impact

At the University of Johannesburg, where Soshan lectures, these ideas are already being applied in practice. He describes a classroom where students co-create lecture agendas, reflect in circles, share personal intentions, and work collaboratively on complex problems. This is an environment where complex technical concepts are illustrated using relatable problems faced in South Africa. Lectures may start with rounds where everyone gets a chance to answer a meaningful question.

The assignments are more involved, allowing students to design their own lecture agendas and questions. Group tests and spot tests are the norm, ensuring that while this learning approach is relational, rigor is maintained. One striking example is the use of survival analysis to explore pass rates among students—using actuarial techniques to unpack transformation challenges in higher education.

Generativity in the Workplace

Beyond the classroom, the same thinking is being applied in the workplace. At organisations like Percept and now at Alignd, Shivani has been involved in implementing the Thinking Environment model to reshape meetings, board interactions, and decision-making structures. Shivani emphasised the rounds approach, where well-crafted questions are discussed by everyone in a collaborative manner that encourages listening and a natural building of ideas. Psychological safety is the main ideal from this model to ensure that everyone feels safe enough to contribute to the conversation.

"Solutions often come from the least expected places—like the call centre agent who sees the failure in the claims process better than anyone else" says Shivani.

Soshan adds, "We're replacing competition with the courage and humility to ask for help to learn. We're not trying to prove ourselves anymore—we're trying to enable each other to think more deeply."

Challenging the Status Quo—and the Resistance That Comes With It

Of course, disrupting established norms isn't always welcomed. Shivani and Soshan have faced resistance—from students, and peers in the profession.

"There's survivor bias," Shivani says. "Most people say, 'I made it through. Why should we change things for the next generation?'"

Soshan agrees: "Some have given feedback criticising these learning techniques as self-help, implying this dilutes the profession. But we'd argue the opposite. Generative actuarial education which facilitates growth and inclusivity are not threats to excellence—they're the conditions that make excellence possible."

Time, Rigor, and the Myth of Urgency – How would generative learning be examined optimally?

One of the boldest propositions of this learning environment is to rethink time itself.

"Why do we assume that solving a few technical questions in three hours is the best measure of actuarial competence?" Shivani asks. "In the real world, we take time. We reflect. We collaborate."

Soshan draws on his experience in postgraduate Mathematics—where examinations are untimed— a contrast to actuarial science. "There's this toxic urgency embedded in the actuarial



education system. But when people feel safe, they think better. They go beyond surface level understanding."

A Call for Collaboration—and Change

As our conversation draws to a close, I ask Shivani and Soshan if they would like to invite others to join their research journey and contribute in any ways that align with their vision. Their answer is an emphatic yes.

"This is not just our project," Shivani says. "It's a spark. We hope it becomes a blaze."

The journey toward a generative actuarial education system is just beginning. It will require courage, reflection, and a willingness to unlearn certain harmful ways. But if the work of Shivani and Soshan is any indication, it also promises to be a journey filled with hope, healing, and the rediscovery of our shared humanity.

Are you interested in contributing to this evolving conversation? Reach out to the SA Actuary editorial team or share your ideas with Shivani (shivani@alignd.co.za) and Soshan (ssoobramoney@uj.ac.za). After all, the future of our profession is one we will shape—together.

UCT ACTUARIAL SCIENCE HOUSE COMMITTEE –

Who We Are and What We Do

The UCT Actuarial Science House Committee is a group of students dedicated to creating a positive university experience for all Actuarial Science students. Our focus includes organising social events and providing academic and non-academic support.

We have a thriving mentorship programme where older students are partnered with first year actuarial science students to give them advice and mentor them.

Some notable events that occurred in the last two years were our quiz night, board games event and sandwich drive. Many students attended our events. During out quiz night, students engaged with their fellow peers from different cohorts, and had an absolute blast with good music, good vibes and good food.

The board games event was a joint event with CLAWS which is the UCT board games and RPG society. Actuarial Science students and CLAWS members came together for an evening of fun, laughter, and friendly competition. With a diverse selection of games, there was something for everyone. The event provided a perfect chance to relax, make connections, and enjoy a night filled with gaming and camaraderie.

The sandwich drive was hosted in March in collaboration with UCT ASABA Chapter. The sandwiches were donated to Ladles of Love, a South African non-profit organisation dedicated to providing nutritious meals to underprivileged communities. The event was a resounding success, with members of our respective Committees, Lecturers and Actuarial Science students coming together to prepare sandwiches in a spirit of teamwork and generosity. Beyond contributing to a meaningful cause, participants had the opportunity to connect with peers in a rewarding and engaging en

Our goal as a House Committee is to help and support our fellow students, and to give them some opportunities to enjoy a bit of leisure in their extremely busy academic careers.



Sandwich drive group photo



Sandwich drive group photo



Board games night



Quiz night

Clarity the ASSA Podcast



In a world defined by uncertainty, actuaries provide what we need most: clarity.

The Actuarial Society of South Africa is proud to present Clarity, a bold new podcast that brings actuarial insight to the forefront of today's most critical conversations. Hosted by Lucienne Fields, each episode explores how data-driven thinking and research contribute to meaningful change in society.

Episode 1 is out now!

Lucienne sits down with Imran Mahomed, CEO of ASSA, and Sandy Govender, a representative from the ASSA Research Committee, for a powerful discussion on the role of actuarial research in shaping South Africa's future.

The premiere episode explores:

- The purpose and direction of ASSA's research agenda
- Pioneering projects like the Road Accident Fund study and the South African Climate Index
- How you can play a part in driving social good through research and collaboration

"Research is going to be quite important in many, many things that we do going forward" ***- Imran Mahomed***

"The more we engage in these types of topics, the bigger influence we can have in South Africa, and beyond"
- Sandy Govender

Whether you're an ASSA member, a professional, or simply passionate about making an impact, this podcast is your invitation to join the conversation.

Stream the episode here: https://assa.net.za/io/9n *or save it for later on your Spotify playlist* **https://assa.net.za/io/9o**

BEYOND THE Numbers:

REFLECTIONS FROM AFRIC2 AT THE MAASAI MARA -

by Mukami Njeru



FIA CERA C.Act FeASK; ASSA Affiliate Member

AFRIC2—short for the 2nd Actuarial, Finance, Risk, and Insurance Congress—took place from June 8th to 13th, 2025, at Muthu Keekorok Resort within the world-famous Maasai Mara National Park in Narok County, Kenya, following a successful inaugural AFRIC in Victoria Falls, Zimbabwe, in 2023. The University of New South Wales, Australia (UNSW), was the anchor organizer, and the Actuarial Academy of East Africa (AAEA), the University of Nairobi, Kenya (UON), and the Actuarial Society of Kenya (TASK) co-hosted the event.



From the moment the last rays of sunlight faded into the acacia-dotted horizon of the Maasai Mara on June 8th, 2025, during a fabulous outdoor bush dinner, AFRIC2 was already unlike any actuarial gathering I had ever helped shape. As one of the organizers, I envisioned a congress that would not only challenge our intellectual boundaries but also immerse us in the raw beauty and complexity of Africa's landscapes. What unfolded over the next six days was a convergence of minds, cultures, and disciplines that redefined what it means to be a professional in actuarial science, finance, risk, or investment in Africa today, whether in the industry or academia—with a bias towards the role of research and education.

A Setting That Spoke Volumes

The Maasai Mara National Reserve, with its sweeping savannahs and rhythmic wildlife migrations, offered more than just a picturesque backdrop. It was a living metaphor for the themes we explored—uncertainty, resilience, and adaptation. Hosting AFRIC2 here was a deliberate choice. We wanted delegates to step out of boardrooms and lecture halls and into a space where nature itself posed actuarial questions:

- How do systems survive volatility, uncertainty, complexity, and ambiguity? Muthu Keekorok Lodge holds the distinction of being the first lodge established in the Maasai Mara. Uniquely unfenced, it offers guests

an immersive experience amidst the untamed wilderness, thoughtfully designed with discreet safety measures such as 24-hour security and well-trained local guides to ensure both authenticity and guest well-being.

- What does sustainability look like when the stakes are existential? The possibility of biodiversity loss arising from climate change impacts means that the natural wonders of the world may no longer exist in their current shape and form for future generations.

Themes That Mattered

AFRIC2 was designed to be more than a sequel; it was a statement. With over 100 registered delegates, excluding accompanying guests, from across Africa and beyond—representing at least 22 different countries and even more nationalities—this conference ignited discussions on cutting-edge actuarial innovations, AI, climate change, and risk management right in the breathtaking Maasai Mara. Panels featured international and African actuaries, finance professionals, academic faculty, development professionals, and African thought leaders discussing emerging risks, the role of actuaries in ESG (Environmental, Social, Governance), and data ethics.

AFRIC2's content and program focused on inclusivity, innovation, and impact within actuarial practice and achieved the following:

- The promotion of inclusive actuarial research that informs policy and risk solutions across sectors (insurance, health, pensions).
- The sparking of discussions on actuarial innovation in a digital and climate-conscious world.
- The initial bridging of gaps between academic, professional, and industry stakeholders.
- An understanding of Artificial Intelligence and Ethics: A conference workshop led by Dr. Samuel Chege and the team from Microsoft Kenya explored how AI is reshaping risk modeling and the ethical dilemmas actuaries and other professionals must now confront. We were introduced to the Microsoft Research Lab, whose mission is to understand, build, and deploy innovative cloud and AI technologies that address core opportunities in Africa, solve local challenges at scale, and contribute to creating a more productive future of work globally.

Keynote Speeches

Prof. Hansjoerg Albrecher's thought-provoking keynote on climate change and its implications for agriculture and seasonal patterns brought crucial insights and glimpses of possible solutions to one of our era's most pressing challenges. Prof. Andrew Cairns' analysis of socio-economic mortality disparities in the UK deeply resonated with trends across Africa—an urgent reminder for insurers to tailor products to diverse demographic needs. In tackling the issue of low insurance penetration across the continent, Prof. Gordon Phillips offered powerful strategies for boosting life insurance competitiveness. His exploration of derivative-based hedging techniques shed light on effective cost management and pricing innovation. Meanwhile, Ms. Adelaide Odhiambo illuminated the evolving landscape of microinsurance, highlighting how inclusive schemes are reshaping insurance access in underserved communities.

Panel and Working Sessions

AFRIC2 truly captured a rich spectrum of insights—from rigorous academic research to hands-on workshops. We had engaging sessions on AI, Climate Change, and GIS, led by Microsoft's Dr. Samuel (Maina) Chege, PhD, following a presentation setting the scene by George Odera FIA; and a workshop on decentralized finance

and insurance led by Prof. Jan Dhaene, Prof. Runhuan Feng, PhD, FSA, CERA, Mr. Marco Mirabella, and Dr. Rodrigue K. Roundtable discussions on topics such as "Navigating Geopolitical Shifts: Implications for Global Finance and Risk Management," chaired by Mukami Njeru FIA CERA CAct and featuring Lorainne Makwanya, Josh Collins, and Prof. Mabutho Sibanda, sparked important dialogue, alongside a teaching session hosted by Dr. Poon Leung with distinguished educators like Prof. Diana Skrzydlo, Prof. Kevin Liu (UNSW), and Dr. Joana Amorim.

Each session was anchored in African realities, and the diversity of voices—from students to seasoned professionals—created a dynamic exchange that felt both urgent and hopeful. We were particularly struck by the significant divide that exists between the industry and the academic profession in most markets, and we aim to continually bridge that gap.

Collaboration in Action

One of my highlights was witnessing the launch of the Excelerate Program for Educators, a valuable resource offering practical Excel skills training at no cost to eligible participants, led by Prof. Kevin Liu, the Associate Dean of Undergraduate Programs at the UNSW Business School. It's wonderful to see Andrew Ngai, the World Excel Champion, also contributing to the program's sessions; he previously presented at an AAEA masterclass. The program details are available here: [Excelerate Program](https://lnkd.in/dZGfUQZM).

The Mara Effect

Of course, no account of AFRIC2 would be complete without acknowledging the Mara itself. Between sessions, delegates embarked on guided game drives, where conversations about mortality tables gave way to awe at which of the big five had been spotted and how close to the wildebeest migration spot delegates had ventured. A gala dinner graced by Narok County officials and a showcase of authentic musical expressions that brought the diverse crowd even closer was a reminder that behind our models and metrics are human beings—curious, creative, and deeply connected to the world we seek to understand.

Personal Reflections

Organizing AFRIC2 was not without its challenges. Coordinating logistics in a remote location, balancing academic rigor with experiential learning, and ensuring inclusivity across language and background required constant negotiation. But it also reaffirmed my belief that actuarial science, when rooted in context and community, can be a force for transformation. As I watched delegates depart on June 13th, many exchanging contacts and promises to collaborate, I felt quietly invigorated. We had not just hosted a conference—we had sparked a movement.

