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Presidential PERSPECTIVE

Lusani Mulaudzi, President, 2020-21

"I HOLD EVERY MAN A DEBTOR TO HIS PROFESSION"

This is a famous saying by Sir Francis Bacon[1] who was a lawyer, a politician, a librarian, and a writer during the Renaissance period, also known as the Elizabethan period or Age of Shakespeare. The full quote says, **"I hold every man a debtor to his profession; from which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves, by way of amends, to be a help and ornament thereunto".** I must confess that I had to look up some of the definitions, not exactly the kind of language a lad from Limpopo would be accustomed to.

TRANSFORMATION IS NOT JUST QUANTITATIVE BUT ALSO QUALITATIVE – **UNDERSTANDING AND ACCOMMODATING DIVERSE VIEWS WHILE MAINTAINING HIGH STANDARDS OF PROFESSIONALISM.**

Many actuaries enjoy privileges that most other professionals find difficult to attain early in their careers. I have the privilege to serve on several boards and I am sure this was made possible to a large extent by my being an actuary. The reputation that comes with being an actuary is not to be underestimated. I am a debtor to my profession and I therefore embrace my duty to advance this profession. I understand that my actions, my words, and my work have the power to build or to destroy the reputation of the actuarial profession.

Nothing is as revealing to the true essence of something than a crisis. The world is still facing a pandemic that has forced institutions and individuals to operate differently. Individuals had to learn to manage themselves a lot more while working from home and students had to be more responsible for their own education including writing exams from home. Governments had to take on more responsibilities to manage this crisis but their actions at times clashed with individual liberties. This led to more individuals entering the public policy arena and new organisations forming to address public policy concerns.

The actuarial profession's involvement in public policy has traditionally been very narrow and the COVID-19 crisis presented an opportunity to reset our role in public policy. A risk averse approach would dictate that we remain in our "lane" and excel in our narrow focus. However, actuaries around the world and here in South Africa recognise that to remain in our traditional "lane" could make the profession less relevant in future. Actuaries have a duty to serve the public interest and the public policy arena presents this opportunity. An ongoing conversation within the profession is about how best to engage in public policy in a way that will enhance the reputation of the profession. Is it possible to engage in public discourse outside of principles of professionalism as contained in the code of conduct?

In my youth (not so long ago) I was actively involved in party politics at national and provincial level. I was always very mindful that any bad behaviour during political discourse could affect my professional standing. The line between our roles as active citizens and our roles as actuaries can be blurred but it is important that there is a shared understanding across the profession of what constitutes unprofessional or unacceptable behaviour in various roles. The ethics article in this edition highlights other ethical considerations for actuaries. I expect this conversation to continue and I invite you to submit articles discussing this question.

The profession continues to transform demographically and currently 46% of the total membership is non-white compared to 9% in 1998. Transformation is not just quantitative but also qualitative – understanding and accommodating diverse views while maintaining high standards of professionalism. This publication contributes towards this by covering views from a diverse range of actuaries and actuarial students. Every ASSA member, irrespective of background has a story worth telling about overcoming challenges, their unique path towards qualification, and their career path after qualification. I trust that you will enjoy this edition and please feel free to send us your feedback on any topic covered in this edition.

[1] https://en.wikipedia.org/wiki/Francis_Bacon

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ACTUARIAL SOCIETY OF SOUTH AFRICA



Mike McDougall (Chief Executive)

EDITORIAL

"WHEN IS AN ACTUARY AN ACTUARY?"

This question has been asked many times, and in many ways, and is likely to be asked more as more people move into the "gig economy". Frank Redington (1906-1984), who was voted the greatest actuary ever in 2003, argued not only that an "actuary is always an actuary" but also that "an actuary who is only an actuary, is not an actuary". Do Redington's broad and all-inclusive answers still resonate in the 21st century when the nature of actuarial work has changed as has the scope of activities carried out by actuaries?

Some argue that an actuary is only an actuary when they are doing "actuarial work". By this definition, an actuary who works as an executive will be an actuary when working with the actuarial team but not when supporting a sales initiative. An actuary who works for a general consultancy will be an actuary when providing some technical support but not when providing strategic direction to an organisation that does not use actuaries.

Another argument is that an actuary is always an actuary and accountable as such. One major actuarial association follows this line and members are required to report all traffic violations and any criminal convictions or fines to the professional body. A failure to do so will be viewed as unprofessional conduct while, depending on the nature of the offense, reporting some may lead to additional charges of unprofessional conduct. Following this approach, a speeding or driving under the influence ticket after a braai could be viewed as professional misconduct.

The ASSA Code of Conduct is principles-based and concise and deliberately non-specific on this. However, it is important that we have an active discussion on this under the leadership of the Professional Matters Board and Council.

In considering this, I was drawn to two more quotes from the 2003 "greatest actuary of all time", Frank Redington. Redington's career spanned the middle third of the 20th century, but his insights are possibly more relevant now than they were then. When considering actuaries' involvement in the public interest, Redington said:

"[Actuaries] should not be content to merely operate as backroom technicians. There is a duty to come forward and to speak out on these questions of national finance – to be prepared to contribute in a forceful if non-partisan way …".

Although Redington was talking specifically about the UK pensions industry when making this statement, with the broadening of the role of the profession, this must include all areas where actuaries can add value to the discussion. Redington went further to emphasise this point when he said:

"The actuary's danger may lie in too close preoccupation with his particular techniques. It is not the tools he uses which make a great craftsman. It is the way he feels and thinks."

This is a critical statement. Although actuarial techniques and tools have both evolved and been revolutionised over the years, the underlying essence of being an actuary has not changed. More than anything else, actuaries are trained to solve problems and bring meaning to quantifiable future uncertainty. It has often been argued that actuaries and engineers are the two professions that are trained to be ready to solve problems that have not yet arisen. It can, therefore, be argued that the key differentiating skill that actuaries bring is a rational and systemic approach to problem solving.

These thoughts lead us to a more dynamic challenging approach to being actuaries – the need to constantly challenge what we do and how we do it as well as the accepted ways of resolving issues. While there is commonality in the underlying approaches and the need to understand risk and financial flows, we should expect there to be vigorous debate inside the profession and between actuaries in the public domain. The standing of the profession is enhanced by these debates being open and orderly with all participants motivated by the need to resolve the common problem without the straight jacket of preferred preconceived solutions. While an emerging consensus position for the profession might be desirable on particular issues, it can be argued that few things will signify the stagnation of the profession more than a consensus position on all issues.

Which brings us back to the initial question – When is an actuary an actuary? This is a discussion and debate that needs to happen in the profession. However, I would take the liberty of using my position as editor to state that, in my opinion, whenever an actuary is making a decision or solving a problem, they are an actuary.

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PaperVideo

ACTUARIAL SOCIETY OF SOUTH AFRICA



ADRIAN GORE:

PRESIDENTIAL AWARDEE, 2020

Adrian Gore received the 2020 Actuarial Society's President's Award for his contribution to the actuarial profession. In making the award, Lusani Mulaudzi said, *inter alia* –

The Actuarial Society of South Africa has an objective to become a global leader in context-based solutions. This is a recognition of what individual actuaries of the Society have accomplished in the past and the belief that our members have the ability and motivation to tackle complex problems in search for solutions. Solving problems is not limited to mathematical equations or something one can do on spreadsheet but includes building impactful organisations – profit or non-profit.

When I attended the International Congress of Actuaries in Berlin in 2018, the insurance leaders gathered there kept on making references to the innovations introduced by a company in South Africa. It is normal to hear businesspeople in South Africa complaining about many things that the government is doing wrong and just what a bad place South Africa is, but not this individual: he sees the possibilities while acknowledging the challenges. It is important for us to acknowledge people who choose to remain optimistic and go beyond just being optimistic but invest in this country's potential.

It is important for us to recognise those business leaders who value the actuarial skillset and have worked to create opportunities for young actuaries to work in diverse fields within financial services.

Adrian kindly agreed to address an Academy@ Lunch session in December last year, where he shared some of his experiences with members of the Society. Yashoda Ram attended the session, and provided the article below.

Nothing leaves a lasting impression quite like being in the company of an authentic leader. Obama comes to mind; distinguished with some swag, but endearing in his manner. Nelson Mandela, who was slow and steady, deliberate and fearless. These personalities are few and far between and having the honour of hearing one such leader speak in an authentic, grounded and unrehearsed way was beyond special, and this is the privilege members of the Actuarial Society had towards the end of the craziest year of our lifetimes!

The Address from the 2020 Awardee of the ASSA Presidential award proved once again: he is in the league of legends.

Adrian Gore took an hour out of his surgically planned day to talk to members of ASSA about what winning the Presidential award for 2020 meant for him. It is no doubt an hour I will never forget and would like to share** the highlights with those of you who were unable to join in. While waiting to

I ENCOURAGE ALL OF YOU TO TAKE A PAGE FROM THIS BOOK; THAT READS LIKE A FAIRY TALE **ONLY BECAUSE IT WAS WRITTEN BY SOMEONE WHO UNDERSTANDS THE POWER OF WORDS, THOUGHTS AND EMOTIONS ON HOW YOUR STORY CAN END.**

begin, Adrian Gore is like any of us about to talk to hundreds of listeners through a Zoom lens, slightly unsure of the how, but crystal clear on the why. Within a few seconds of being introduced by ASSA President Lusani Mulaudzi, he gets into his talk, starting with an expression of gratitude for the actuarial profession, that was so genuine and meaningful that it sparked renewed pride in even my actuarial veins.