Some Key Learnings and Insights

- Inclusivity requires intentional strategy: Building a diverse actuarial ecosystem in Africa means targeting underrepresented communities, offering financial support, and nurturing homegrown research.
- Data is the actuary's currency: The shift to data-centric problem-solving in climate change modeling, inclusive insurance, and government policy is creating new roles for actuaries in Africa.
- Bridging academia and practice: AFRIC2 emphasized the importance of aligning university programs with real-world risks.
- Resilience through collaboration: Institutions like AAEA, together with regional and global partners, are crucial for creating structures that develop future-ready actuaries. AFRIC2 re-

vealed the depth of untapped actuarial potential in Africa. The AAEA is a transformational force shaping the future of insurance and resilience in the East African region and has been adopted as a use case for the establishment of AADA—the African Actuarial Development Academy. Events like AFRIC2 validate its model and point toward a future where African actuaries are pivotal in solving African challenges in a local context based on robust research and in collaboration with academic professionals.

Looking Ahead

The success of AFRIC2 has already prompted discussions about AFRIC3, with Marrakesh, Morocco, envisioned as the location for the next AFRIC. More importantly, it has established a precedent: that actuarial gatherings can be immersive, interdisciplinary, research-based, and unapologetically African.

Words of Acknowledgment

We extend our heartfelt thanks to all AFRIC2 participants for making this an unforgettable experience. The exceptional presentations—delivered to a gracious and thoughtful audience—created a unique and enriching space for networking and collaboration.

A special note of appreciation goes to our generous sponsors: UNSW Sydney (Bernard Wong), Microsoft (Dr. Samuel Chege), The University of Toronto (Andrei Badescu), the AFIR-ERM and IACA Sections of the International Actuarial Association (Alexander Bohnert, George Symonds), The Society of Actuaries (Andy Peterson), and The Actuarial Society of South Africa (Michael Tichareva), as well as to our host Jonathan Zivieyi and our co-hosts: The Actuarial Academy of East Africa (Mukami Njeru), The University of Nairobi (Prof. Patrick Weke), and The Actuarial Society of Kenya (Mr. George Odera)—your support made AFRIC2 a reality. To my fellow organizers, speakers, and delegates—thank you for trusting the vision. To the Actuarial Association of South Africa, thank you for amplifying our story. And to the Mara, thank you for reminding us that even in the wildest uncertainty, there is beauty, order, and meaning.

- **AFRIC** is a premier academic conference, bringing together academics and practitioners with research interests across all specialty areas of actuarial science, finance, risk management, and financial system regulation; and aims to enhance the research culture within Africa's actuarial community.
- **Muthu Keekorok Lodge** is a historic safari retreat nestled within Kenya's Maasai Mara National Reserve. Established in 1965, it holds the distinction of being the first lodge built in the reserve, offering guests an immersive experience amidst the African wilderness. Surrounded by 700 square miles of lush sun-drenched plains, Keekorok Lodge is right in the heart of the Maasai, where you can enjoy the sights of hippos and zebras grazing near the lodge. Keekorok Lodge is an eco-friendly and conservation-committed lodge that serves the Maasai Mara and supports the mission of the Global Alliance of National Parks.
- **[Microsoft Research Lab Africa]**(https://www.microsoft.com/en-us/research/lab/microsoft-research-lab-africa-nairobi/)

Introducing ASSA Abroad:

A NEW WAY TO STAY CONNECTED FROM ANYWHERE IN THE WORLD -

by Dylan Ascough



FASSA, FIA C.Act - Head of ASSA Abroad UK

What is ASSA Abroad?

ASSA Abroad UK is an initiative designed to help South African actuaries and students who are living in the UK stay connected with ASSA, continue their professional development, and build a sense of community wherever they are.

Whether you're a student navigating Work-Based Learning (WBL), a newly qualified actuary still finding your feet, or an experienced FASSA looking to give back and stay engaged, ASSA Abroad UK is a community to support your journey.





Our First Event – London

We recently hosted our meet and greet ASSA Abroad UK event at a venue in London's bustling insurance district. With around 20 attendees, it was a fantastic evening of introductions, fun, shared stories of surviving the UK winter, and our experience of working in the UK as South African actuaries.

While the setting was informal, the energy in the room showed just how valuable this kind of gathering can be. We're already looking forward to the next event and growing this into a strong, supportive network which will continuously aim to be a blend of professional development and fostering our community.

One of our attendees, Ashley Dawkins, shared their experience:

"I've enjoyed meeting and socialising with the South African actuary community in the UK, but what stands out to me about ASSA Abroad UK is the added professional focus. It's great to see something that helps bridge the gap between ASSA and its members abroad. I've been in London for about two and a half years, and it's great to be part of a community that supports each other, your career, and your connection to home. I'm excited to see where this community goes."

How to Join or Start Your Own Chapter

ASSA Abroad UK is just the beginning, it would be great to see similar chapters spring up in other parts of the world. If you're an ASSA member based abroad and interested in starting a community in your region, please reach out! We're happy to share our experience and help you get started.

To join ASSA Abroad UK, get involved, or discuss launching your own chapter, feel free to contact me directly at **dylan@truesouth.co.za**. Let's build a global community that brings South African actuaries together, no matter where in the world we are.

ASSA CEO

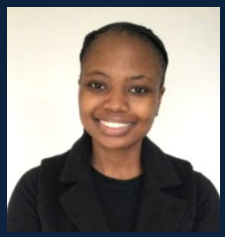
Imran Mahomed

PROFILE



Imran Mahomed, the CEO of the Actuarial Society of South Africa (ASSA), is an entrepreneur, educator and truly an actuary of note. With over two decades of experience spanning traditional actuarial work, product innovation, and executive leadership, Imran brings a rare combination of technical depth, business insight, and value-driven leadership to Actuarial Society of South Africa.

by Lydia Mutepfa



Before being appointed CEO in July 2024, Imran served as ASSA's Education Executive and played a critical role in transforming actuarial education, mentoring students, and strengthening partnerships with universities. His leadership is rooted not only in technical excellence and innovation, but in humility, curiosity, and a deep appreciation for diversity. As CEO, he champions innovation, transformation, and a forward-looking professional identity—ensuring ASSA remains relevant, inclusive, and globally respected.

Imran's journey is a compelling example of how purpose, adaptability, and values can redefine success and leadership.

One year in....

I recently had the privilege of having a virtual conversation with Imran Mahomed to learn more about his journey—what has shaped him into the leader he is today, the milestones he's reached, and the values that guide him.

One message that may resonate strongly with all members of ASSA is this:

> "What has inspired me most is the extraordinary spirit of volunteerism within our profession. I believe we are one of the most volunteer-driven actuarial societies—not just in South Africa, but globally. The level of commitment, time, and skill that our members dedicate to the profession—often on top of demanding day jobs—is truly humbling."

This sentiment, like so many others he expressed, reflects not only his deep humility but also his genuine appreciation for those around him. I believe this underpins his drive to keep contributing to society in ways that make a difference.

What inspired you to choose actuarial science?

To be honest, I stumbled into the actuarial profession by mistake. Like many families, mine had a wise and accomplished uncle—someone ahead of his time—who played a key role in shaping my early thinking about careers. He suggested actuarial science as a prestigious and promising field.

Like many aspiring actuaries, I performed well academically and had multiple options. I considered chemical engineering, but a site visit involving climbing a tall silo quickly ruled that out.

The turning point came when I shadowed someone in the actuarial space. What fascinated me was their broad business involvement in delivering presentations, making strategic decisions, marketing, and much more. It all seemed so dynamic and planted a seed in me.



Years later, after navigating the long and often challenging path of qualification and professional experience, I eventually found myself in that very space of leadership and influence that had first captured my attention. Looking back, I'm incredibly grateful for the journey. Though it began almost by accident, it's been deeply rewarding and meaningful.

Curiosity fuels a desire to continuously learn and to deeply understand the work one engages in. Without it, challenges can quickly become overwhelming, and work may start to feel burdensome.

Although your early experience in the profession didn't match what you initially envisioned during job shadowing, you remained committed and didn't become disillusioned. What helped you stay the course and continue to find value in the work?

Over the years, I've had the privilege of meeting many different types of actuaries. The kind I admire most—and the one I believe is most likely to thrive—is the actuary who is curious. Curiosity fuels a desire to continuously learn and to deeply understand the work one engages in. Without it, challenges can quickly become overwhelming, and work may start to feel burdensome.

But when you're curious, every problem becomes an opportunity—a chance to explore and solve, rather than a reason to avoid the work. I consider myself fortunate to have carried a little bit of this sense of curiosity throughout my career. I've come to believe that the value you derive from your career is largely shaped by your perspective.

You've held a wide range of roles throughout your career. What unique perspective has that wealth of experience given you?

One of the greatest lessons I've learned is that there is immense value in diversity—both in people and in professional experiences. I've had the privilege of working across many environments and interacting with many different individuals, each leaving a lasting imprint that has impacted me greatly.

For example, my career began as I interned with Momentum during my university holidays. This is where I was exposed to innovative work that would only gain prominence years later. Being part of such projects in their formative stages was incredibly exciting.

Over time, I've come to appreciate the importance of technical depth. To communicate complex ideas simply and clearly, you must first understand them deeply. That's something I see as a key part of the actuarial journey, and I would almost say there are some building blocks that may form part of one's experience in the actuarial space.

The actuarial journey is one often starting with great confidence just after university, then facing the humility of realizing how much you don't know, pushing through the discomfort of that learning curve, and eventually reaching a point where you're not just applying knowledge but improving on it.

Another key leadership lesson I've learned is the importance of knowing when to do things myself and when others are better geared at doing certain things. Early in my career, I needed to do everything myself. With time I appreciated how others often bring unique strengths, and the greatest

results come when you create space for everyone to thrive. Today, I find more joy in seeing others do amazing things.

Creating an environment of psychological safety—where people feel confident to take ownership—has been one of the most rewarding aspects of leadership. If you're trying to achieve something meaningful, it's often the people around you who will take you there. That said, knowing when and how to trust as an actuary isn't always easy—it goes against the grain for many of us—but it's a necessary and powerful part of our professional growth.

Your entrepreneurial journey is nothing short of brilliant—particularly how you successfully ran a fast-growing multi-national Insurtech business that you founded. What motivated your career shift?

In the early part of my career, I was particularly drawn to the creative process behind product development. It was exciting to build something from the ground up and see it succeed in the market. As my career progressed, I found myself increasingly drawn to the broader aspects of business management.

While product development remained part of the picture, my focus expanded into solving deeper, more systemic problems - particularly the challenge of serving the uninsured. I was so driven by the need of the uninsured for affordable cover and how we could develop a product that met this need. The work I did always carried a strong sense of purpose in that sense. It ultimately involved coordinating across multiple functions: technology, IT, strategy, and operations. The environment was fast-paced and deeply fulfilling.

However, my decision to shift focus wasn't purely professional—it was deeply personal and spiritual. Over time, I began to reflect more on what purpose and success meant to me. I questioned whether the path I was on aligned with my values. I found myself asking important questions: Was I spending enough meaningful time with my family? Was I living in alignment with my beliefs and conscience? What did I truly want my impact to be? All these considerations coupled with my religious grounding led to a more enlightened perspective. I certainly believe everyone forms their definition of purpose and success differently as they go through life.

Those reflections led me to reconsider what I had been prioritising and what I might have been sacrificing along the way. Around that time, I reached out to a friend, Professor Steven Jurisich at Wits University, who had also made the move from business to academia. Our conversation helped me realise that it was okay to choose a different path—one where I could contribute more meaningfully to others in a way that aligned with my core values.

That's how I found my way into lecturing. I had done sessional lecturing for many years and always loved engaging with students. There's something incredibly rewarding about being part of someone's growth journey, even in a small way. That naturally evolved into a desire to get more involved with the Actuarial Society of South Africa (ASSA).

I've always believed that our profession has incredible potential—South Africa has long been a source of innovative thinking and practical solutions. I wanted to play a part in ensuring that we remain forward-looking and adaptable. I initially got involved by coordinating the professionalism course.

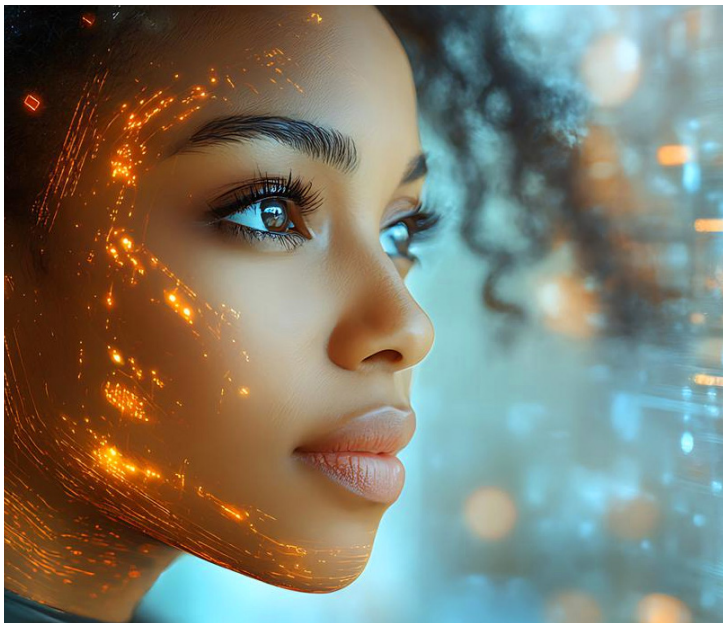
Then, after some conversations with Mike McDougall, we agreed there was room for me to contribute more broadly to the Society—and that's how my journey with ASSA in a leadership capacity began initially serving as the Education Executive.