There are no short cuts or lucky breaks in becoming as successful as Adrian has. Yet he recalls his life with clarity, pride, gratitude and optimism. It must have been extremely difficult to build the legacy he will leave behind, no doubt, yet he used the words "luck". "fortune" and "hope" thoroughout the talk.

He said how much harder it seemed for actuarial students these days and how the standards of education have progressively wedged a gap in the route to qualifying for many. This is the epitome of a man who has worked as hard as, if not harder than, any of us through exams, yet acknowledges only the grace of passing without embellishing how his own intelligence, wit and perseverance played a role in this good fortune.

I encourage all of you to take a page from this book; that reads like a fairy tale only because it was written by someone who understands the power of words, thoughts and emotions on how your story can end. The joyful references made to how work and family can now be a tapestry of daily habits that is both complex but beautiful was a reminder that our reaction to any situation is the only reality we are faced with. Adrian said he enjoys being able to hang out more with his children, while working from home, and affectionately refers to his kids as his best mates.







THERE WERE SO MANY MORE LESSONS AND GEMS OF WISDOM, **I HAVE SUMMARISED MY KEY TAKE OUTS, ALL PARAPHRASED:**

1. Lead a simple life, but occupy your mind with complex problems that you commit to solving.
2. Be deliberate with your time: work and family are two outstanding sources of joy, don't mess around trying to find other sources of happiness.
3. You don't need hobbies if you love your job, have a purpose in the work you do and strive to make a difference.
4. Sleep and fitness are essential to support both work and family; all you need is 8 mins of elevated heart rate a day and at least 7 hours of sleep.
5. Read - extend yourself by reading complex journals and keep up to date with the news.
6. Do the work, dig deep, set goals, and exceed them daily.
7. People respect you if you have pride. Be proud of your country, and your profession; we have work to do here, problems to solve and value to add.
8. Actuaries have a gift, don't disregard it.
9. Embrace the nerd in you!
10. Connect the dots in a way only an actuary can, but explain the end result so anyone can see what you see.
11. Be an optimist.
12. If working hard makes you happy, don't let anyone convince you it's not healthy. Happiness is health (refer back to 4, though!!)

This was such a tangible reminder that if you think of something as a hassle it usually becomes one and time with our kids is the rarest of commodities, of which we now have an abundance to enjoy instead of wish away in the hopes of returning to the "old normal".

The fibre of this address has stuck with me. Leading into 2021 where no magic switch has turned the light back on for society, I often have to remind myself of the simple power that lies in being optimistic and finding hard work that adds value, and doing it to the best of your ability. That is something worth striving for daily.

For me to be in the company of someone who affirmed a spot in the alphabet, from the time I knew that A is for Actuary, B is for Binomial, C is for Calculus and D is for Discovery, was memorable and the positive impacts still remain. In this vein, we should remember as a profession the immense privilege we have in the work we do and aspire to one day pass the baton on, as Adrian Gore has done through winning this award and sharing his story.

****with consent from the speaker,**

Mr Gore



LOOKING BACK



Marcé Marx

Marcé Marx, Chair of the Convention Organising Committee, looks back on the vital statistics and other features of a unique event.

1 575 Registrations from 23 countries. Although the vast majority (1 514) came from South Africa, there were 15 from the United Kingdom, 7 from Zimbabwe, 5 from Botswana as well as representatives from an additional 11 African countries and 8 countries from around the world.

The 2020 Virtual Convention programme comprised 29 sessions held over three and a half days.

- **The pre-convention African Seminar was included in the Virtual Convention**
- **55 submissions received in response to the Call for Papers and Speakers**
- **87 speakers**
- **21 concurrent sessions**
- **4 plenaries**

There was active interest from sponsors with SA3-South African Actuaries Abroad as the Platinum sponsor with 5 silver sponsors, 3 refreshment break sponsors and a mindfulness sponsor. A further 6 companies had booths in the virtual exhibition area.

Those are the key numbers for the 2020 Virtual ASSA Convention. Despite the challenges, the team hosted what most would agree to be a very successful event. 87% of attendees who were asked how likely they were to recommend the virtual convention to a colleague, rated 7 and above.

We started out planning for the Convention as we do every year and the committee had a few new members who very quickly rolled up their sleeves. Little did we know that this year would be like no other …

I'll admit that I was sceptical about the success of a Virtual Convention. Besides, one of the main reasons most actuaries attend is to network and socialise. I continued hoping that, by some miracle, we would win the war against the virus within a few months and we would not have to venture too far out of our comfort zone. Well … when the CTICC was converted to a temporary health facility, I knew that there was no going back.

Besides all the logistical challenges in the background that few people know about (renegotiating venues and rates, finding new ones, and sourcing an app that would work), there were some major decisions to be made that would ultimately affect the success of the Convention. Some of these included the structure of the event (number of days, number of streams, duration of the breaks), the social event ("socialising" and "virtual platform" don't exactly go together that well) and the plenary speakers. We debated many options, changing the programme multiple times and having quite a few "calls for clarification". Thankfully, our partners, African Agenda, had experience in running virtual events and provided excellent advice. They were also not afraid to try things out and learn, being flexible in their approach.

Compared to a normal Convention, we decided to run the Virtual Convention over three days rather than two, reducing the duration and running three concurrent streams and not five. This was done to reduce the time required connecting virtually while keeping attendees engaged. We also lengthened the breaks in-between to allow attendees to deal with work and personal matters and our sponsors contributed to making these breaks fun and engaging by providing refreshment packs. I've heard that some enthusiastic attendees consumed it all in one go …

Due to the new structure, we could not accommodate all the presentations but wanted to still share the content. We received a number of very good submissions and then opted for poster presentations that were pre-recorded that could also be viewed by attendees along with the others.

Sponsorship was a particularly challenging area. Understandably, it is difficult to invest in something without really knowing what the return could be and not being able to visualise it. We engaged with each sponsor separately to understand their specific needs and help to craft a solution that would work for them. This was a big shift in our mindset and approach, but Jason did a fantastic job here. Despite not having our usual exhibition hall, our sponsors still supported us.

The Socio app was chosen to host the Convention and attendees could also log in on the website. Connectivity in these situations can be challenging but the process ran smoothly except for a few small glitches (including the brief failure of the undersea SEACOM cable!). We used Slido for the Q&A sessions and some speakers also used polling.

The need to keep the audience engaged in a virtual convention was of course important and there were several ways in which this was achieved:

- **Q&A AND POLLS – questions from each session were posted on the Q&A tab. Slido was used for Q&A and these were then read to the speakers**

by the Programme Host in their stream. Live polling was also conducted through the Q&A functionality and allowed for further engagement throughout the day. Three sessions used polling.

- BINGO – There was one bingo game per day on Tuesday, Wednesday, and Thursday. Cards were available from the app for attendees who wished to participate to print and Roxanne Tobias posted the numbers on the WALL throughout the day, acting as the Bingo Administrator. Each day was a different game - a "Sputnik", a "Bowtie", or a "Filled Diamond", referring to the shape on the card that was required. The attendees who completed their cards first posted "Bingo" on the WALL, accompanied by a photo of their completed card. Roxanne then checked their card and sent them a passcode if they were a winner.
- THE BIG GAME – The game consisted of a combination of treasure hunt (passcodes hidden in sponsor profiles, speaker profiles, presentation summaries, and poster presentations), trivia (visit the exhibitor booth, the answer is the passcode), and social media-related (most likes per single WALL post in the morning and afternoon).
- The WALL - The WALL was an active place. THE BIG GAME drove some people there, but others tried it out organically. Kristen (member of African Agenda's Comms Team) provided the support on the WALL and kept an eye out for any issues raised in the chat, or questions not asked on Slido. Some of the sponsors and exhibitors made good use of the wall and generated interest in their booths. The refreshment packs and virtual dinner also featured prominently in the chat.

The virtual dinner was another great idea from the team and required a great deal of planning and organising. It seemed risky at the start, but we knew that, if we got it right, it could be a great success. Delivering the boxes to 164 individuals together with their refreshment packs was a daunting initiative but apart from a few small hiccups, the process went smoothly. The evening was great fun and included wine tasting, a hypnotist, and our host Arabile Gumede who pulled it all together.

Hosting a virtual event still requires some form of physical presence and so three studios were set up in Cape Town for the three streams. Where we previously had a chair for each session on the programme, we felt that the nature of the Virtual Convention requires some form of coordination to keep attendees engaged and achieve a sense of cohesion. As a result, we replaced the chairs per session with two stream hosts – one actuarial and one non-actuarial. Our chairs ensured that we had continuation in the streams and lively discussion about the topics.

Our plenary speakers also received some very good feedback. Under normal circumstances, choosing the right mix of speakers and topics is challenging but this time was even more difficult due to the virtual nature of the event. Despite this, all our speakers – Ferial Haffajee, Leon Wessels, Albie Sachs and Lwando Xaso, and Jeremy Gardiner - did very well and sparked some good conversation across topics including politics, the economy and transformation.

Our presenters connected from home which, as you can imagine, has its own challenges but the dry runs prior to the event helped a great deal here to test connectivity, technical issues and make them feel more at ease. Thank you to all of you for your willingness to participate and making this a success.

We are about to kick off our planning for this year's Convention. If there is one thing I learnt from last year, it is anything can happen and we need to be prepared for last-minute changes. I cannot promise anything in terms of this year's format but it gives me comfort to know that we will deliver another successful Virtual Convention if we need to. Did we make mistakes? Of course. Could we have done things differently? Definitely. But we've learnt and given the circumstances, I believe that it was still a huge success. Thank you to all of you for your resilience, input, trust, and hard work. I look forward to another great year.

PROFESSIONAL IN SOCIETY; INDIVIDUAL IN SOCIETY: THE DIFFERENCE



It is what difference we have made to the lives of others that will determine the significance of the life we lead.

– Nelson Mandela

The word "profession" appears in the English language for the first time in the 16th Century, where it suggests an expression of purpose, involving the well-being of individual members of society. At the time, it was applied to the so-called learned professions, which were those of medicine, law and religion.

With industrialisation, professions entered into an agreement with authorities. In terms of this, the authorities recognised certain professions as the authorised providers of certain services and, in return, the professions undertook to maintain appropriate service levels and act against any of their members who did not act in an appropriate manner.

Professions, simply put, are meant to make a difference in the lives of individual members of the society in which they provide their services. Frank Redington, as quoted in the Editorial of this edition of South African Actuary, referred to the actuary's duty to speak out on questions of national finance.

This, of course, raises a vexed question. Those readers who are experienced enough will recall the FAQ section to the former Professional Conduct Standards. Question 17 was: When is an actuary not an actuary? And the answer was: An actuary is always an actuary.

The Actuarial Society's definition of unprofessional conduct may be summarised as failure in a material respect by a member to comply with the standards of behaviour, integrity, competence or professional judgment which the Society might reasonably expect of the member concerned.

As indicated in the Editorial, the question is about what the Society might reasonably expect of members, and there is a need for further in-depth discussion among members to clarify this.

The first, very informal step in this process was a snap survey conducted among a diverse group of members. To prepare members for the following step, we share the response to Question 1 of that survey. What was your response, or what would it have been?

1. The Actuarial Society's requirements for professional conduct –

a. Apply only to technical actuarial work members do at the office/for employers or clients.

b. Apply to technical actuarial work as described in par a above, but also to non-actuarial work where the member can be expected to use actuarial skills, e.g. analysing financial statements as director of a company.

c. Apply to everything members do in the course of their job, i.e. both technical and non-actuarial, but also includes other conduct or behaviour at the office, e.g. sexual harassment.

d. Apply to all aspects of members' lives and not only to what they do in the course of their job or at the office, e.g. includes driving under the influence, assault, etc after hours.

e. Somewhere between b and c above.

Results from the survey, in which 103 members participated, appear below.

Professional Jurisdiction Survey: Results

Thank you to our 103 respondents, who said the Actuarial Society's requirements for professional conduct –

a. Apply only to technical actuarial work members do at the office/for employers or clients: 2.9%.

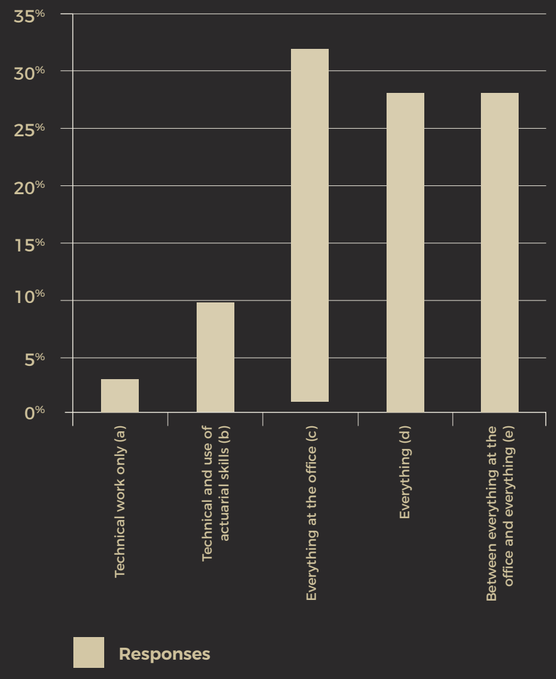
b. Apply to technical actuarial work as described in par a above, but also to non-actuarial work where the member can be expected to use actuarial skills, e.g. analysing financial statements as director of a company: 9.7%.

c. Apply to everything members do in the course of their job, i.e. both technical and non-actuarial, but also includes other conduct or behaviour at the office, e.g. sexual harassment: 31%.

d. Apply to all aspects of members' lives and not only to what they do in the course of their job or at the office, e.g. includes driving under the influence, assault, etc after hours: 28.2%.

e. Somewhere between b and c above: 28.2%.

Requirements for professional conduct





RON HOWROYD

COLOURFUL GENIUS

John van der Linde recalls an intriguing member and pioneer of the actuarial profession. This started as a contribution to the Lockdown Chronicles about someone who had residential property in various countries and spent just enough time in each not to be liable for tax. But there is much more to Ron Howroyd, and this deserves a wider readership. Thank you, John, for a fascinating overview of characters and practices in "the early years".

The late **Ron Howroyd** was a remarkable man and a remarkable actuary.

He played an important role in revolutionising the marketing of life policies in South Africa in the 1960s and thereafter in other parts of the world. Later on in his career he was one of the "early movers" in the calculation of life company embedded values. I will say more about that later in this article.

I have not been able to find any published information about Ron, so I have had to rely on my memories of those days, and on the memories of colleagues from years ago. They have all happily contributed to this project, which says something about how this man impressed the people with whom he came in contact. The names of these friends are mentioned below as I quote them.

I BEGIN WITH SOME BACKGROUND:

When I first came across him, some time after 1966, Ron was the actuary for SA Eagle Life Assurance Company.

SA Eagle, Guardian, Protea and Commercial Union of S.A. were among the composite insurers in South Africa. They were focused on short-term insurance, but also had what were termed 'Life Departments'. All were low-cost operations, relying on short-term brokers who wrote the occasional life policy or retirement annuity. There were few independent life-only brokers at the time, which was the first half of the 1960s.

The main life insurers, Old Mutual, Sanlam and Southern Life, were mutual insurers with their own dedicated sales forces. Other big life insurers were Prudential and Legal & General. They were also constituted as composite insurers, but were largely life oriented, with smaller short-term operations. Like the big mutuals, they also had their own direct-selling sales forces. There were of course other life insurers as well. Very few, maybe none, of the insurers with their own sales forces would deal with insurance brokers, whom they saw as competitors to their own men. (Few women salespeople were employed in the industry at the time).

At the time there was a tax anomaly which allowed profits from "untaxed business" - pensions and retirement annuities - to flow through untaxed to shareholders of proprietary companies.

WHEN I FIRST CAME ACROSS HIM, SOME TIME AFTER 1966, **RON WAS THE ACTUARY FOR SA EAGLE LIFE ASSURANCE COMPANY.**

A number of new proprietary insurers entered the scene, including SA Eagle's life operation, which had been reconstituted as SA Eagle Life Assurance Company.

The new insurers saw the gap and focused on the sale of retirement annuities, recently allowed in terms of new tax legislation. They chose to do so via independent brokers, many of whom in the early 1960s had set up operations to sell units in unit trusts, an industry that had recently been established.

The new insurers could pay higher rates of commission than the main life insurers as they did not have to recruit, train, house and manage sales forces. They could also pay "production bonuses" on a sliding scale: the more business, the higher the overrider.

The inevitable happened. Attracted by the lure of higher commissions and the better perceived status of being a broker rather than an agent tied to one company, salespeople left their employers and became independent life brokers. One entire branch of Prudential, the North City branch, left and set up as North City Brokers. They became major players in development of the life broker market and the marketing of life assurance.

Over the next few years, the big banks also entered the scene, setting up broking subsidiaries and staffing them with representatives ("reps") recruited from the life companies.

There is a lot more that can be said about the operating environment at the time, but I think that I have given sufficient background here.

NOW, BACK TO RON HOWROYD.

He was born in 1924 in Holborn, then a poor part of London. He grew up in wartime Britain. On leaving school, Ron served in the armed forces in the later years of WW2.

Duncan Ferguson worked with Ron Howroyd in the latter part of Ron's career and got to know him and his wife Jean. Duncan writes of Ron, "He went to a village school in Norfolk where there were four classes, one in each corner of the schoolroom, and pupils moved from one corner to the next as they grew older. I don't know what qualifications this gave him, but it was consistent with 'the poor man's profession'. The majority of his generation of actuaries joined from school and went on to qualify on merit by passing the exams rather than having to be articled (and in 19th century pay for articles) as in other learned professions. In contrast, by our day over 90% of actuarial students had a university degree."

When I asked John Rich if he remembered Ron Howroyd, John replied, "I surely did know Ron - he was my boss for my last five years in Johannesburg and indeed I finished up in SA Eagle as Joint Actuary with Ron".

John writes about Ron's introduction to the actuarial profession: "After some looking around after the war he approached (I think it was the Clerical Medical and General) to be accepted as a student actuary. He was given a thorough grilling during this interview by the senior actuary and was grudgingly given a position because he was an ex-serviceman. With typical energy and learning more mathematics as he went, he sailed through the exams."

Having qualified as an F.I.A in 1955, he decided to give South Africa a try. "He came to Johannesburg and started up as a consulting actuary. He found a specialised niche in the subject of compensation for loss of earnings due to death by accident." This would have been some time in the late 1950s.

Ron and his wife Jean, whom he married in 1956, wrote the first local paper on compensation claims and the first published paper by a member of the Actuarial Society of South Africa:

Howroyd, R. & Howroyd, F.J. (1958). The assessment of compensation for loss of support. South African Law Journal, LXXV(I), 65–83.