One of the most authentic aspects of your leadership journey is how intentional you've been in pursuing work that holds deep meaning, purpose, and intrinsic value. How have your values influenced the way you make decisions?

I've found that making decisions becomes much easier when you're clear about what you value. When challenges arise, it's tempting to focus purely on outcomes, but outcomes alone are not always enough to guide meaningful or sustainable choices. Holding firmly to your core values allows you to approach problems with a broader, more holistic mindset. It also opens up different paths to challenge resolution—paths that are more aligned with who you are and what you believe in.

It's especially important to reflect on purpose early in your career. Those who discover their "why" sooner tend to align more naturally with fulfilling work. As you grow and gain new experiences, what you value most may evolve—and that's not failure; that's growth.

For me, this clarity didn't come overnight. It took years of learning, reflection, and yes, a fair share of mistakes and scars. Experience is an exceptional teacher, though often an expensive one. Sometimes you can grow by reflecting on others' journeys, and other times,



you have to walk through the experience yourself to fully appreciate its lessons.

As you reflect on your first year as CEO of the Actuarial Society of South Africa, what opportunities do you see emerging for the actuarial profession?

One of the most significant opportunities lies in how we engage with evolving technologies—especially AI and data science. I firmly believe that actuaries who understand how these tools work and how to apply them meaningfully will be better positioned over the next decade than those who do not. It's not just about using these tools—it's about appreciating the mechanics behind them, understanding where bias may arise, and using that insight to make more effective and ethical decisions.

To stay relevant, we need to be forward-looking and deliberate about integrating future-facing skills into our current education and professional development pathways. Research plays a critical role in this. It gives us the ability to anticipate rather



than react—to see which capabilities will be essential five or ten years from now, and to begin building them today.

This mindset of proactive evolution is not new to South Africa. One of the reasons the actuarial profession in this country built a global reputation in healthcare decades ago was because we had the foresight to invest in relevant innovation. Similarly, we've made significant inroads in banking. When I first entered the profession, the dominant spaces were life and pensions. While those fields still hold value, we're now seeing the actuarial footprint expanding further—particularly in banking and risk.

Even more exciting are the non-traditional spaces where actuaries are being recognised: from aerodynamics to companies like Uber and Tesla, where actuarial modelling is applied in innovative ways. The profession is evolving, and the scope of our relevance is widening.

To keep pace, we must remain open to research, embrace interdisciplinary thinking, and above all, be willing to adapt. Embracing change isn't a threat to the actuarial profession, it's the very thing that will sustain and expand our impact.

Based on your experience as a leader across various capacities, do you believe there are any skills gaps that still exist within the actuarial education pipeline?

From a technical standpoint, I wouldn't say there are major fundamental gaps—we have a solid foundation. However, there is a gap at the foundational level when it comes to AI and machine learning. While we teach strong statistical concepts, such as GLMs and stochastic processes, I believe there's a missing appreciation for how neural networks, large language models (LLMs), and modern decision-making algorithms work.

Understanding these tools at a conceptual level is no longer enough. We need to develop the ability to build and tailor models to solve specific problems—rather than simply consuming off-the-shelf solutions. This is critical if actuaries are to continue providing meaningful insights in a world of increasing complexity.

If I reflect on the profession 20 years ago, actuaries were often at the frontier of working with complex models. But today, in some areas, that edge has shifted—particularly as fields like data science and engineering have evolved rapidly. To remain competitive and relevant, we need to embed that complexity and adaptability into our curriculum and be intentional about how we apply it in an ever-changing world.

I don't believe these gaps are insurmountable. The core is strong—we simply need to supplement it appropriately. Beyond technical areas, I see a growing need for actuaries to develop skills in behavioural analytics, big data interpretation, and, importantly, the ability to collaborate across disciplines.

We need actuaries who can quickly learn the nuances of other industries, communicate effectively with professionals from different fields, and lead interdisciplinary projects. Building this general awareness and adaptive thinking will allow us to expand our influence and relevance beyond traditional actuarial domains.

Reflecting on your first year as CEO of the Actuarial Society of South Africa, what have been some of the highlights?

This past year has been both busier and more rewarding than I anticipated. One standout moment was attending the International Actuarial Association meeting in Brazil, where I was struck by how many of the challenges we face in South Africa are shared by actuarial societies around the world. However, given our relatively small size as a professional body, what's remarkable is that we often manage to tackle several of these challenges simultaneously.

In every sense, our volunteers are the lifeblood of our profession. This exemplifies the values we strive for—commitment, collaboration, and purpose—and I feel incredibly privileged to work alongside such passionate and capable individuals.

Whether it's offering tutoring in mathematics, providing pro bono actuarial services in complex legal cases, or contributing to research and education initiatives, our volunteers continuously show up with excellence and generosity. Their contributions have made it possible for us to achieve a great deal this past year.

I've also been deeply encouraged by the openness to change I've seen from both the team at ASSA and the broader membership. The willingness to adapt and engage has made my transition into the role far smoother and more impactful than I could have hoped.



How do you unwind or recharge outside of work?

In earlier years, I used to unwind by reading—a book a day. These days, life is a bit fuller, so I tend to listen to audio books instead, which allows me to keep learning while on the move.

I also have four children, each at different stages of life, so being present and involved with them is a big part of how I recharge. It keeps me grounded and connected in meaningful ways. I occasionally spend time on social media, keeping up with what's happening in the world, and I've also started being a bit more intentional about exercising and staying active.

Lately, I've been trying to step outside of constant reflection and instead focus on simply being present in my environment—enjoying nature, moments with family, and quiet time away from work. Taking proper time off and creating space to reconnect with loved ones has become especially important to me after intense periods of professional activity.

It's a work in progress, but I've found that creating balance in small, intentional ways makes a big difference.

From Social Work to Actuarial Expert:

JASMIN VAN SCHALKWYK'S INSPIRING JOURNEY



Jasmin Van Schalkwyk

In a profession defined by precision, rigour, and responsibility, **Jasmin van Schalkwyk** stands out not only for her technical excellence but also for her humility, resilience, and purpose-driven leadership. A qualified actuary, Practising Certificate holder, and member of the Actuarial Society of South Africa's Council, Jasmin's career journey is anything but conventional — and all the more inspiring because of it.

by Nabeelah Kolia





Fourteen years later, Jasmin eventually qualified as a Fellow of the Institute and Faculty of Actuaries (IFoA) — **a moment that marked not just a milestone, but a testament to grit, resilience, and a deep commitment to personal growth.**

Finding Her Way to Actuarial Science

Jasmin did not set out to become an actuary. In fact, she initially enrolled in a social work degree, driven by a passion for social upliftment. But during her third-year casework placements, she realised that while the purpose aligned with her values, the work itself didn't feel like the right fit. She left university and entered the workforce, taking on a role as an admin clerk at a large insurer.

It was there that she first encountered the actuarial profession — and something clicked. With a natural aptitude for numbers and an intellectual curiosity, Jasmin began pursuing actuarial studies through correspondence. At the time, her aim wasn't even to qualify — she simply wanted to set a strong educational example for her daughters. But what began as a personal milestone slowly turned into a professional calling.

The lengthy period required to qualify as an actuary posed significant challenges, especially as Jasmin balanced her studies with raising her three daughters. However, she describes the environment at her workplace, filled with like-minded actuaries preparing for exams, as a pivotal source of motivation. Additionally, the unwavering support from her family fueled her determination to complete her studies despite periods of demotivation.

Fourteen years later, Jasmin eventually qualified as a Fellow of the Institute and Faculty of Actuaries (IFoA) — a moment that marked not just a milestone, but a testament to grit, resilience, and a deep commitment to personal growth.

From Actuary to Head of Actuarial Function

Today, Jasmin holds both Life and Microinsurance Practising Certificates and is the Head of Actuarial Function (HAF) for one South African insurer and the Statutory Actuary for another insurer outside of South Africa. Interestingly, becoming a Statutory Actuary/HAF was never part of her original plan.

"I always saw the HAF role as something up there — something for other people," she says. "But over time, my career evolved. I moved into reporting roles, took on more responsibility, reviewed results, and engaged with senior stakeholders. It started happening organically."

After a period of independent consulting, Jasmin joined True South Actuaries & Consultants, where she found not only professional alignment but also support and encouragement to pursue her Practising Certificate (PC). With guidance from two sponsors — colleagues who had worked closely with her — she successfully applied for and received her PC, and soon after, took on her first statutory appointment

Learning from the Best

While Jasmin credits many colleagues and sponsors for supporting her journey, one mentor stands out as having had a lasting impact: Johan Lotz, a former colleague.

"I probably learned more from him than anyone else," she shares. "He was technically strong, but what stood out most was how he could look at things from multiple perspectives, tell a compelling story with numbers, and engage with stakeholders across the board — all while being highly respected by actuaries and non-actuaries alike."

Working closely with Johan shaped not only Jasmin's technical thinking but also how she approached leadership, communication, and business strategy. Through this relationship, she saw what it meant to be more than just technically competent — to be trusted, influential, and genuinely valuable to a business.

It's a lesson she carries forward in her own interactions today. Jasmin now finds herself naturally stepping into that role for others — modelling what was once modelled so powerfully for her.

Leading with Integrity

As a HAF, Jasmin is clear-eyed about the challenges. "You're required to bring material issues to the attention of the board — even those that may reveal weaknesses in practices or internal controls. That's never easy," she says. Her approach is grounded in collaboration and professionalism: engaging management first, seeking clarity, and ensuring everyone is aligned before issues are escalated. This, she believes, maintains the integrity of the role without compromising relationships.

The importance of storytelling — especially when engaging non-technical stakeholders — is another theme she emphasises. "Being able to tell a story with numbers is key. It's not just about the calculations; it's about what they mean and why they matter."

Giving Back Through Actuarial Society of South Africa (ASSA)

Jasmin's contributions go well beyond her client work. She currently serves on the ASSA Council, chairs the Operations Board, sits on the Life Assurance Committee (LAC) as Council's representative, and leads the Actuaries Without Frontiers (AWF) initiative — a programme close to her heart.

AWF aims to harness actuaries' desire to make a social impact and connect it to real needs on the ground. "There's a strong interest among our members to uplift and contribute. AWF is about turning that energy into meaningful action," she explains.

Find out more about AWF *(Actuaries Without Frontiers)*



I know this won't be forever. But for now, it's an opportunity to make an impact and contribute.

Through her involvement in ASSA structures, Jasmin has gained deep insight into the profession's challenges, strategies, and positioning compared to global bodies — perspectives that continue to shape her approach to leadership and governance.

Time, Tools, and Tenacity

Balancing her professional, ASSA, and personal commitments is no easy feat. Jasmin credits supportive employers, personal discipline, and the intelligent use of technology — particularly AI tools like ChatGPT and Copilot — with helping her manage it all. "AI helps me grasp the big picture quickly so I can engage more effectively. It's been a real time-saver," she shares.

And yet, she's clear that the sacrifices — including giving up some personal time — are temporary and purposeful. "I know this won't be forever. But for now, it's an opportunity to make an impact and contribute."

Words of Advice: Purpose, Persistence, and Professionalism

For aspiring actuaries — and especially those with an eye on becoming a Head of Actuarial Function (HAF) — Jasmin's message is clear: know your strengths, stay curious, and never lose sight of why you started.

"Work takes up most of our waking hours," she says, "so you have to enjoy what you do. Understand what energises you — whether it's technical work, stakeholder engagement, or social impact — and lean into that."

She emphasises the importance of technical excellence, particularly for those pursuing a practising certificate. "You can't be an effective HAF if you're not technically strong. It's the foundation," she explains. But beyond that, it's about seeing the bigger picture — communicating clearly with non-technical stakeholders, understanding risk in all its forms, and offering assurance that boards can trust.

For Jasmin, the HAF role is about far more than signing off results. It's a position of trust, influence, and accountability — one that often shapes strategic decisions within a business. That's why integrity matters just as much as intellect.

And her biggest lesson? Don't be intimidated by complexity. Whether it's tackling a new reporting standard like IFRS 17 or balancing professional responsibilities with family life, Jasmin's career has taught her the power of persistence.

"You don't have to have all the answers on day one," she says. "You just have to stay engaged, ask questions, and keep going — even when it feels hard. That's how things start to fall into place."

A Career with Purpose

Jasmin's story is a powerful reminder that careers don't have to follow a straight path to be successful. With purpose, persistence, and a willingness to grow — even through discomfort — meaningful contributions can emerge in unexpected ways.

In an industry built on numbers, Jasmin brings something rarer: conviction, courage, and compassion. And perhaps most powerfully, she's shown her daughters — and the profession — that there's more than one way to lead.

What is a practising Certificate (PC) and HOW DO I APPLY FOR ONE?

PCs demonstrate that the actuaries who hold them are fit and proper and have the necessary skills and experience to be a PC holder and potentially to carry out reserved work, thereby protecting the public interest.