Jean was a lawyer or an advocate (John says "A legal fundi"). I wonder whether they had met overseas and that she was thus the reason that he came to South Africa. Perhaps by preparing reports for her he was able to get his consulting practice going. Maybe they met consulting on a compensation claim? A romantic thought, but who knows?

John Rich continues, "I am not sure when Ron joined the South African Branch of the Eagle Star of London - it became the SA Eagle shortly afterwards. He interviewed me to become his assistant actuary and between me accepting the position and starting work with him in 1965 the tragic accident that killed the three oldest of his and Jean's four children occurred. With typical energy they produced three later children who were born exactly one year apart. (I am godfather to one of these)." Ron and Jean were exceptional and extremely unusual people!

Duncan Ferguson recalls, "All seven of their children (who were boy, girl, boy, girl, boy, girl, boy) had their birthdays in the same week. Jean had planned it so she could give birth immediately after the Courts closed for the summer so childbearing wouldn't interfere with her career."

SA Eagle had converted their Life Department into a subsidiary, "SA Eagle Life", with Ron Howroyd as their Actuary.

Now - the middle 1960s - was his opportunity to come to the fore, to bring his many and varied talents to light.

He got his company into the game with a retirement annuity, the GIRAF plan - "Growth Investment Retirement Annuity Fund."

Until that time life insurers had smallish no-nonsense rate books that could fit into a man's jacket pocket. Policies did not have fancy names. At Old Mutual "Table 1" was whole life with profits. "Table 1N" was whole life assurance without profits.

HOWROYD WAS ONE OF THE FIRST TO USE MARKETING SEMINARS FOR PRODUCT LAUNCHES. **INVITED BROKERS WOULD PACK OUT A VENUE, JUST TO HEAR RON SPEAK. THEY LOVED HIM. HE WOULD CONDUCT THE SEMINARS HIMSELF.**

Traditionally, profit sharing in the industry was by way of reversionary bonuses, but the new players had policies with benefits that varied in amount according to the investment performance of the unit trusts to which they were linked.

Eagle's GIRAF plan was one such policy, with benefits related to the investment performance of units in the National Growth Fund (NGF) Unit Trust. The details did not come in a rate book, but in a large glossy brochure with a picture of a giraffe on the front. Ron wrote the marketing material himself, using basic English - plus a lot of hyperbole.

John Rich remembers attending a meeting with a top director of the National Growth Fund. "The NGF man queried whether we shouldn't have a more traditional style of life policy. Tradition could be used, he said, in one of two ways. Like a lamp post you could lean upon it or you could use it to light the way forward. Ron, never the traditionalist, replied that you could also use it in the way a dog would!"

Howroyd was one of the first to use marketing seminars for product launches. Invited brokers would pack out a venue, just to hear Ron speak. They loved him. He would conduct the seminars himself.

The dreadful experience of losing his older children may have turned Ron prematurely grey in his 40s. I remember him as a slender man of medium height, looking very English in a single-breasted suit and waistcoat, with wiry erect grey hair and wearing big dark-rimmed spectacles - almost a caricature of the layman's idea of a back-room actuary.

However, once he was on a stage that normally quiet man became a dynamo, moving about and clutching the microphone like a pop star. Ron had a slight stutter which he used to good effect to get attention. Brokers would hang on his every word. Attractive young ladies would be on hand to pass portable microphones to those in the audience who wanted to ask questions.

Afterwards, brokers would be entertained with eats and drinks, leaving with sales kits and brochures that could be handed to their clients.

John Rich writes, "The one great lesson I learnt from Ron was to organise meetings with your top sales people to launch any new product, However, the real reason was to hear from these people what the market was wanting and never say no, it can't be done. 'Keep flexible and flourish'."

I was for much of my time the only actuarial assistance he had. He was a hard but mostly reasonable taskmaster. In 1966, for instance, I finished up in hospital. GIRAF was launched and I had been responsible for much of the design and actuarial calculation. Ron visited me in hospital and said I must be bored but we must get on and he had some ideas for pension plans - 'Read them and give your ideas, John'.

I remember "IMPALA" as being another of the plans, again with a brochure with an animal on the front. I think that this stood for "Inflation-matching pension and life assurance".

Competitors began to copy the Howroyd/Eagle approach with brochures of their own. I was involved with Old Mutual's launch of "Moneymaker", a linked endowment plan, also with an attractive brochure - and a "Moneymaker" bumpersticker!

The actuary of Legal & General was a traditionalist and a cynic. He was not impressed. He spoke about registering the SPRINGBOK retirement annuity fund. This would be "Special pension rights including no gimmicks, bull or k.."

I digress, but the point I am making is that many life insurers jumped on the bandwagon, following the approaches pioneered by Ron Howroyd.

Young actuaries at opposition insurers were roped into the fray, pushed into the front line and given titles such as "Marketing Actuary". It was all a lot of fun, thanks to Ron.

Another thing that Howroyd did was to redesign what in those days was called a "Proposal Form", the application for life insurance.

Until then these were long forms - several A4 pages - with lots of health questions to be answered so that underwriters could properly assess each risk. There was no ticking of boxes - questions had to be properly answered. The forms were carefully worded, with wording approved by lawyers.

Howroyd cut all that out. The forms used by Eagle were attractively designed, short and snappy with very few simply worded questions that could be answered by ticking a box. There was one important "catch all" question, something like "Do you have any reason to think that you are not in perfect health?". I can't remember the detail of the wording after all these years, but you get the idea. Brokers loved the simplification. Traditional insurers thought it heresy.

I remember Old Mutual's then doctor comparing these short forms to bikini swimwear. "The information concealed was more important than what was revealed", he said.

A number of the newer insurers, supported by reinsurers wanting to get into the market, followed this underwriting route pioneered by Ron Howroyd.

Here is another Howroyd story of those heady early days: Fred Haslet, the SA Eagle CEO, had refused to give Ron more office space for his rapidly expanding life team. Ron had his eye on the boardroom, but nothing could be done until after the next Board meeting in six months when all the London bigwigs would be attending. So Ron went out and bought an axe and proceeded to chop off a leg of the boardroom table before saying "Now can I have the space?"

The inevitable followed. SA Eagle Life was too successful. The company took on so much business that more and more capital was required. Ken Browne, who had worked for Eagle Star in the UK wrote, "One anecdote from Ron's time at SA Eagle linking in with your comments on the sales success of the new products - I was told that one year Eagle Star sent a telex message to SA Eagle "Very concerned new business strain" to which Ron very helpfully replied "And so you should be"."

At this stage - it could have been around 1969 - Duncan Ferguson recalls that Howroyd had to be rescued from South Africa. "One of his speeches so offended the insurance industry that they threatened to expel SA Eagle from the Life Offices Association. Ron said he wrote the speech deliberately in order to achieve this result. It was the great 'flotsam and jetsam' speech that I kept for years but can't now find."

The UK parent eventually decided that enough was enough and sold a majority holding of their life company to African Life. The name of the company was changed to African Eagle Life. Thereafter SA Eagle was a short-term insurer only - "number 5 in the big 4", as a short-term colleague called them.

Ron Howroyd and others inspired by him had shaken up many aspects of the life insurance industry, so much so that in 1971 the Government - for other reasons as well - set up a "Commission of inquiry into the long-term insurance industry". This commission submitted its findings and recommendations in 1976.

Ron Howroyd had been a shooting star that had brightened up the South African skies and then vanished in a puff of smoke. He had blazed a trail for others to follow. A lot of feathers were ruffled on the way. I know that I am mixing a few metaphors here!

After Howroyd left South Africa for London he worked on Eagle Star International Life operations. Ken Browne writes, "A major accomplishment was setting up the offshore operation in the Isle of Man with another office in Hong Kong. These offices focused on ex-patriates and their special requirements due to special tax situations (a subject of particular interest to Ron who did not believe in paying tax and organised his life for many years to ensure he was never liable for tax anywhere). Once this was set up, Ron moved to the Isle of Man to run the operation."

Duncan Ferguson writes: "I joined Eagle Star in England in 1975 and was recruited by Tony Ratcliff to work for Ron who had just returned from Melbourne where he had replicated his South African experience and launched Eagle Living Insurance with Australian Eagle. The products were out of the same stable as GIRAF and IMPALA; the algebra behind them utilised the same profit testing and embedded value techniques which were contemporaneously being developed and popularised by Tillinghast (although without any collaboration as Eagle Star never used Tillinghast).

Once the product had been designed and accepted by the Regulators, the marketing was everything, with large bright-coloured ratebooks, provocative advertising and massive launch parties for intermediaries. This resulted, as in South Africa, with a growth in the intermediary market. There were of course Ron's special brand of speeches. He knew how to shock and how to entertain but those speeches were hard graft. When I worked with him, every time I thought a speech was perfect Ron would carry on polishing and honing it with yet more all night sessions, after which he would learn it by heart and then use cue cards to deliver it. It might have come across as spontaneous but for Ron each one was a carefully staged theatrical performance.

Getting regulatory approval was always a challenge because the products were innovative. In Australia, after months, if not years, of negotiation with the Regulator, in exasperation Ron issued them with a Writ of Mandamus. It had never been used in Australia, and rarely in England, and is a little-known archaic law which requires a public servant to stop prevaricating and take a decision.

From 1975 onwards and until Ron retired some 12 years later, the mission was to introduce Eagle Living Insurance to the World. We set up companies alone or in partnership with local businesses in France, Spain, Portugal, Ireland, Greece, Cyprus, Malta, the Lebanon, Israel, Jordan, Tunisia, Morocco, Sri Lanka and Malaysia as well as the international companies you mention in the Isle of Man and Hong Kong.

In it's heyday the International Department (there were four of us: Ron, me and an actuarial student and a PA to mind the shop in London) was generating two-thirds of Eagle Star's worldwide new business. Everywhere the basic formula was the same but adapted to local regulations and markets. At the time, both Ron and I loved travel and the challenge of doing business in new places with different languages and cultures. One of Ron's precepts was 'I only do business in nice places'. It all started in South Africa, a nice place to start."

Morris Bernstein remembers Ron: "In the late 70's I think SA Eagle and African Eagle each had an equity interest in each other and Ron worked for Eagle Star international and came to South Africa for a few weeks to do new rates for African Eagle. He worked closely with Bill Haslam, Les Blignaut and me.

We had an unbelievable time working with him. To say he was a genius is a big understatement of his ability.

He was very eccentric and we had a lot of fun and laughter with him. He loved launching to brokers and they adored him. He always fantasised he was in a big hall with a thousand brokers and then there was a crescendo of loud music and the curtains would open and to thunderous applause Ron would come to the front of the stage and say 'I am back'! It was an amazing privilege to work with him.

He was very outspoken and on occasions rocked the boat by what he said but Ron was never worried about it. There will never be another Ron Howroyd. He was totally unique."

Ron was in many ways a genius, not at all fierce once you knew him and, on the contrary, **AN INCREDIBLY WARM-HEARTED MAN GENEROUS OF SPIRIT.**

Another person who met Ron years after he had left South Africa was Ian Owen. As a young man in his thirties he was appointed early 1987 to succeed Howroyd as CEO and Appointed Actuary of Eagle Star International Life on his upcoming retirement in August of that year. Ian flew to the Isle of Man to meet Ron.

He writes "I had never met Ron, but he was a bit of a legend throughout Eagle Star with a reputation for establishing fast growing Eagle Star offshoots around the globe whilst leaving operational chaos in his wake, for falling out spectacularly with colleagues, and for firing people on the spot. Even very senior people seemed to quake at his name with a mixture of admiration and fear.

Ron was due to meet me at the airport. Instead he sent someone else with the message that Ron had gone to buy potatoes. I thought I must have fallen out with him without ever having met!

That turned out to be far from the case. Once he turned up, he made some introductions in the office, then whisked me off for a tour of the Island, followed by a home cooked dinner at his house (complete with potatoes!). He insisted that I spend the night and we chatted away well into the small hours. He couldn't have been more considerate and kind and was the perfect host.

I came to know him quite well over the ensuing few months. I would travel over every week for a day or two; always to be met by Ron at the airport and taken back to his place.

We exchanged stories about profit testing. I had essentially taught myself profit testing after attending a seminar and introduced it to Eagle Star in the UK in order to design the unit linked Rainbow range. I was amazed to find that Ron had to all intents and purposes invented it as far as I could tell!

His invention of the "Eagle" as a unit of currency for international investors was sheer genius (£1+$2+4Dm+500Yn).

He was way ahead of the UK in technology. Spread sheets using Lotus123, an office email system, a fax machine next to his desk and two telephone lines going into his office. He claimed that the desk had been the Chairman's desk in Threadneedle Street. I have no idea whether that was true, but it certainly was a beautiful mahogany desk.

He introduced me to the concept that you could run a company from any functional head position, giving examples from his career; as well as the threat of issuing a Writ of Mandamus to any difficult public servants; together with the principle of always negotiate from a position of maximum unreasonableness - something that both my wife and I subsequently adopted and regularly apply in our business dealings. Another expression I picked up from him was "what is money for if not to spend on marketing?". He had a reputation for being fierce, but what became clear was that it was all an act and extremely well-rehearsed - always with a particular objective in mind.

I was sad to hear of his passing. Although I only knew him for a short while and at the very end of his career, he has left a lasting impression on me and my family. Both my sons are actuaries.

Ron was in many ways a genius, not at all fierce once you knew him and, on the contrary, an incredibly warm-hearted man generous of spirit. I deeply regret not keeping more in touch as he started his new life in his "residence secondaire" overlooking Lake Geneva and his "secondary residence" in Kent, which coupled with his South African domicile led him to conclude he was pretty well not subject to tax anywhere!"

Now here is a view of Ron from someone in another industry altogether: Monty Hilkowitz recalls the view of Darryl Phillips who ran a prestigious advertising agency used by Liberty Life. During the course of a chat one day, Darryl, who earlier in his career had been the marketing manager of NGF, recalled the wonderful experience he had working with Ron in his days at SA Eagle Life to develop the GIRAF series of life policies. Monty writes: "He said to me that in the course of this involvement 'for the first time in my life I experienced what it was like to work with genius'."

Although I lost track of Ron's movements after he left South Africa I remember being told that he was one the early proponents of the concept of determining embedded values of life companies. Duncan Ferguson touches on this in his recollections above.

I have managed to trace the title of a paper that he wrote after his retirement, published in 1991 in the Journal of the Staple Inn Actuarial Society: "Projections, Embedded Values and Business Plans: A simplified example".

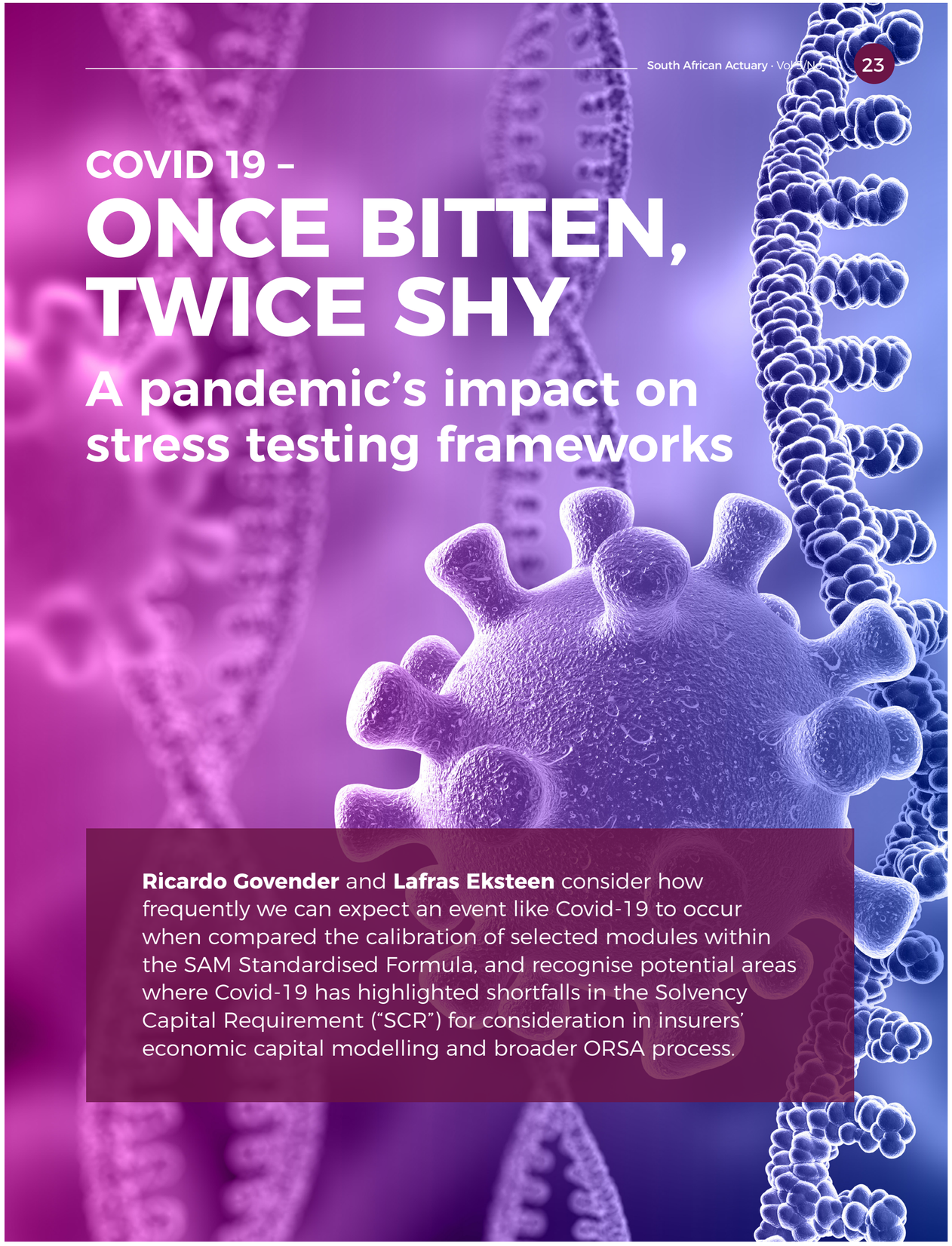
I leave it to others to decide whether Ron Howroyd, the marketing leader in South Africa in the 1960s, was also an early leader in the "EV" area. If so, then the far-sighted Ron Howroyd should also be remembered more widely for his involvement in this innovation that "took off" around the world, thanks largely to the enormous advances in computing power since those early days.

Ron Howroyd made an impact in South Africa and elsewhere in the world. He certainly left an impression on many people who met him.

He died in 2014, in Gravesend, England.

It is good to have known him all those years ago, even though it was at a distance and as a competitor.