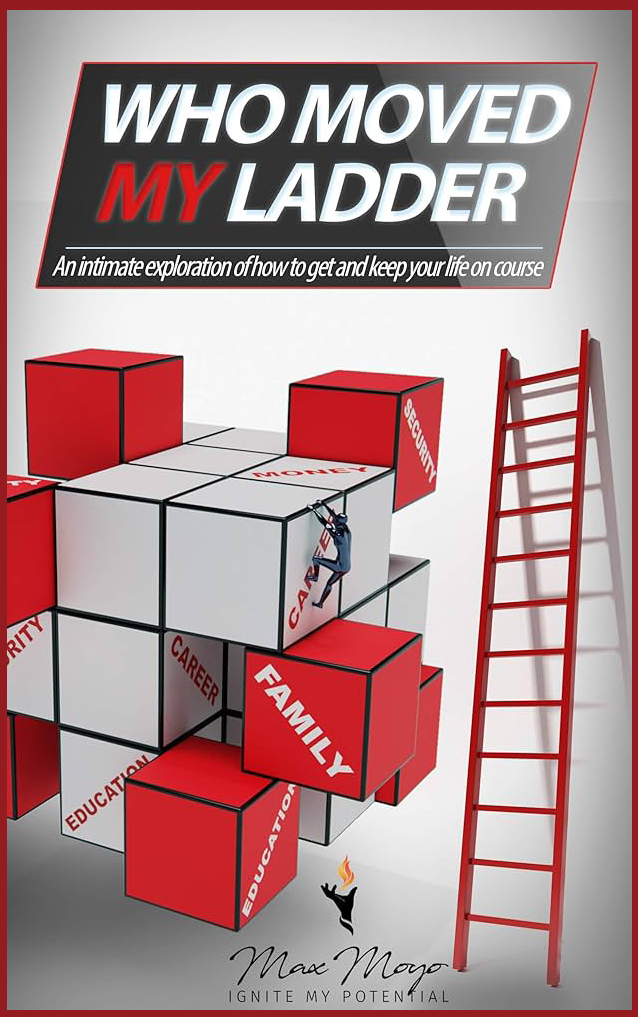
PCs are available in Life Assurance, Healthcare, Short-term Insurance, Retirement Funds and Microinsurance.

If you want more information on the requirements for obtaining a PC.

CLICK HERE

BOOK REVIEW

Who Moved My Ladder? *by Max Moyo*



Reviewed by
Michelle Abrahams



ASSA Member Engagement Executive

In a world where career ladders are often assumed to be linear, stable, and predictable, Max Moyo's "Who Moved My Ladder?" invites a bold rethinking.

Through a blend of personal insight, parables, and practical wisdom, this powerful little book delivers a timely reminder: progress is rarely a straight line, and success is as much about self-awareness and agility as it is about ambition and skill. On a personal note, I read this book in my own context, as well as in the context of the SA Actuary audience, and it came at just the right time for me. With a clear focus on ASSA member experience and in managing the ASSA Personal Development (APD) portfolio, it has made me more aware of how many members are navigating moments of change or re-evaluating what success means in a shifting world. Moyo's message is a powerful reminder that we are allowed (and sometimes required) to pause, pivot, and redefine the ladder itself.

Moyo is a respected speaker, leadership coach, and thought leader in the space of personal transformation and he uses the metaphor of the "ladder" to question the assumptions many professionals carry about growth, achievement, and identity. Rather than chasing the next rung without reflection, Moyo challenges us to ask deeper questions: Is this even my ladder? What do I define as success? Who am I becoming in the climb?

Written in an accessible and conversational tone, the book resonates strongly with South African individuals in structured professions, actuaries among them, where achievement is often measured by milestones, exams, or titles. Moyo doesn't dismiss the value of these accomplishments, but he does caution against confusing them for purpose. He writes with urgency and compassion, urging readers to reframe uncertainty not as disruption, but as invitation to pivot, to rediscover, and to lead with intention.

"Sometimes your ladder is moved not to punish you, but to remind you that you were meant to build something new and not just climb something old."

Max Moyo, Who Moved My Ladder?

What makes Who Moved My Ladder? particularly relevant to actuaries today is its focus on personal leadership in a changing world. As the profession evolves beyond traditional roles, actuaries are being called to think more broadly, show up more fully, and lead more authentically. Moyo's message is clear: don't just climb, check out the ladder first and choose your climb.

As we look ahead to Max Moyo's flagship ASSA Personal Development (APD) talk at the upcoming ASSA convention, entitled: "Calculation to Contribution: Unlocking the Power of Personal Impact", this book offers a valuable pre-cursor for the kind of conversation he will no doubt provoke: one about growth, identity, courage, and impact. If you're feeling stuck, off-course, or simply wondering about what's next for me, *Who Moved My Ladder?* may be the wake-up call you didn't know you needed.

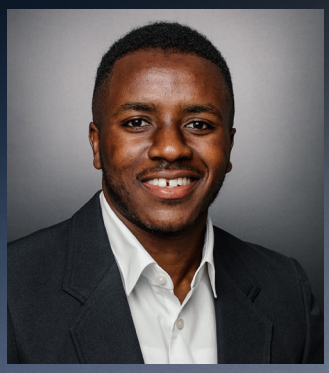
About the Author

Max Moyo is an internationally recognised thought leader, motivational speaker, and founder of Ignite My Potential. With a background in leadership development and personal transformation, he has worked with executives, entrepreneurs, and organisations across Africa and beyond to awaken purpose, clarify vision, and catalyse meaningful change. Known for his dynamic speaking style and deeply human approach, Moyo is passionate about helping people reconnect with their true potential. He is also the author of 3 other books and a frequent keynote speaker at leadership summits, business forums, and professional conventions.

STABLECOINS AND THE FUTURE OF INCLUSION:

An Actuarial Lens on Digital Currency in Africa

by Kuzivakwashe Kurehwa





Currency Instability, Financial Exclusion, and a Digital Turning Point

Patterns in African financial behaviour reveal a consistent reality: where traditional banking fails, people innovate. From informal savings circles (stokvels) to mobile money, financial solutions thrive when they are trusted, flexible, and culturally embedded. My background in actuarial science has sharpened my lens for spotting these shifts, not just to observe risk, but to help design systems that manage it for good.

Over the past few years, Africa has seen the seemingly quiet but significant emergence of a new financial rail: stablecoins. These blockchain-based digital currencies—pegged to fiat—offer mobile money's speed, hard currency's stability, and software's programmability. And in contexts where inflation, banking fees, and border restrictions persist, their rise could be transformative.

This article explores why stablecoins matter for Africa, what use cases are emerging, and how actuaries can help ensure their adoption is ethical, scalable, and sustainable.

What Are Stablecoins, and Why Are They Gaining Ground?

Stablecoins are cryptocurrencies designed to maintain a stable value, most pegged 1:1 to a fiat currency. Unlike volatile crypto assets like Bitcoin or Ethereum, stablecoins such as USDC or USDT offer a predictable store of value that can be easily transferred, stored, or used for transactions.

For many Africans, the appeal is clear:

Instant settlement: Payments confirmed in seconds.

Borderless: A freelancer in Ghana can be paid securely and affordably by a client in Canada.

Accessible: Anyone with a smartphone and data connection can receive or hold stablecoins—no bank required.

While global volumes in stablecoin transactions are soaring, Visa recently reported over $225 million in USDC settled via its rails in the Central and Eastern Europe, Middle East, and Africa (CEMEA) region. In Africa, adoption is still emerging, but it is doing so fast.



Why Stablecoins Make Sense in Africa

Demand for USD is Soaring.

Reliance on the dollar is nothing new in countries like Zimbabwe, Nigeria, and the DRC. However, access remains informal and risky, with physical notes hoarded or traded at premiums. Stablecoins offer a safer alternative: digital dollars with traceability, convertibility, and programmable potential.

Cross-Border Trade Needs Smoother Rails.

Intra-African trade is only 14.4% of the continent's global trade. Fragmented payment networks, foreign exchange (FX) bottlenecks, and high transfer costs choke small businesses. Stablecoins can settle payments in real time, without correspondent banks or high FX spreads. For SMEs, this could shift the economics of working capital entirely.

Mobile Money Isn't Enough.

Africa has over 550 million mobile money users, but most wallets are limited by national rails. Stablecoins could layer over these wallets and enable cross-border interoperability through familiar tools like WhatsApp, without needing new apps or bank accounts.

Actuaries: Architects of Digital Trust in Stablecoin Systems

This is where we come in as actuaries—not just as technicians, but as designers of resilient financial systems. Actuaries have always worked at the intersection of finance, risk, and social impact. Stablecoins introduce a new layer for all three.

Here's how our role is evolving:

1. Designing Inclusive Financial Products

Stablecoins open the door for actuarial innovation in microfinance, savings, and lending. Actuaries can:

- Price and manage blockchain-based community savings pools with auditable smart contracts.
- Design unit-linked wallets or micro-investment platforms embedded in mobile apps.

2. Risk Modelling in Unfamiliar Terrain

This isn't just about default risk anymore. It's about:

- Smart contract failure risk
- Liquidity mismatch in custodial stablecoin systems
- Counterparty risk in decentralised finance (DeFi)

Actuaries are equipped to build operational risk frameworks that assess volatility beyond markets, into code, custody, and protocol-level events.

3. Enabling Stablecoin-Based Insurance.

From crop to credit life to travel, insurance can now be:

- Priced in local currency
- Paid in stablecoins, for example, USDC
- Settled instantly via mobile wallets

Actuaries can build the tariff structures, determine capital requirements, and test sustainability scenarios for these digitally settled products—especially critical in low-income markets where affordability and speed determine uptake.

4. Quantifying Social Impact:

NGOs and donors are piloting stablecoin-based disbursements for aid and remittances. But what is the long-term impact? Here, actuaries can:

- Model behavioural changes in savings and spending
- Track reduction in "leakage"

- Quantify policy outcomes using metrics like cost per dollar delivered or time-to-disbursement

5. Regulatory and Captive Use-Cases.

In Bermuda, captive insurers hold stablecoins for premiums, claims, and capital, under-regulated caps of up to 25%. Actuaries play a vital role here, designing capital buffers, stress-testing reserves, and embedding solvency rules into on-chain infrastructure.

6. Blockchain Insurance Pools.

In a pilot between Aon and Nayms, premiums and claims are handled entirely via stablecoins in smart contracts. Actuaries help architect the underwriting cells, set pricing rules, and calibrate reserves inside open ledgers.

The Leapfrog Moment: WhatsApp, Stablecoins, and Actuarial Infrastructure

Kenya's M-Shwari proved that mobile micro-savings can reach tens of millions. The US-based Acorns showed that investing can start with spare change. But the rest of Africa doesn't need to replicate these—they can leapfrog.

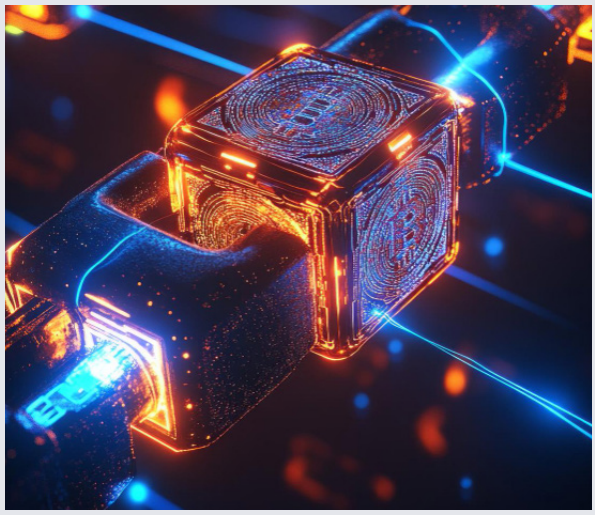
What if stablecoins powered community stokvels, with actuaries modelling pooled longevity and return potential? What if WhatsApp became a fully functional decentralised financial assistant, where savings, insurance, and payments lived in one flow?

These aren't far-fetched. But they do need:

- Ethical pricing frameworks
- Transparent financial modelling
- Trust structures backed by governance and data

That's where actuaries come in—not as back-office risk technicians, but as architects of systems that must last.

As insurers, reinsurers, fintech builders, and policymakers explore this space, actuaries must not wait to be invited. We must step in early, shaping not only how value is transferred—but how it is trusted, protected, and grown.



Conclusion: Stablecoins Are a Tool—Actuaries Make Them a System

Stablecoins are not a silver bullet. But they represent a rare alignment of speed, accessibility, and programmability that maps closely to the needs of African economies.

As insurers, reinsurers, fintech builders, and policymakers explore this space, actuaries must not wait to be invited. We must step in early, shaping not only how value is transferred—but how it is trusted, protected, and grown.

Stablecoins may be the beginning. But the systems we build around them—grounded in actuarial thinking—may be our profession's next great contribution.

DECODING CREDIT QUALITY STEPS -

- An ode to Fermat's Last Theorem

by Edmond Vigoureux



Edmond Vigoureux,
FASSA

Somewhere in the 15th century, a French mathematician, Pierre de Fermat, wrote in the margins of his copy of the mathematical manuscript, Diophantus' Arithmetica:

"It is impossible to separate a cube into two cubes, or a fourth power into two fourth powers, or in general, any power higher than the second into two like powers. I have discovered a truly marvellous proof of this, which this margin is too narrow to contain."



In this, Fermat conjectured that he had found a proof to show that no three positive integers a, b, and c can satisfy the equation

$$a^n+b^n=c^n$$

,for any integer value of n > 2.