John van der Linde
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COVID 19 –

ONCE BITTEN, TWICE SHY

A pandemic's impact on stress testing frameworks

Ricardo Govender and **Lafras Eksteen** consider how frequently we can expect an event like Covid-19 to occur when compared the calibration of selected modules within the SAM Standardised Formula, and recognise potential areas where Covid-19 has highlighted shortfalls in the Solvency Capital Requirement ("SCR") for consideration in insurers' economic capital modelling and broader ORSA process.

INTRODUCTION

As we reflect on 2020 that seems to have gone by in a flash, we have seen the remarkable ability of the human race to adapt and innovate, with the insurance market being no different. Remote working was set up with near perfect transition, that saw insurers adapting to change and the use of technology on a level never seen before in the insurance sector. However, the negative impact of the Covid-19 pandemic did leave its mark, from the tragic loss of life to the significant economic and societal impacts and, of course, the specific effects on the insurance sector.

With the promulgation of the Solvency Assessment and Management ("SAM") regulatory framework on 1 July 2018, insurers have increasingly asked the question of what a "1-in-200-year" event would actually look like. This paper aims to explore how frequently we can expect an event like Covid-19 to occur when compared the calibration of selected modules within the SAM Standardised Formula. It further goes on to recognise potential areas where Covid-19 has highlighted shortfalls in the Solvency Capital Requirement ("SCR") for consideration in insurers' economic capital modelling and broader ORSA process.

THE JOURNEY THUS FAR

If we look back to March 2020 we can remember that equity markets were in freefall, worldwide lockdowns were imposed, social distancing was the new norm and both fist pumps and elbow shakes were gaining traction. At the time many felt like Henny Penny and was thinking that the sky was falling. But was it really a 1-in-200 year event when compared to the underlying calibrations of the Standardised Formula?

In answering this question, we look at the key risks that are captured by the Standardised Formula SCR, namely market risk, life underwriting risk, non-life underwriting risk and operational risk, and assess how the emergence of those risks under Covid-19 impacted on insurers' solvency.



Market Risk

In the market risk module we saw that equity risk, interest rate risk and currency risk were the risks within the Standardised Formula that were most significantly affected by Covid-19.

Equity Risk

According to the calibrations of the Standardised Formula, which consider annual movements of an insurer's overall equity exposure, the MSCI World Index saw a 1-in-9 year event for the 12 months ending March 2020 (13% fall from March 2019 to March 2020) while the JSE All Share Index experienced a 1-in-10 year event over the same period (21% fall). However, we could also consider the intra-year drop in the JSE All Share Index from its pre-crash high in December 2019 to its lowest point in March 2020, which was a significant fall of 34%. But even this movement translates to only a 1-in-100 year event according to the Standardised Formula calibrations.

With equities comprising only 14% of non-life insurers' investment portfolios on average[1], the impact of the falling equity market was not as significant as might have been expected. In contrast, life insurers were more exposed with equities representing on average 43% of their overall investment portfolio[2]. Despite this, however, most of these equity investments relate to investments made on behalf of policyholders through with-profits policies and linked business. With this risk passed on to the policyholders, most SCR ratios of life insurers were largely unaffected. Insurers who offer downside protection on their equity-backed policies did see a significant increase in their investment guarantee reserves, with the fall in the markets also resulting in an increase in the volatility of equity markets, with some of this offset by the hedging strategies that were employed.

INSIGHT BOX

It is imperative that insurers are well prepared for these extreme market movements, with a clearly defined approach for investment decisions under such conditions, allowing careful and objective consideration when markets are in free fall, reducing the risk of knee jerk reactions. This should include a focus on the hedging of investment guarantees and stress testing the effectiveness of those hedges under extreme market movement scenarios.

Currency Risk

Similar to equity risk, the Standardised Formula calibrations (considering annual movements) suggest that the GBP/ZAR movement for the twelve months to April 2020 equates to a 1-in-10 year event (19% depreciation). For the USD/ZAR, we saw a 1-in-17 year event over this same period (12% depreciation). However, as with equity risk, we could also consider the intra-year movement from the most recent strongest position of the ZAR against the USD, in December 2019, to the weakest position in April 2020, over which a 27% depreciation was experienced. Even this only translates to a roughly 1-in-30 year event when compared against the Standardised Formula calibrations.



The average life and non-life insurer have limited foreign exposures and hence the impact of the ZAR deterioration had an insignificant effect on most insurers' SCR ratios over the last year.

INSIGHT BOX

Insurers need to understand the level of diversification assumed in the calibrations of the Standardised Formula to identify areas where economic capital requirements might need to deviate from the Standardised Formula. Whilst the Standardised Formula does not allow for diversification between different currencies, the past year has made clear that the volatility of the Rand is not the same for all foreign currencies, e.g. the USD/ZAR exchange rate tends to be more volatile than other exchange rates.

Interest Rate Risk

Interest rate risk was the most severely affected market risk module, with nominal yields reducing by up to 40% at short durations (equivalent to a 1-in-100 year event) and increasing by up to 80% at longer durations (which is much more severe than a 1-in-200 year event). Subsequent to this volatility, the PA had updated the constituent bonds used to derive the risk-free curve. This update had very little impact at short durations, but significantly reduced the impacts at longer durations. Had the new bond constituents been used throughout 2020 the impacts at long durations would be somewhere between a 1-in-20 and a 1-in-50 year event, depending on the duration. This less severe impact is also more in line with the observed movements in government bond yields.

INSIGHT BOX

Insurers with long-dated liabilities need to assess their exposure to non-parallel movements in the yield curve, e.g. tilts and changes in shape, as these are not considered within the Standardised Formula. This is especially important where asset-liability matching is not based on matching cash flows, but rather based on matching duration or overall movements in liabilities. This shortfall in the Standardised Formula was noted during SAM's development and insurers' risk management functions could benefit from revisiting the relevant position papers and discussion documents to understand the shortcomings of the Standardised Formula, not only for interest rate risk, but also for other risk modules.

INSIGHT BOX

Many insurers have defaulted to using the PA's risk free curve for other calculation bases, e.g. IFRS and Embedded Value reporting, but, after the volatility experienced during 2020, insurers were urgently considering alternative curves. With a variety of risk-free curves available, it's important for insurers to have a sufficiently deep understanding of any yield curve that is used, for example understanding of the curve construction methodology (interpolation and extrapolation), selection of bond constituents and whether historically the curve has displayed desirable behaviour, especially during times of market stress.

THE LOCKDOWN INDUCED RECESSION IS THE WORST ECONOMIC CONTRACTION OUR COUNTRY HAS FACED, AT LEAST SINCE 1960 WHEN ECONOMIC GROWTH DATA BECAME AVAILABLE

INSIGHT BOX

Insurers can improve economic capital models by recalibrating many of the market risk modules, using more recent and larger data sets than those underlying the Standardised Formula. A typical example is interest rate risk, where there is significant experience available beyond the data set that was used to calibrate the Standardised Formula. Recalibrating using more recent data could also better reflect changes in market behaviour, like the impact of technology and automated trading on equity markets.

Life Underwriting Risk

While pandemics have always been a classical stress test for life insurers, Covid-19's far reaching complexity could not have been captured in the simplicity of a theoretical stress test.

Mortality Catastrophe Risk

Covid-19's mortality impact has taken much longer to materialise than the three months assumed in the Standardised Formula and with the anticipated vaccine there is renewed hope that we can now estimate a lower bound for the number of excess deaths. Even without allowing for third or fourth waves, and after netting off other lockdown-related impacts like limited influenza-related deaths and lower accidental deaths, the excess deaths within the South African population could reach anywhere between 150 000 and 170 000 by the end of 2021[3]. According to the Standardised Formula calibrations this could be expected to happen once every 200 to 250 years[4].

Further to this there are also longer-term mortality impacts from both lockdown and the associated economic recession, which have been estimated to be multiples of the direct excess deaths, with this impact being spread over the next 10 years[5]. While these are expected to be concentrated in lower income families where poverty induced deaths are likely to occur, higher income families are also expected to be subject to increased risk from at least a few factors, including delayed cancer diagnoses, emotional impacts from lockdown and potential long-term Covid-19 symptoms. To the extent that these deaths occur in the most impoverished of communities the impact on the insurance industry would be limited, but the loss of human life remains equally tragic. When including the impact of these longer-term deaths the severity of the Covid-19 pandemic becomes undoubtably more severe than a 1-in-200 year event.

Morbidity Risk

Life insurers were also subject to other claim variances, including increases in temporary disability claims due to severe Covid-19 conditions, where waiting periods could be very short, as well as additional hospital cash claims due to Covid-19 submissions, although this is expected to be more than offset by a reduction in submissions arising from elective procedures. There could also be lockdown-related impacts on morbidity claims, e.g. from temporary changes in lifestyle activities and alcohol availability.

Retrenchment Risk

The lockdown induced recession is the worst economic contraction our country has faced, at least since 1960 when economic growth data became available, causing between 2.2 and 3.0 million job losses[6 and 7], well in excess of the 1 million jobs lost during the 2008 Global Financial Crisis[8]. Retrenchment risk might be negligible at an industry level[9], but there are a number of insurers with significant exposure thereto, leading to such insurers recognising large retrenchment losses. This is the second round of such losses in less than 15 years, illustrating that retrenchment experience is highly volatile, but also that it behaves more like a short-lived catastrophe and less like the long-term upward stress included in the Standardised Formula. This is especially relevant for business with shorter contract boundaries, where the impact of such a short-lived catastrophe might not be captured sufficiently by the Standardised Formula.

INSIGHT BOX

Insurers with any material retrenchment risk need to take great care in ensuring their economic capital and ORSA stresses make an appropriate allowance for the true nature of retrenchment risk. In light of its volatility and potentially large and relatively frequent losses, risk appetite policies also need to be reassessed to ensure there are appropriate risk limits in place for retrenchment risk.

Lapse Risk and New Business Volumes

The life insurance industry's lapse experience is always fascinating to observe and 2020 was no different. Despite severe and unprecedented economic hardship there were no massive increases in industry level lapses[10], definitely nothing that suggests we had a mass lapse event on our hands. In fact, some insurers experienced an improvement in lapse rates. This emphasises that any experience item, like lapses, that depends on policyholder behaviour is notoriously difficult to predict under extreme conditions, as it might behave counterintuitively.

New business volumes showed large reductions[10], as disposable income came under pressure and advisor networks were restrained from travelling, placing at least some upwards pressure on per policy expenses.

INSIGHT BOX

ORSA scenarios representing extreme conditions need to consider the possibility of policyholders behaving in unexpected and counterintuitive ways, as this is not only plausible but could also notably change the outcomes of such scenarios.

References:

[3] – Extrapolated from SAMRC Excess Deaths data

[4] – Swiss Re – Pandemic influenza: A 21st century model for mortality shocks

[5] – Business Tech – 'Real and dire possibilities' facing South Africa after lockdown: Dawie Roodt

[6] – Statistics South Africa – Quarterly Labour Force Survey, Quarter 2: 2020

7 – NIDS-CRAM – Overview and Findings, NIDS-CRAM Synthesis Report Wave 1

8 – Business Tech – South Africa lost 1 million jobs because of the 2008 recession – here's why this one could be even worse

9 – Prudential Authority – An overview of the experience of life insurers in South Africa for 2018

10 – Prudential Authority – Summary of QRT data

Non-Life Underwriting Risk

With roughly 80% of non-life premiums being attributed to the motor, property and liability lines of business[11], we have seen that, on the surface, there appears to be a limited impact of the pandemic on non-life underwriting risk for the average non-life insurer, as the risk modules do not specifically cater for the direct impacts of the Covid-19 pandemic. As such, the below are short-term observations that were observed across the non-life insurance market for the average insurer:

- Significant business interruption claims paid and reserved for
- Reduced loss ratios of the motor line of business owing to the lockdown
- Cash backs paid to policyholders to share in this improved motor experience
- Reduced cover from comprehensive to third party, fire and theft
- Increased claims on accident and health, travel and property contents lines of business
- Increased expenses following work-from-home protocols adopted



INSIGHT BOX

With the observation that there was very limited impact on non-life insurers' Standardised Formula SCRs, non-life insurers that use the Standardised Formula as a proxy for economic capital as part of their ORSA process need to critically assess the appropriateness of the non-life underwriting risk modules in light of the current environment, both from a claims and expenses perspective.

Operational Risk

As the Standardised Formula allowance for operational risk is largely a premium and reserve exposure-based calculation, we have seen that, on average, the operational risk allowance for insurers decreased relative to expectations, in line with lower than expected business volumes.

INSIGHT BOX

One would expect that with new work-from-home protocols, increased stress environments and stretched resource capacity following the pandemic, operational risk would increase. However, the Standardised Formula doesn't accurately capture this effect. Insurers that use the Standardised Formula as a proxy for economic capital as part of their ORSA process need to critically assess the appropriateness of the operational risk modules in light of the current environment.

Reference:

1 - Prudential Authority – An overview of the experience of life insurers in South Africa for 2018

2 - Prudential Authority – Non-life industry experience 2018

11 - Prudential Authority – Non-Life Industry Experience 2018

LOOKING FORWARD

With the pandemic not yet over, we have listed below some items insurers should consider when assessing their top and emerging risks within the ORSA process. These items should also be considered as part of the post-stress profit assessment for their Loss Absorbing Capacity of Deferred Taxes calculation.

- Increased lapses and lower new business volumes owing to suppressed economic growth and retrenchments
- Increased risk of defaults and widening of credit spreads as the economy remains fragile
- Impact on the property market and property investments of a permanent shift towards remote working and e-commerce
- Fiscal and monetary policy impacts on the economic environment and wider financial markets
- Longer-term mortality impacts which are still highly uncertain
- Impact on trade credit and credit life business over the next few years following the economic impact of the pandemic
- Potential delays in transformation and other large-scale programmes, including IFRS 17 implementation
- Potential long-term implications on staff skillsets following prolonged remote working, school and university disruption and the related implications for operational risk and scarce skills
- Changes in cyber and security risk related to prolonged remote working and e-commerce

Last year may have felt like more than a 1-in-200 event across the risks the industry faced. But it is safe to say that, bar the remaining uncertainty surrounding business interruptions claims, the industry's capital position was more than adequate to absorb the severe impact, showing the resilience of the balance sheets under the new capital regime. What our analysis has confirmed, however, is that not all of the risks and interrelationships of the risks can be catered for in a one-size-fits all Standardised Formula. It is important that insurers feed the insights and data gained during the pandemic into other elements of their risk management framework, in particular their ORSAs. In this way they will be better informed on the effectiveness of various elements of their risk management strategies as they adapt and thrive in an ever-more uncertain world. As Albert Einstein so eloquently put it: "In the middle of difficulty lies opportunity".

"IN THE MIDDLE OF DIFFICULTY **LIES OPPORTUNITY".**

- Albert Einstein



ROSEANNE HARRIS

INTERNATIONAL AMBASSADOR

With Roseanne Harris being elected the President of the International Actuarial Association (IAA) for 2022 (President-Elect in 2021), we have received queries from members on the role of the IAA and how they can contribute. The Actuarial Society has a history of "punching above our weight" in the IAA and thus had an influence in guiding the direction of the global profession. In this context, we asked Roseanne a few questions on how she became involved and what her new role entails.

South African Actuary: Give us a quick summary of your actuarial life thus far – after you qualified in 1996, where did you go and wat did you do?

ROSEANNE HARRIS: I was a Southern Life bursary student and qualified while I was working for Southern but seconded to the medical administrators, AMA. I had taken the opportunity to work with Ray Welham and I was really lucky to get the opportunity to be working in the healthcare space as actuarial involvement there was starting to develop. At that time Anglo and Southern formed a joint venture with United Healthcare from the USA and I was appointed as a manager there overseeing underwriting and pricing. I went on training to Minneapolis and worked under an ex-pat senior manager. This was the forefront of introducing managed care to South Africa and so it was a steep learning curve in those concepts and in building a new entity. I realised, though, that I was heading for a corporate role which would be more managerial than technical. I took the bold step of branching out on my own and what was initially a stop-gap of some project assignments developed into a consulting business. I operated as an independent consulting actuary for 20 years. It was a very rewarding way to work - being able to take on a variety of interesting assignments and to act in a professional capacity without corporate constructs. I was also fortunate with the timing as healthcare was a new and evolving field. It also gave me the space to do some teaching and research, which feeds my soul, and to become involved in various ASSA activities like the health and tuition committees. My consulting work included health, pensions and general actuarial consulting and also some policy work as well. Of course, I got more involved with ASSA, too, and was nominated as president-elect in 2013, which was a really amazing opportunity and which got me involved in the IAA too. In 2017 Emile Stipp offered me a strategic role at Discovery Health. I wasn't looking to move out of consulting but the offer was really interesting and a great opportunity to pursue some key projects with more support and so I decided to take it up. I have found it to be really stimulating and challenging working with such a motivated team and a great opportunity to focus on strategic projects as well as broader professional issues.

SAA: How did you become involved in IAA activities?

RH: When I was president-elect of ASSA, I started attending the biannual IAA meetings and joined the health, education and social security committees. I really enjoyed interacting with actuaries from other regions and learning about approaches that are both similar and different to how we do things in SA. We always tend to think of ourselves as being a backwater but it has become evident to me that we are pioneers in a number of areas and also greatly respected by actuaries globally who see South African actuaries as resourceful, innovative and technically strong. A real testament to ASSA and the committed volunteers that build our profession's reputation. I got more involved in IAA activities when I was nominated to the Executive Committee in 2017 and then as President-Elect for 2021. I was fortunate at that time to have had guidance from the likes of Desmond Smith and Peter Doyle who helped me understand the intricacies of the IAA and guided me in terms of where to add value. I worked closely with Peter Temple and Peter Withey as well and, along with Mike McDougall and the ASSA executive team we have been able to make meaningful contributions to many of the IAA debates and deliberations.

SAA: What does your role as president-elect of the IAA entail?

RH: The IAA is headed up by the Officers group which is made up of the President-elect (me), President (Jan Kars of the Netherlands) and past President (Tonya Manning of the USA). The Officers are responsible for acting on the Strategic Objectives of the IAA guided by the Council. The Council is like the United Nations of actuaries with each member association having a number of votes according to their size. The strategic objectives of the IAA involve pursuing matters of international interest with supranational entities (such as the IAIS, OECD, ILO and IASB), promoting actuarial professional standards across the globe, engaging on matters of common interest, including professional practice area and educational matters and providing a platform for actuarial associations to engage and share experiences. This is important for preserving actuarial "brand value" as well as ensuring that actuaries have a voice and role to play in global issues, particularly those related to financial and related risk. For example, the IAA has a climate risk task force which is working on identifying and developing the actuarial contribution across practice areas and beyond traditional risk measures.