This is known in mathematics as "Fermat's Last Theorem," for which he never provided the proof. The conjecture remained unproven for over 300 years and was only recently confirmed as correct by Andrew Wiles in 1994. Many mathematicians attempted to prove this conjecture over the 300 years that followed, as well as many centuries before Fermat's margin entry, without success. It took Andrew Wiles ten years to prove it, using a branch of mathematics that was not available to Fermat at the time.

It remains uncertain whether Fermat truly had a proof or merely believed he did. Notably, Fermat often wrote quirky anecdotes and similar conjectures in the margins of manuscripts. Before 1994, solutions could be found for all other such problems Fermat claimed to have solved – making this his last unsolved conjecture and giving the theorem its name.

While contemplating the frustration that other mathematicians, who came after Fermat, must have experienced in trying to find the solution, it occurred to me that I have faced similar challenges in my career on various actuarial matters. One of these is certainly the question of how to map external credit ratings to the eighteen Credit Quality Steps (CQS) notches in the Prudential Standards…

It is important to recognise at this stage that the CQS assigned to exposures influences various elements of regulatory reporting, not only the Solvency Capital Requirement (SCR) but also the Basic Own Funds (BoF) position:

- The Spread, Default, and Concentration Risk modules are all directly affected by the level of CQS mapped to counterparty exposures.
- The impairment of risk-mitigating instruments, which adjusts the capital charges, as calculated in various sub-modules of both Non-life and Life Underwriting Risk, is determined based on the CQS assigned to the risk-mitigating counterparties.
- The default adjustment on reinsurance and other risk transfer arrangements included on the regulatory balance sheet is set in line with the CQS assigned to these counterparties.

Moreover, assigning the wrong CQS notch can cause a substantial misstatement of the individual results. For this example, consider a corporate fixed-coupon bond with a five-year outstanding duration. The table below details the Spread Risk capital charge, expressed as a percentage of the bond's value, per CQS (based on the instrument rating rather than the entity rating). It also demonstrates the relative impact (understatement) on the capital charge if the CQS is understated by one notch and two notches, respectively.

		Relative change (understatement) to the original capital charge	
CQS	Capital Charge as % of Market Value	One Notch Out	Two Notches Out
1	0.65%	N/A	N/A
2	0.98%	151%	N/A
3	1.24%	127%	191%
4	1.88%	152%	192%
5	2.40%	128%	194%
6	2.70%	113%	144%
7	3.35%	124%	140%
8	4.01%	120%	149%
9	5.43%	135%	162%
10	6.37%	117%	159%
11	7.62%	120%	140%
12	9.36%	123%	147%
13	11.26%	120%	148%
14	14.35%	127%	153%
15	17.26%	120%	153%
16	22.82%	132%	159%
17	23.80%	104%	138%
18	24.19%	102%	106%

For example, if you assigned the bond a CQS of 12, but a more accurate reflection should have been 13 (a single notch), the correct Spread Risk capital charge would be about 20% higher than what you are currently holding. Similarly, if the more accurate reflection of the CQS on this bond should be 14, this would result in a 53% higher capital charge.

When considering the importance of correctly assigning the CQS to exposures and how central the concept of CQS is to the prudential solvency regime, one might assume there is ample guidance in the Prudential Standards on mapping CQS to external ratings. Alas, the assumption seems to be our own – failed – conjecture...

The following is the only relevant guidance in the Prudential Standards, not many more words than in Fermat's margin entry:

> *Where an insurer relies on external ratings to assign an instrument to the appropriate credit quality step and there is more than one external rating available, the historic default rates associated with each rating category must be assessed in order to assign the instrument to the most appropriate credit quality step. The credit quality step that is assigned should reflect the credit quality of the instrument and not the entity issuing the instrument. (FSI4.1, Section 9.10)*



It is interesting to observe that the EIOPA (European Insurance and Occupational Pensions Authority) offers mappings of Solvency II's six-notch CQS system to the credit rating scales of various credit rating agencies. Unfortunately, compared to the Solvency II regime, our eighteen-notch CQS system is too granular for these mappings to be of much help in our SAM context.

This is where Fermat's story and ours diverge. The CQS Working Group of the SAM Phase II Sub-committee recognised that there had to be a solution to the issue and embarked on a research journey that lasted less than 300 years to find it. The Working Group had the following objectives in mind:

1. To provide a suitable methodology or approach to map the eighteen SAM CQS notches to external credit ratings.
2. To apply the above methodology and provide a mapping of the CQS to the long-term credit ratings of Fitch, S&P and Moody's.

The resulting research paper is not titled a "last" theorem, but it is worth a read. The research paper titled **"CQS mapping to long-term external credit ratings" is available here: https://www.actuarialsociety.org.za/download/CQS%20mapping%20to%20long-term%20external%20credit%20ratings/?wpdmdl=27945**.

Please refer to it for detailed information on the proposed methodology, along with the mechanics and justifications related to the mappings. The proposed mappings of these credit rating agencies are also presented in the research paper.

I want to thank the following individuals who played an instrumental part in performing this research:

- Daniel Ponto
- Jacques Bagraim
- Kumaran Reddy
- The CQS working group
- Members of SAM Phase II Sub-Committee
- Various other industry members

In conclusion, the challenge of accurately mapping external credit ratings to the eighteen CQS is like the puzzle of Fermat's Last Theorem, which has fascinated mathematicians for centuries. Developing a reliable methodology demands creativity, determination, and collaboration. As we strive to enhance our understanding and application of the CQS framework, we adopt the same spirit of inquiry that motivated Fermat. This is precisely the kind of engaging and exciting work the SAM Phase II Sub-committee undertakes.

THE BANKING ACTUARY:

A Profession Evolving

by Thapelo Sekanka



In recent years, the role of the actuary has begun to take root in the banking world in a way that would have seemed niche just a decade ago. What was once a profession traditionally linked to insurance and pensions is now increasingly finding relevance in the domains of credit risk, asset-liability management (ALM), regulatory capital, and strategic decision-making. Welcome to the era of the banking actuary.



From ECL to ALM: Expanding the actuarial brand

Actuaries in banking have already proven their value in the IFRS 9 space, where Expected Credit Loss (ECL) modelling closely mirrors traditional actuarial work in reserving and projections. But the value does not stop there. Banking actuaries are increasingly stepping into areas like ALM, liquidity risk, pricing strategy, and even product development. This shift marks a broader evolution from technical modellers to strategic advisors who blend quantitative rigour with business insight.

A seat at the table: The rise of the banking actuary

Banks across the globe are starting to recognise the distinct value actuaries bring, particularly those trained in balancing uncertainty, regulatory compliance, and long-term financial planning. As a result, we are seeing a marked increase in banks hiring actuarial graduates and students into risk modelling, finance, treasury, and credit departments. However, these roles are often shared with professionals from other quantitative backgrounds - mathematicians, engineers, statisticians, and economists - leading to a mixed professional culture that presents both opportunity and ambiguity.

A different path, a different treatment?

One interesting dynamic in banks hiring actuarial talent is the different treatment often afforded to actuarial students. Many are provided with benefits more common in traditional actuarial employers, such as study leave, exam support, and mentorship, while their non-actuarial peers in the same teams may not receive the same perks. This has the potential to create tension or a sense of imbalance in teams, especially when roles and deliverables are largely similar. It also underscores the need for banks to be intentional about how they integrate and support actuarial development within their broader talent strategies.

Traditional vs. Banking actuaries

The traditional actuary in insurance often works within a well-established ecosystem, with defined professional pathways and a clear alignment between qualification milestones and job progression. In contrast, the banking actuary operates in a more fluid environment. There is no formal requirement for actuarial credentials in most banking roles, and professional recognition of actuaries in banking is still developing. However, this fluidity allows banking actuaries to shape their own paths, often taking on cross-functional roles that include analytics, regulation, and strategic planning.

Skills for the modern banking actuary

Technical ability is no longer enough. Today's banking actuary must also be fluent in tools like SAS, Python, SQL, Power BI, and cloud-based platforms. Just as crucial is the ability to communicate with senior stakeholders, simplify complex models for business use, and influence across departments. Governance, control frameworks, and audit readiness are now part of the essential skillset. This upskilling journey is not just about acquiring tools - it's about broadening horizons. Banking actuaries are expected to engage more holistically with business outcomes and to step into leadership conversations, bringing their unique perspective to the table.

Are banking actuaries the next Chief Risk Officers?

The potential is undeniable. As financial institutions grapple with a growing array of complex risks ranging from climate change and cyber threats to shifting regulatory landscapes and AI disruption, the demand for leaders who can blend technical proficiency with strategic foresight has never been higher. Banking actuaries, with their deep understanding of long-term financial risk and their ability to model future uncertainty, are increasingly well-positioned to meet this need.

As the profession continues to evolve, it brings with it a distinctive mindset, one that is as comfortable with uncertainty as it is with data, and as attuned to people as it is to numbers.

A particularly valuable credential in this space is the Enterprise Risk Management (ERM) exam. It has become an attractive option for banking actuaries, offering a structured pathway to gaining the holistic risk knowledge expected of senior risk leaders. It aligns well with the competencies required of Chief Risk Officers and strengthens the actuarial toolkit in areas like capital management, operational risk, and governance.

Concluding thoughts

The banking actuary may still be a relatively new phenomenon, but it is one that is clearly here to stay. As the profession continues to evolve, it brings with it a distinctive mindset, one that is as comfortable with uncertainty as it is with data, and as attuned to people as it is to numbers. For actuaries willing to adapt, upskill, and lead, banking offers a vast and exciting frontier.

MARKET CONDUCT INSIGHTS:

Nuggets from the Annual Ombud Reports

by Nicky Patchett, Kudzai Mtebule and Sandthiren Mudaly



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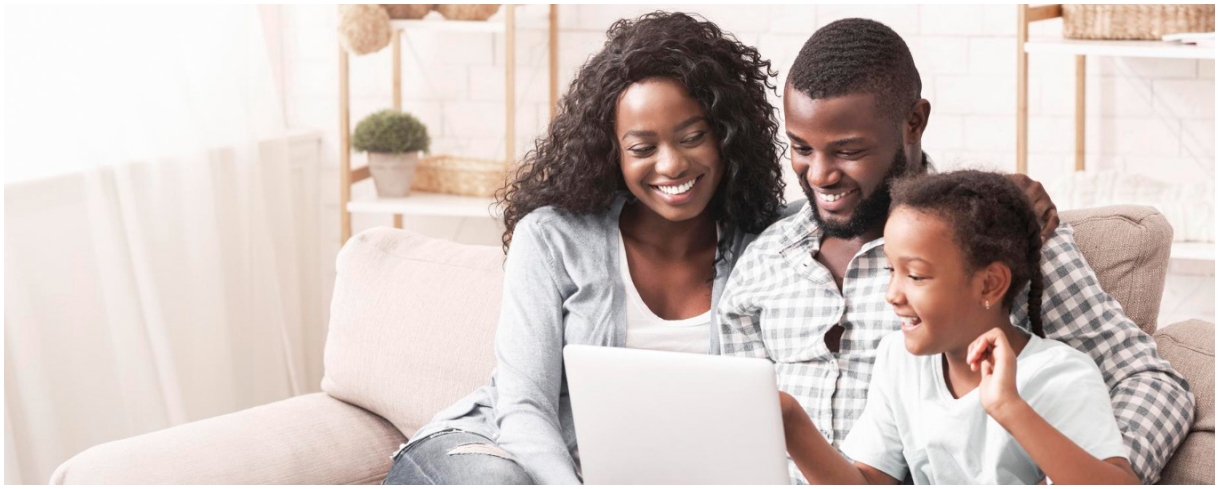
Sandthiren Mudaly
FASSA CERA

Nicky, Kudzai and San have a keen interest in market conduct matters and contributed this article as members of LAC's Market Conduct Subcommittee.

Treating customers fairly should be at the heart of life insurance. Insurance documentation should be clear enough for the customer to understand what they have bought and are covered for. A policy sold should meet the policyholder's needs. As the life insurance industry, it is important to consider our market conduct as well as whether we are practicing in line with regulations and our promise to customers.

The role actuaries play is very important, given our part in the design, pricing, and distribution of products, as well as our advisory role to businesses. The Policyholder Protection Rules aim to protect the customer, as did the previous Treating Customer Fairly rules. The Actuarial Society of South Africa (ASSA) also has various guidance notes that cover market conduct concerns.

Another key role player in market conduct matters is the National Financial Ombud Scheme ("the Ombud"), an independent body that resolves complaints brought by consumers against South African financial institutions.



The Ombuds' 2023 report, published every year, shows a general increase in the number of complaints received in relation to long-term insurance policies, with 30% resolved wholly or partially in favour of the client. In 2023, 50% of the complaints received were in respect of declined claims. The bulk of these complaints were for funeral business, as well as life benefits. The table below shows the nature of complaints.[1]

	LIFE				DISABILITY			
NATURE OF COMPLAINT	**2023**	**W/P***	**2022**	**W/P***	**2023**	**W/P***	**2022**	**W/P***
Poor communications/documents or information not supplied/poor service	446	29%	484	29%	56	39%	44	32%
Claims declined (policy terms or conditions not recognised or met)	382	11%	384	26%	265	28%	244	37%
Claims declined (non-disclosure)	80	14%	111	22%	12	8%	34	24%
Dissatisfaction with policy performance and maturity values	55	11%	64	8%	2	0%	0	0%
Dissatisfaction with surrender or paid-up values	43	9%	38	8%	0	0%	0	0%
Lapsing	116	33%	139	32%	1	0%	1	100%
Miscellaneous	106	18%	74	18%	4	50%	7	29%
Total	1 228	23.1%	1 294	25.4%	340	28.8%	330	34.8%

** Resolved wholly or partially in favour of the complainant.*

The annual report includes a number of case studies relating to specific complaints, with discussion of the underlying concerns and the Ombud's reasoning on their rulings. Many of these case studies cover pricing and design topics, both of which are of interest to actuaries. We believe that wider dissemination of the Ombud's report would improve members' understanding of market conduct issues and, in light hereof, this article considers a few cases that were reported to the Ombud and the potential learnings that actuaries can glean from them.

Case Study 1



In their 2022 report, the Ombud describes a case, Case Report 50 No Consensus; Premium Refund; Compensation for Poor Service, where the insurer declined a claim on the basis of the death not being from non-natural causes, which is what the policy covered.

On listening to the sales call, the Ombud found that:

- When asked during the telesales what cover he preferred, the insured responded "life cover".
- When the call centre agent mentioned "non-natural", it was in a rushed manner and often inaudible.
- The insured was never asked during the telesales process if he understood the terms of cover.
- The call agent's response to the numerous medical disclosures made by the insured during the call was "no problem", which suggested a lack of understanding and appreciation of the importance of those disclosures.

In addition to this, the call was conducted in English even though the insured was Afrikaans speaking. The Ombud found that there was no meeting of minds at the point of sale. Based on the health disclosures the insured made, the fact that the insurer pointed out that he needed life cover and that the word "non-natural" was not very audible on the call, the Ombud ruled against the insurer. They also determined that the word, "non-natural" was misleading. The Ombud determined that there had been poor service and the insurer had to refund all the premiums paid on the policy as well as R30 000 in compensation.

From this case, some of the market conduct learnings and questions that arise are:

- Are sales agents adequately trained and do they understand how to check if the products they are selling meet the customer's needs?
- Are the sales agents trained to attentively listen to what the client is saying and decide if the product on offer is suitable for the client?
- Is it fair to expect the client to fully know and understand the benefits being offered?
- The words used in policy wording should be clear and understandable to the target market, so as not to leave doubt on the benefits provided.

Case Study 2



In their 2022 report, the Ombud describes a case, Case Report 49 Interpretation of Exclusion Clause, where a claim was declined on the basis of a pre-existing condition. The Ombud ruled against the insurer and ordered that they reconsider the claim.

The insured died from COVID-19 before the policy was underwritten, and the repudiation was based on the following wording in the policy document.

"Where the Policy has not been underwritten, a claim will not be admitted if the claim arises directly or indirectly from a Pre-existing Condition, which is any condition that existed preceding or during the application for life cover, for which the Life Insured has:

a. consulted a medical practitioner or specialist, or

b. taken prescribed medicine, or

c. received treatment, surgery or advice, or

d. been on a waiting list for medical treatment, or

e. manifested symptoms which would have caused a reasonable person to seek advice, or

f. received a terminal prognosis, or

g. an on-going medical condition of which the Life Insured is or ought to be aware.

This includes, but is not limited to, the conditions listed in the Pre-existing Conditions Appendix, as well as COVID-19 related symptoms or illness."

Although there was no evidence that the insured had suffered any COVID-19 symptoms or illness prior to taking out the cover, the insurer's view was that pre-existing conditions are only covered once underwriting has taken place, as underwriting is considered to be part of the application process.

The insurer also submitted that the reason the additional clause had been inserted into the policy during the COVID-19 pandemic was to specifically exclude COVID-19 claims where the underwriting process had not been completed. The Ombud noted the intention of the clause but concluded that the wording only talked about pre-existing conditions. In this instance COVID-19 was not a pre-existing condition and therefore the claim should be paid.

Some of the market conduct lessons from the case are:

- When designing products, it is important to clearly consider the exact intention of each clause.
- When drafting policy terms and conditions, ensure that the interpretation of each of the terms and conditions is the same as the intention in the design.
- When drafting marketing material ensure that the material explains the exact intention and meaning behind clauses.
- Policy documents should be clear in explaining situations in which cover is not provided.
- It is important to consider what pre-existing means and when cover is considered to be provided.

Case Study 3



In their 2023 report, the Ombud describes a case, Case Report 57 Funeral Benefit; Insurable Interest; Interpretation, where a claim on a funeral policy was declined due to the deceased, covered as an extended family member, not being the insured's sister as was stated at policy inception. The insurer further argued that there was no insurable interest between the deceased and the policy owner.

The funeral policy defined extended family as:

"This refers to other family members nominated by the Policyholder to be covered under this Policy and in whom the Policyholder has insurable interest. This will include the Policyholder's additional



Spouse(s), married or adult Children, 2 (two) Parents, 2 (two) Parents-in-law and other relatives."

The Ombud needed to determine whether the deceased fell within the definition of "other relatives". The complainant (policy owner) submitted that the deceased fell within the definition of other relatives due to the policy owner being raised by the deceased's mother upon their mother passing away at a young age. This statement was further corroborated by an affidavit submitted by the deceased prior to their passing. Furthermore, during the insurer's verification process, it was determined that the clan name of the deceased's grandmother was the same as the complainant's great grandmother.

The insurer initially declined the claim as they felt the deceased did not fall within the definition of the "other relatives" despite growing up with the policyholder and having relatives with the same clan names. Furthermore, the insurer contended that the complainant shared no insurable interest with the deceased, as it had no proof of a dependency between the complainant and the deceased.

After several rounds of arbitration, the Ombud came to the final ruling that the insurer should honour the claim on grounds of case law, concerning no evidence being available to rule out a valid adoption under customary law, meaning that even though the complainant was not adopted under civil law, it was still possible to have been adopted under customary law. The Ombud also encouraged the insurer to embrace the concept of Ubuntu and not act against it in the absence of the policy requiring a biological relation to qualify as an "other relative".

Some of the key market conduct take aways from the case are:

- Insurers should pay attention to definitions of dependents and lives covered under the policy.
- Where a biological relationship is required, this should be stated in the policy to avoid ambiguity.
- Ensure a higher alignment with policyholder expectations by making it clear what is required to demonstrate insurable interest.
- Insurers should consider the values, customs and culture of the environment in which they operate.

Conclusion

Market conduct is an important issue and contributes to how the public perceives and relates to the insurance industry, and actuaries are important role players in this space. We recommend that actuaries familiarise themselves with the Ombud's publications, in particular the annual Ombud reports. An awareness of the issues raised in these reports, especially where insurers were ruled against, will help us to design, sell and manage products that not only meet customer needs, but are well understood by the policyholders they cover.

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THE RISE OF THE SYSTEMS ACTUARY:

Bringing systems thinking to actuarial modelling

By Pamela Hellig and Garrit Nieuwoudt



Head of Insight Life Solutions



Head of Actuarial Systems at Insight Life Solutions

Put an actuary in front of a cash flow model and they will, given time, figure out how to run it, update it, modify it and extract its results. That's because actuaries naturally tend to be problem solvers, regularly developing solutions from first principles.

The drawback to actuaries being excellent problem solvers is that, while they will almost always find a workable solution, it may not always be the best, most robust or most efficient solution for the problem at hand. Traditional actuarial training isn't designed to encompass robust systems thinking and being a proficient coder does not always translate into the ability to create and maintain actuarial systems and models. The systems, IT, and computer science landscape is an independent realm of thinking, with its own best practices, conventions and principles, which may not come intuitively to anyone not trained in the field.

Hence the advent of the *systems actuary*, a term that's been informally coined in the actuarial community to describe an actuary who, according to Google's Gemini AI tool, "focuses on the development, maintenance, and optimisation of actuarial models and systems, ensuring accuracy and reliability, while also providing technical support and collaborating with IT professionals to meet business needs."

This definition broadly captures what a systems actuary does, but not what differentiates an actuary with bona fide systems training from one who has learnt what they know about systems by being thrown in the deep end and figuring it out on the job.

Why do we need systems actuaries more than ever?

We've seen a pronounced trend of life insurers starting to reassess their actuarial systems landscapes and explore the possibilities of modernisation, specifically in the realm of cash flow modelling engines. In our industry-wide survey conducted in Q3 last year, more than 80% of participants said they were contemplating a change in their actuarial software landscape within the next five years1. In this environment, understanding the skills and value a systems actuary can bring becomes increasingly important.

It is no coincidence that such introspection has come at the tail-end of vast IFRS 17 implementation programmes, which laid bare the inefficiencies and inflexibility that have been baked into antiquated legacy systems. Combine this realisation with the budget cuts that seem to be sweeping through the industry and a growing awareness of the potentially more suitable software options in the market, and you have a recipe for an actuarial systems revolution.

It may, however, be a revolution of the slow and steady kind – embarking on a systems migration or modernisation programme has the potential to be a huge undertaking. Initial steps may include preparing a business case, conducting vendor trials, and managing an RFP process… that's all before you start the implementation itself. But for those actuarial teams who have started contemplating the possibility of reassessing their cash flow modelling systems – a major step in itself – a systems actuary's input will be invaluable.

To give such teams a kickstart, in this article, we explore why rigour and discipline around actuarial systems and models are important and describe some properties of a good actuarial system as identified by our computer science-trained systems actuaries. We also list, from a systems actuary's point of view, some desirable features of modern actuarial projection software that might be considered when evaluating providers.

Why are discipline and rigour in building and maintaining actuarial systems important?

Imperfect actuarial systems do not always announce themselves as $6 billion London Whales. They manifest as staff working overtime due to models crashing, late submission of results because of long run times and audit findings when teams are not able to reproduce or explain modelled metrics.

The implementation of IFRS 17 brought systems issues – such as inadequate data storage, clunky data flow and an inability to integrate into other systems and business units – to the forefront of many actuaries' minds. Many of the flaws in the actuarial systems could have originated from a lack of IT expertise at inception and the developments bolted on along the way.

Well-designed actuarial systems save costs in the long run by being more efficient, automated and robust. A standardised approach makes the systems easier for new staff to understand and reduces key-person dependencies. Reputational, model and compliance risks are also reduced as models are more clearly defined and run better and more predictably, with fewer errors and crashes.

To achieve such a well-designed system, it is essential that actuaries receive IT or computer science training or that they outsource systems work to actuaries formally trained in systems.

For any actuary interested in formalising their IT knowledge, researching, internalising and applying some aspects of rigorous systems thinking and systems actuary expertise may provide a good starting point. In the sections below, we list features that make actuarial systems in general – and cash flow modelling systems in particular – desirable.

What makes a good actuarial system in general?

End-to-end flow of data and results:
Ensures that actuarial calculations are traceable from raw data to final outputs, reducing errors and improving transparency in decision-making. Robust automated logging is of great use here.

End-user experience:
Affects how actuaries interact with models and tools, ensuring usability, accuracy, and efficiency in deriving insights from complex data.

Version control and auditability:
Essential for tracking changes in actuarial models, preventing unintended modifications, and enabling rollback to previous versions if needed, e.g. during audits. This helps ensure compliance with governance standards and mitigation of risks from unauthorised modifications. Version control in actuarial modelling should arguably have a dedicated team/ resource.

Backwards compatibility:
Ensures that legacy actuarial models and historical data remain functional and usable when systems are updated, avoiding disruptions.

Modularity: Facilitates the development of reusable model and system components, allowing for flexibility and scalability in system enhancements, as well as quick development turnaround times for new features and products.

Extensibility: Allows actuarial systems to adapt to future regulatory changes and business needs without requiring a complete system overhaul.

Performance and Efficiency: Critical for efficiently handling large datasets and complex calculations, ensuring timely reporting and decision-making.

Time complexity:
Influences the feasibility of running actuarial models in real-time, affecting responsiveness and computational resource

allocation. Computer science knowledge of time complexity of algorithms and how to assess them is crucial in making implementation decisions in more complex non-linear actuarial models.

Data and storage management:
Ensures actuarial systems maintain high data quality, integrity, and accessibility for accurate modelling and reporting, as well as a robust and efficient storage setup. Knowledge of relational databases and normalisation will help the actuary decide on how best to set up valuation data, assumptions, and results databases.

Audit logging and traceability:
Provides a clear record of changes and decisions in actuarial processes, essential for compliance and risk management.

Interaction with existing systems:
Ensures smooth integration with finance, risk, and underwriting platforms, reducing inefficiencies and data silos. Acknowledging that the software landscape is constantly evolving in response to changing reporting and business requirements, building systems that plug into other software applications easily and aren't platform-locked, is of great value.

Appropriate selection of new tools and software:
Being aware of the latest trends and releases in the actuarial systems market allows the systems actuary to select the best solutions for their teams.

Optimisation of existing tools and software:
Enhances actuarial productivity by leveraging the team's existing software toolkit, reducing unnecessary expenditure on new systems and software. The actuary should know some simple techniques for identifying bottlenecks in the system.

Fit for purpose:
Ensures that actuarial tools align with business and regulatory requirements, preventing inefficiencies and inaccuracies. The size and complexity of the implementation and tool should be appropriate for the particular business case.

Efficient coding/uses IT convention for system design:
Supports maintainability, scalability, and collaboration between actuaries and IT teams, reducing technical debt. Learning things like Boolean algebra, Backus-Naur Form, REST API use, git, and how to work with an Integrated Development Environment (IDE) will be of great value here.

Collaboration with IT:
Working closely with IT professionals to develop and integrate actuarial systems helps ensure that they meet business requirements and regulatory standards. Systems actuaries are able to speak "IT", which allows them to draft IT requirement specs in the correct language for BI and IT teams, acting as a communication bridge between Actuarial and IT.

What makes a cash flow modelling system desirable?

Interoperability:
Enables seamless integration with existing systems and tools, allowing actuaries to build custom workflows without being locked into a single platform.

Modularity:
Encourages reuse and maintainability by letting users swap or upgrade individual components without affecting the entire system. It also reduces scope for code errors and turnaround time for new product and feature implementation.

Orchestration functionality:
Allows the coordination of complex tasks across multiple modules or systems, ensuring the efficient execution of multi-step reporting processes.

Fair pricing:
Offers cost-effective licensing and makes systems accessible for teams of various

sizes without sacrificing functionality.

Auditability:
Refers to maintaining transparent records of changes, inputs, and assumptions, which supports compliance and simplifies external or internal audits.

Familiar coding language (e.g. Python, VBA):
Lowers the learning curve, increases adoption by allowing actuaries to work in languages they already know, and makes recruitment of systems actuaries and actuarial modellers easier.

Use of modern coding frameworks (e.g. loops, classes, logic flow): Enhances code readability, reusability, and efficiency, leading to faster development and easier maintenance.

Detailed help file:
Reduces onboarding time and supports troubleshooting with thorough, easy-to-navigate documentation.

Input and output in any format (ODBC): Increases flexibility by allowing direct connectivity to various data sources and formats, facilitating smooth data exchange.

Text-based code files for better version control (using tools like Git):
Enables robust version control, collaboration, and rollback capability through integration with standard development tools.

Built-in access control and change logging:
Enhances security and governance by tracking user actions and restricting access based on roles.

Parallel processing and high-performance computing:
Makes use of multiple CPU cores, different computers, or scalable cloud computing environments such that run times scale with increased computing power.

Debugging and Visual Analysis:
Allows the setting of a breakpoint in a model code and then step through.



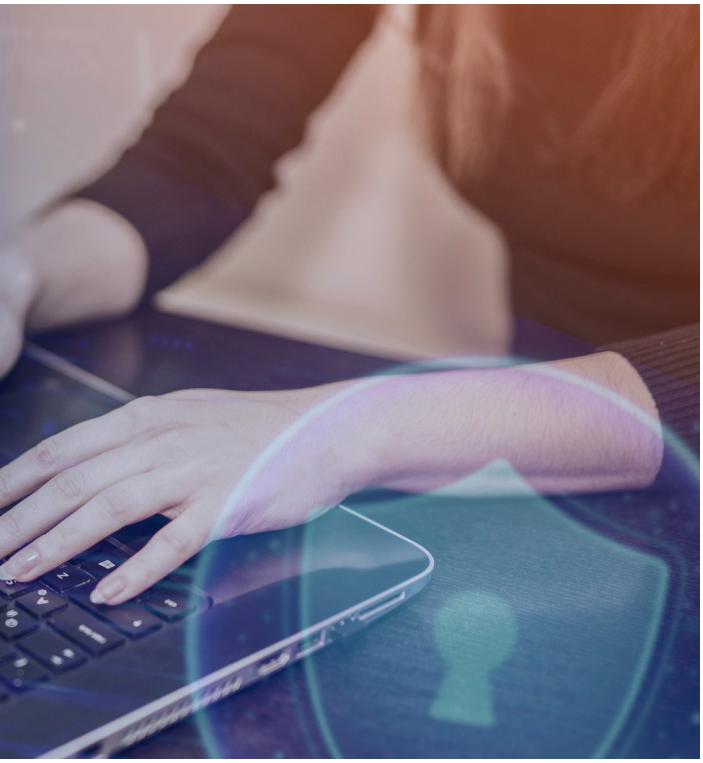
It is often the experience and expertise found in the intersection of the "actuaries" and "IT" Venn diagram that is needed to lead and implement such decisions...and that space is exactly where the systems actuary may be found.

How do we know which system is right for us?

The features listed above provide a general guide to what makes a projection system desirable, but they may not all be necessary or suitable for every insurer. When assisting clients in assessing software options, we tend to evaluate them based on the following categories:

1. Learning Curve

- Taking on a newer, cutting-edge solution means there is less availability of adequately skilled resources in the market. For some platforms, the



learning curve is so flat that this isn't a problem, and self-teaching is possible. In other cases, the lack of expertise in the market can render the platform non-viable.

2. Features vs. Price

- How much do you get as a standard, what would need to be paid for separately, and how much do the extras cost? The decision around which system to go for will depend heavily on whether the features that are important to one's business are included in the standard package or are at least affordable extras.

3. Ease of Implementation

- As in programming languages, there is generally a trade-off when it comes to the power vs. speed of implementation for actuarial projection systems. A higher-level language allows for fast implementation turnaround, but it may not run as efficiently or be as robust. Similarly, with actuarial software, a smaller company with a single book of business may choose a lightweight, easy-to-manage solution over one that is more complex and robust. The latter would be more appropriate for a company managing a large suite of businesses and products.

4. Integration

- This pertains to the need for existing systems to interact with the new software, and how well the new software allows for it. Companies looking to revamp their systems entirely will be more willing to accept a solution that locks them into a particular platform versus those that use an array of software that runs before, next to, or after the projection system. The latter type of company should favour software that plays nicely with others.

So, how does one balance the above criteria and choose the best cash flow modelling system? Like so many things in life (insurance), it depends on the insurer's specifics and the objectives of the modernisation exercise. It is often the experience and expertise found in the intersection of the "actuaries" and "IT" Venn diagram that is needed to lead and implement such decisions…and that space is exactly where the systems actuary may be found.

This article was adapted from blog posts on the Insight website. For even more detail and insights on the features listed above, please see the original posts:

The Rise of the Systems Actuary: *Bringing Systems Thinking to Actuarial Modelling*

Modernising Actuarial Systems: *What to Look for in Cash Flow Modelling Software*

SECURING THE FUTURE -

Cybersecurity Strategies for the Insurance Industry

by Paballo Makupu



FASSA (Discovery, STIC Communications Sub-Committee Head)

In today's digital era, cyber threats have become a major concern for insurers, making robust cybersecurity measures an essential business priority.

If the average office worker receives around 121 emails every workday and sends out an average of 40 emails per day (Templafy, 2020), the total number of emails exchanged within an organisation can be staggering. For a company with 100 employees, that equates to 4,000 business emails sent daily - a shocking statistic considering the rapid digital transformation of South Africa's insurance industry.

While digitalisation enhances efficiency and innovation, it also exposes insurers to significant cyber risks. Insurers hold vast amounts of personal and financial data, that is highly valuable to cybercriminals. Robust cybersecurity is no longer optional - it is a business necessity. Compliance with regulations such as the Protection of Personal Information Act (POPIA) adds another layer of responsibility. However, insurers are not only protecting themselves - they are also stepping up to help businesses manage cyber risks through tailored insurance solutions.

The Rising Threat: *Cyber-crime Trends in South Africa*

Cybercrime, including phishing, ransomware, and online fraud, saw a substantial increase in 2023. Reports from cybersecurity firms and the South African Cyber Security Hub highlighted a growing number of attacks targeting individuals, businesses, and government entities. The digital banking sector experienced an unprecedented 45% increase in fraud, leading to a 47% surge in financial losses. Banking app fraud accounted for 60% of all digital banking crimes, marking an alarming 89% year-over-year increase (SABRIC, 2023).

Despite ongoing security enhancements, cybercriminals are continuously evolving

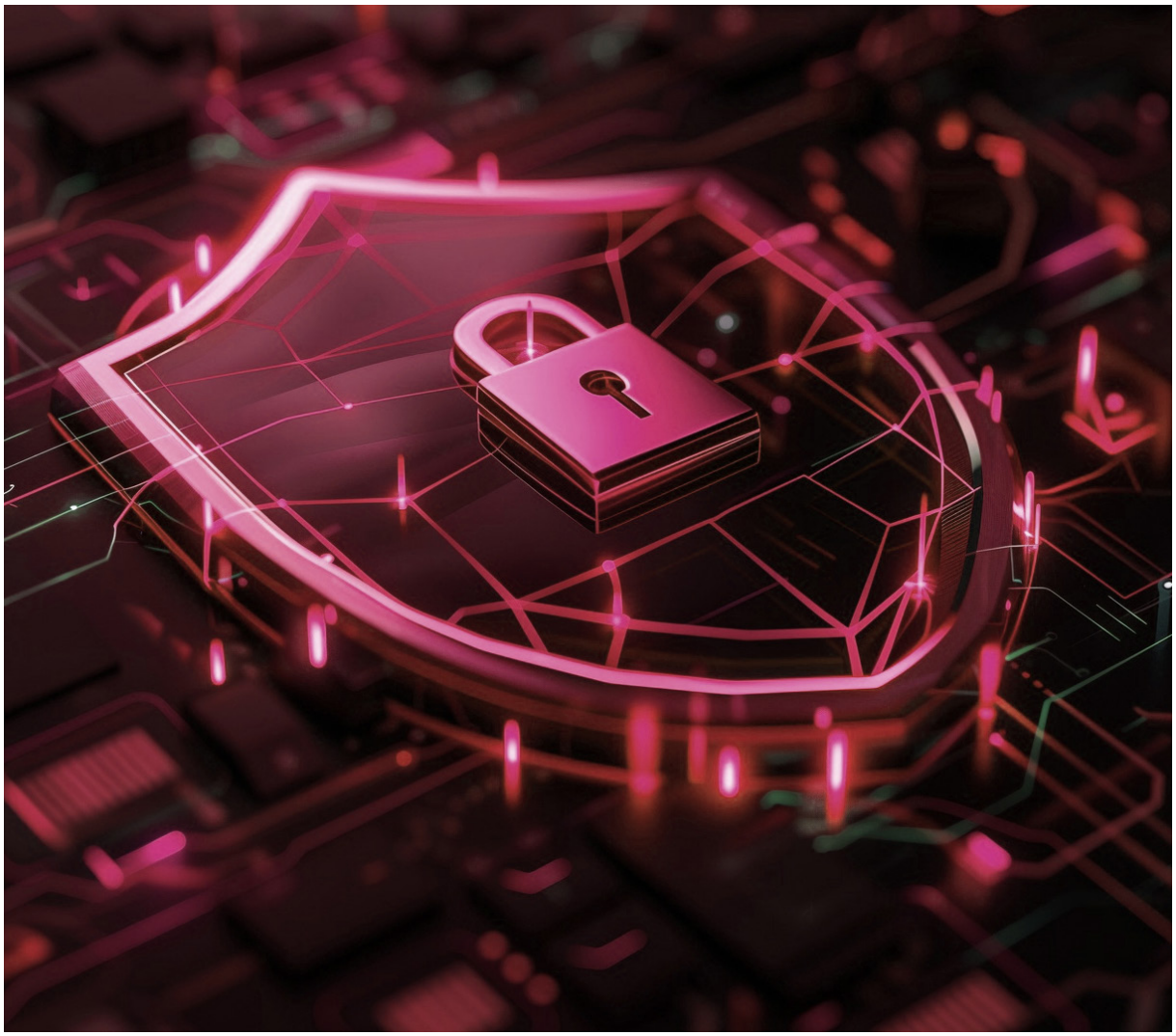


their tactics. A particularly concerning trend is the rise of generative AI in fraudulent activities, demonstrating cybercriminals' adaptability.

What strategies can be implemented to secure the future and shift the dial on cyber risk mitigation?

Awareness and Education

The rise of AI-driven cyber threats, such as deepfake fraud, AI-powered phishing, and automated hacking, necessitates stronger AI-based defence mechanisms. However, technology alone is insufficient. Human error remains a significant vulnerability in cyber defence, making security awareness and training critical. Many organisations have already taken active steps to enhance resilience through cyber awareness programs to prevent phishing and social engineering attacks, simulated cyber-attack drills to test response effectiveness as well as strengthening internal cybersecurity cultures to mitigate risks.





Regulation and Investment

A shift from reactive responses to proactive cybersecurity investments is necessary. Currently, many businesses only address cyber threats after an attack rather than focusing on prevention. Alarmingly, 90% of cyber incidents in South Africa go unreported (The Citizen, 2023), highlighting the urgent need for stronger cybersecurity strategies.

South Africa's regulatory framework, including the Cyber Crimes Act and POPIA Act, aims to strengthen cyber protections. However, enforcement gaps pose significant challenges for decision-makers. Despite widespread awareness of cyber risks, 87% of global business leaders admit their organisations are still underprepared (Munich Re, 2024). This underscores the need for increased investment in cybersecurity infrastructure and expertise.

Managing Exposure

To combat evolving cyber threats, insurers must adopt robust security measures, including employee training and cybersecurity awareness programs;

A well-structured contingency and business interruption plan is crucial to minimising financial and operational losses.

multi-factor authentication (MFA) and biometric verification as well as regular software updates and system patches.

However, addressing silent cyber, cyber risks embedded in traditional policies without explicit coverage, remains a challenge. Insurers must work towards defining cyber risks clearly within policy wordings, improving risk modelling, and developing standalone cyber insurance policies to mitigate unintended exposures. With the cyber insurance market growing at an annual rate of 32% from 2017 to 2022 (Swiss Re, 2024), a structured approach to cyber risk management is imperative.

Contingency Planning and Business Interruption Readiness

The patience and sophistication of modern cybercriminals present significant risks. Like cancer, cyber threats often go undetected until severe damage has already occurred. A well-structured contingency and business interruption plan is crucial to minimising financial and operational losses.

The 2021 ransomware attack on Transnet, which disrupted South African ports and had widespread economic repercussions, serves as a stark reminder of cyber vulnerabilities. While Transnet is not an insurer, the lesson applies universally: insurers must fortify their defences before they become the next headline. Effective cyber resilience includes incident response planning, cyber insurance solutions to cover financial losses as well as advisory services and platforms to facilitate rapid recovery.

Final Thoughts: *The Future of Cybersecurity is Now*

Cyber threats will continue evolving, and insurers must adopt agile, forward-thinking strategies. By leveraging actuarial expertise, advanced cybersecurity frameworks, and collaborations with industry experts, insurers can transform digital threats into opportunities for innovation and market growth.

The time to act is now. A cyber-resilient future depends on strategic investment, regulatory alignment, and industry-wide collaboration. Let's work together to build a more secure digital landscape.

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Human Wildlife Conflict (HWC) Insurance in times of drought.

CALL TO PROTECTING WILDLIFE AND LIVELIHOODS **PART 2** -

by Syed Danish Ali



We cover how Human Wildlife Conflict (HWC) insurance can help in setting a foundation to reducing challenges brought about by climate change and to increase risk resilience of vulnerable communities. This is part 2 of the previous *SA Actuary* article where we cover further key product development, tech, operational and actuarial considerations. We also cover how insurers can help nudge communities towards implementing preventive risk mitigation measures to reduce HWC conflict in the first place.



Our role as actuaries and insurance professionals is to ensure that human-wildlife interactions evolve into a sustainable balance, where communities are empowered, ecosystems are protected, and every life, human or animal, has the space to flourish. By harnessing data-driven insights and innovative risk solutions, we can help turn the tide from conflict to co-existence, nurturing a world where prosperity and biodiversity walk hand in hand.

1. Key operational and actuarial considerations

Tech is only a tool, and without the right operational setting, it can fail to achieve its objective. Actuaries can act as insurance domain and quantitative experts to aid social policy makers in making national pools, insurance schemes, and operational strategies around HWC and agricultural insurance. They can provide cost-benefit analysis to wider areas of finance such as catastrophe bonds and social impact bonds for HWC as well.

Few examples of possible operational suggestions that actuaries can make to stakeholders spanning insurers, government, and international organizations over HWC are:

- Reinsurers usually avoid complex highly exposed coverages like HWC. Even if reinsurance coverage is available, the rates can be too high, coverage too low, and there are problems with USD indexing payments and sending remittances abroad due to foreign currency controls. We can compensate for this lack of reinsurance by focusing more on domestic coinsurance pools and consortiums.
- Government involvement is important to allow mass adoption in HWC and crop insurance. Public private partnerships (PPPs) can work on the strength of both the sectors to achieve winning outcomes.
- Government should specify a minimum and maximum tariff price on premiums instead of giving a fixed price for all HWC and agricultural



insurance programs. Within that spectrum, the insurer can vary its premium. This can allow scientific risk-based pricing by segments to be implemented to remove market distortions. For example, due to micro-climates, one region may have lower risk, so should pay a lower premium than another region, even though from a policy basis, the preference may be for one uniform rate. An area with higher rain may mean generally richer farmers than another area of lower rainfall that may mean poorer farmers. If both pay the same price, despite the poorer region having lower risk, that premium would arguably be inequitable because the poorer farmers will be cross-subsidising richer farmers.

- It looks on the surface that having experience refund (no-claim refund) is desirable for HWC and crop insurance since this can allow high premiums to be set by the private sector for coverage, and any unspent premium at end of the year can be given back to the government. This seems to solve the dual problem of private sector complaining that government asks for too low premiums and government's constraint of low budgets. However, for HWC and agricultural insurance, this can be counter productive since this is not motor or medical insurance with high frequency and low severity claims. Claims for HWC and agricultural insurance tend to be low frequency and high severity. Insurers can expect to be hit by huge catastrophic claims 1-in-10 years. If

they are not allowed to build buffers in the good years, there will be no incentive to cover losses during those catastrophic years like droughts in eastern and southern Africa in 2023 and 2024. Experience refunds should, therefore, not be annual, but be evaluated by stakeholders for the long term like being based on 10 years' performance.

- Stand alone insurance is not tangible and suffers from trust issues. So, we must combine HWC and agriculture insurance with inputs like seeds, fertilizers and community programs to make insurance more tangible and to expedite its scalability.
- In implementing IFRS 17 for inclusive insurance, actuaries can determine the Loss Component (LC). The LC quantifies the shortfall between expected premiums and fulfillment cash flows for onerous contracts, making it a powerful tool for identifying where premium subsidies by government or donor partners are needed in existing inclusive insurance products. For newly launched or yet-to-be-launched products, actuaries can apply the same methodology prospectively to simulate future LC values based on expected pricing and claims assumptions. This forward-looking use of LC helps quantify the precise amount or proportion of premium subsidy required from government partners, enabling data-driven decisions about subsidy design and budget allocations to ensure product viability and sustainability.
- The broader and most crucial impact from having actuaries is the data driven decision making skill and approach that they bring to the table. They help capture data, set hygiene level for data, as well as compensate for inadequate actual data by fitting distributions and carrying out simulations to create simulated data and worst-case risk metrics. Risk driven pricing and reserving is not politically popular, but crucial to long term sustainability and solvency.

The broader and most crucial impact from having actuaries is the data driven decision making skill and approach that they bring to the table.

2. Nudging towards Preventive and Risk Mitigation Measures via insurance

The HWC insurance can act not just as a partner in bad times, but also as a partner in good times by focusing on raising awareness and encouraging preventive mitigation measures by the communities to reduce HWC conflict in the first place. There can be a fixed budget and merit rebates from premiums for improving infrastructure of farmers and awareness camps covering various mitigation measures such as for[1]:

- Acquiring and installing mobile and permanent predator-proof Bomas livestock enclosures that keep animals safe at night when most predation occurs.
  - *Having safe enclosures is the most important part practically because of 'surplus killing'. We know that wolves attack multiple livestock because they hunt in packs, but even solitary predators like leopards and tigers can kill dozens of livestock in a single event due to surplus killing.*
  - *Surplus killing, seen in snow leopards and other predators, occurs when easy access to trapped prey (like livestock in*

pens) triggers repeated hunting instincts, not out of malice but due to the unnatural setting.

- *In the wild, predators expend effort for each kill and rarely encounter such vulnerable situations. Confined, panicked prey continuously activate the predator's evolved response to chase and attack, even if the kills aren't eaten.*
- *This rare but destructive behaviour is unintentionally caused by human livestock enclosures, leading to major livestock losses and retaliatory killings of endangered predators. Conservation efforts now emphasise predator-proof corrals to protect both wildlife and local communities.*
- *There have been documented cases where snow leopards have killed dozens of livestock in one night. In a remote valley of Gilgit, Pakistan, a snow leopard killed 68 domestic goats in six separate incidents during a single night.*
- *Similarly, in Nepal's Phu Valley, a snow leopard was reported to have killed 44 goats in one night after entering a corral*[2].





- Providing 'Predator Deterrent Lights' to communities living in conflict hotspots. These are a series of solar-powered LED lights installed around the bomas that flash alternately to deter predators. In addition, the solar panel powering 'Predator Deterrent Lights' supply lighting to communities whose homes are not connected to the grid
- Providing solar-powered boreholes and water pans in community conservancies, which provides water for people, their livestock and wildlife, thus minimising human-wildlife conflict fueled by water scarcity.
- Designed programs targeting the prevention of conflict by threatened flagship species, like the African elephant and lion. Preventing conflict by these flagship species gives us an opportunity to prevent conflict by other species, directly or indirectly.
- Focusing on drought resistant crops and moisture farming and drip irrigation to conserve water. It's not only Luke Skywalker from Star Wars who needs to do moisture farming! For example, Africa's drought tolerant Moringa and Cassava, makes a high protein, nutritious, tasty, gluten free, inexpensive substitute for Ukrainian wheat flour.
- By incorporating practices such as crop rotation, agroforestry, cover cropping, and minimal tillage, regenerative farming helps create a diverse habitat that attracts wildlife away from main crops. This reduces the pressure on wildlife to invade farms, as they find





sufficient food and shelter within integrated, wildlife-friendly areas. Additionally, regenerative farming helps improve soil moisture, making farms less vulnerable to drought, and reducing the competition between humans and wildlife for scarce water resources.

- Using organic fertilizers can significantly reduce the need for chemical pesticides, which is beneficial in mitigating HWC. When farmers adopt organic methods, they create a healthier ecosystem that attracts beneficial insects and wildlife rather than harmful pests. This approach reduces reliance on harmful chemicals that can lead to wildlife poisoning or habitat degradation. By promoting biodiversity and healthier soils, organic farming practices can help foster coexistence between agriculture and wildlife, ultimately decreasing conflict over resources.
- Growing chillis (as they irritate elephants) or weeds around edge of fields (kept there deliberately so that wildlife forages those instead of economically important crops) are other simple measures from learned experience of communities. Honey bees can be farmed and be placed around the edges of farms as they also irritate elephants and discourage them from entering farms. The bees can also provide honey to humans, so it's like achieving two objectives with one action.

3. Everything is connected

HWC isn't just about economic losses - it often results in injuries or psychological trauma. Microinsurance products can extend coverage to include medical treatment for injuries and death caused by wildlife to humans and provide access to mental health support for communities regularly facing dangerous encounters, addressing a critical but often overlooked aspect of HWC insurance.

Since everything is connected, it's important to immerse ourselves to realise these inter-connections on the ground. Dr. Ali Nawaz in Pakistan found out that livestock deaths from diseases were 5-10 times higher than livestock death

> He provided livestock vaccination and veterinary services in remote valleys and after 3 years, livestock deaths from diseases had decreased by 80%-100% in these areas.







from snow leopard or wolf attack. He provided livestock vaccination and veterinary services in remote valleys and after 3 years, livestock deaths from diseases had decreased by 80%-100% in these areas. For Nawaz, this impact was huge. His proposed agreement with the communities was working - in exchange for helping save five animals from diseases, the communities were willing to tolerate one loss caused by the snow leopard[3].

We can have both positive and negative impacts on the ground by introducing solutions.

- An example of positive impact is a case where AI based cameras[4] were installed to serve as early warning system to villagers for snow leopards in Gilgit in Pakistan. Farmers are no longer trapped in the cycle of fear and economic loss, and this has given them peace of mind and improved their mental health considerably. Seeing the impact of this intervention, they have begun to embrace non-lethal deterrent methods, such as improved fencing and scare tactics. The Predator Early Warning System has not only protected their livestock but has also kindled a newfound appreciation for wildlife's role in the ecosystem.
- An example of negative impact or negative unknown consequence is cameras being used as new way to harass women in India that were installed to monitor tiger movements and prevent tiger attacks[5].

We note that religious attitudes can vary, but what is common about any situation is that challenges can be converted into opportunities if we keep an open mind.

- For instance, snakes are seen negatively by Muslims (but are revered by Hindus). Snake bites become a menace for many villagers in Pakistan, especially during monsoon rain season, but it's also true that Pakistan is an unexplored toxin biodiversity goldmine. So instead of just seeing snakes as nuisance to be killed, there is great potential to earn billions of dollars by producing more than 20





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medicines from snake venom[6].

- Another example is religious practice of parading elephants during many Hindu template ceremonies. This causes a lot of cruelty to the wild elephants and poses danger to human crowds too because they can get trampled by panicked elephant. So, in India, robot elephants that look and act like a real elephant are now being made, thus creating a win-win case of helping both the real elephants and humans[7]. Psychologically, it's all about identifying the vicious cycles and looking at what makes it so, to convert them into virtuous cycles instead.

4. Conclusion

Together, let us increase investments to scale up working solutions to prevent human-wildlife conflict. No one solution fits all. They are layered, multifaceted, and interconnected just like a web. We are all part of the solution, because we are all connected. Mitigation should evolve away from short-term symptom fixes like culling towards long-term sustainable solutions to prevent conflict. It's during dire times that we wake up from the existing status quo and move together to create a better future. Necessity is the mother of invention.

The good news is that we are not yet past the point of no return. It is high time that we make climate action relevant to us both professionally and personally instead of dismissing it as irrelevant to us actuaries. We are near the edge of chaos of major tipping points approaching certain ecosystems, which can make irreversible changes with devastating consequences for humanity[8].

To sum it all up, we have interpreted climate change risk resilience in different ways, but the point is to act and change this situation for the better via climate action even if it is a drop in the ocean because drop by drop becomes an ocean eventually.

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