SAA: Do you foresee any particular challenges in this role?

RH: It is a very daunting task. Apart from the complexity of assimilating actuarial input from across multiple jurisdictions, there are language complications and cultural sensitivities that add to the challenge of global conversations. While the trend towards more common approaches to technical matters such as solvency and financial regulations has certainly facilitated more global cooperation, the need for agility to adapt to appropriate local application makes any development of global standards really interesting! Importantly, the IAA operates on the principle of subsidiarity which means focusing on matters of international interest and ensuring that the local associations take the lead in local application.

SAA: And opportunities?

RH: It is a great opportunity to promote the South African actuarial profession on the world stage and also to promote the role of women in the profession – for the first time in IAA history 2 of the 3 IAA Officers are women. I was also hoping that it would be an opportunity for travel but we all seem to have forgotten how to do that 😁 I am finding, though, that the online engagements are becoming more animated and interactive as we get accustomed to these platforms and I am really excited that this means that many of the discussions are much more accessible than previously. This is a great opportunity for the IAA to become more directly relevant to actuaries around the world.

SAA: Is there a role for an organisation like the IAA? Is it not just a talk shop where people get to meet in fascinating places and grow their own networks, with little actual benefit for the profession itself?

RH: There is always a danger of entities like the IAA becoming a talk shop especially if actions are only taken when there is consensus, which is very difficult

THE PERSONAL GRATIFICATION FROM GIVING BACK AS WELL AS CAREER REWARDS FROM THESE ENGAGEMENTS AND BUILDING YOUR KNOWLEDGE BASE ARE WELL WORTH IT.

to attain, then the organisation can be paralysed with inaction. A key strength of the IAA is the supranational relationships which results in actuarial input being sought on key issues relating to financial supervision and global risks. This requires a mobilisation of views and providing the range of perspectives rather than a single view. Another area of value is the opportunity for testing and benchmarking of standards and practices. There is also the important strategic objective of supporting the growth of the profession in regions where the profession has not yet developed and this is of benefit to actuaries (and hopefully the public) in those regions.

SAA: Would you encourage South Africans to join IAA structures?

RH: I have certainly found it very interesting being part of the global actuarial conversation and I have also formed some valuable contacts. With somany organisations interlinked across multiple jurisdictions access to international contacts is becoming very relevant to daily actuarial practice. So, yes, I would really encourage participation to get an added dimension to topic perspectives.

SAA: Having been involved in the Actuarial Society of South Africa and the IAA as both member and leader, do you have any concerns about the future of the profession?

RH: These roles have given me the opportunity to interact with a wide range of committed volunteers who are passionate about our profession and the contribution we can make to matters of public interest as well as the value of professional conduct in preserving our valuable reputation of having integrity and technical strength. This gives me confidence that the profession is in good hands and will continue to be respected. There are also emerging young leaders who are well-versed in new techniques and technology but also willing to learn to discern how these are best applied and are also more adept at working in multidisciplinary teams with other professions. We certainly need to be adapting to the evolving environment but I am confident that the actuarial toolkit will continue to be relevant and valuable.

SAA: Similarly, do you think there are any opportunities the profession should grab?

RH: We have been working on the opportunity to be recognised as trusted risk experts beyond financial risk with an ability to balance how risks affect multiple stakeholders and develop optimal and ethical management strategies. This brings together technical skills and professional judgement. Positioning the profession as risk mitigation experts and trusted expert ethical advisers is the role we should be continuing to seek to fill. To do this well requires strong and supportive partnerships with other professions and those with key supportive skills. So we need to be building strong relationships with other skillsets and be working in effective teams to ensure our professional judgement is well substantiated

SAA: Finally, if you had to say one thing to the young members of the Actuarial Society – students, recently qualified Associates and Fellows – what would that be?

RH: It may seem that building your career leaves little space for volunteering, but you will be amazed at how being part of ASSA structures creates valuable contacts and gives you perspectives that are key to career building. So, get involved, whether it is in supporting education and mentoring initiatives or in practice areas and research. The personal gratification from giving back as well as career rewards from these engagements and building your knowledge base are well worth it.

Ethics versus Common Sense Morality



Francois Marais is a retired Fellow who breeds dogs and is doing a Master's degree in ethics.

IT HAS BEEN SAID THAT ETHICS IS THE STUDY OF MORALS, **AND MORALS ARE THE PRACTICE OF ETHICS.**



The words *ethics* and *morality* are often used as synonyms but are not quite the same. Most mature actuaries should have a well developed sense of personal morality, but probably only a few have any significant knowledge of ethics as a philosophical discipline.

It has been said that ethics is the study of morals, and morals are the practice of ethics. Ethics is not about *what is*, but about *what ought to be*, or more specifically, how we ought to live. I would like to encourage young actuaries to develop their own sense of morality, by learning a little more about ethics. (It is difficult to teach us old people anything!)

Probably the best introduction to ethics is the small best-selling textbook *The Elements of Moral Philosophy by James and Stuart Rachels*. According to Amazon, the "thought-provoking book introduces readers to major moral concepts and theories in philosophy through clear, understandable explanations and compelling discussions".

Hopefully, the few selected extracts in this article will encourage some of you to buy and read the Rachelses excellent book! (I shall now call them "the authors").

A minimum conception of morality

A problem for newcomers to ethics is that there are competing normative ethics theories, giving different definitions and sometimes conflicting answers to the questions of what constitutes right and wrong conduct.

The authors begin their book by formulating a '*minimum conception of morality*', which they believe should be at the core of any reliable normative moral theory. To explain this, they consider some real life-and-death moral case studies involving seriously handicapped children.

The first case involved Baby Teresa, who was born with a severely malformed brain. She had no consciousness and a life expectancy of only a few days. Her parents wanted to offer her organs to be transplanted. However, Florida law forbade the removal of organs before the death of a donor. By the time Baby Theresa died, her organs had deteriorated so that they could no longer be used. The widely debated ethical question was whether Baby Teresa should have been killed so that her organs could have been used to save the lives of other children.

I suggest you pause for a moment to consider your own verdict.

The parents' wish for offering the organs is supported by the *benefits argument*, which holds that *if we can benefit someone without harming anyone else, we ought to do so*. Transplanting the organs would greatly benefit the recipient babies. It would also cause no real harm to Baby Teresa, since staying alive for a few extra days could have no benefit to a dying baby who had no consciousness or any expectation about life.

The opposing ethicists offered two moral arguments. The first was based on the principle that *it is wrong to use people as means to the goal of another*. "Using" people means violating their autonomy and robbing them of the opportunity to decide for themselves, by forcing or deceiving them to do what you want against their own will. This sound principle was, however, not applicable in this case: Baby Teresa had no autonomy that could be violated: she had no will and no consciousness that could be considered. Taking her organs would not be "using" her and would not violate her autonomy or harm her interests.

The second opposing argument was the principle that *it is wrong to kill one person to save another*. The rule not to kill another person is accepted as one of the most important moral principles. There are, however, some reasonable exceptions to the rule (such as killing in self-defense). Taking Baby Teresa's organs can be considered a reasonable exception, since she had no expectation to live, while her organs could be used to save the lives of other babies.

On balance, the arguments supporting the wish of the parents to donate their baby's organs seemed stronger than those for the legal refusal.

We actuaries must accept that our typical business ethics case study can never be a match for medical life-and-death dilemmas. The authors discuss two more similarly challenging medical case studies, to illustrate the main aspects of what they define to be a **minimum conception of morality**. They conclude that morality is, at the very least, the effort to guide your conduct by reason and impartiality, in which you must:

- provide *good reasons* and valid arguments for your judgement,
- analyze the *true facts* thoroughly and use reliable sources,
- consider *all implications* carefully and be unbiased in your investigation,
- consider *accepted moral principles* that are applicable and correctly applied,
- be *impartial* and give equal weight to the interest of everybody involved,
- be able to provide good reason if you treat people differently.

Normative ethics theories typically aim to provide justifiable reasons why an act is morally acceptable, so that the theory could serve as a generally accepted basis of moral behaviour for everybody. The authors state that not every ethical theory embraces their minimum conception of morality. They conclude that while "all of the classical theories contain plausible elements …. most of them seem vulnerable to crippling objections".

Two contrarian moral theories

There are two contrarian theories on ethics which need our brief attention, since they challenge the validity of all normative moral theories.

Ethical subjectivism

According to ethical subjectivism, there is no such thing as right or wrong. Any moral statement is not a matter of reason but is merely an expression of our opinion or of our feelings. Our sense that something is "really" right or "really" wrong is just an illusion.

According to simple subjectivism, saying that something is right or wrong is just a factual statement about your opinion, that is, whether you approve or disapprove of the action. If that were true, however, there can be no moral disagreement – which is obviously incorrect.

According to emotivism, which is another version of the subjectivism, saying that something is right or wrong is not a statement of fact, but rather an attempt to persuade others by providing an expression of your attitude.

The authors debunk subjectivism. They argue that, while moral statements may well express an opinion or attempt to persuade, that does not mean they are not factual. Moral truths are matters of reason, and a moral judgement is true if it is backed up by better reasons than the alternative.

Cultural relativism

The sceptical theory of Cultural Relativism is based on the observation that conceptions of right and wrong can differ between cultures. The theory uses this observation to claim that there is no objective and universal truth in morality, only various cultural codes. Each society determines what is right and wrong for that society.

Cultural relativists state that no society has the right to judge the moral code of another society, since that would be based on the arrogant assumption that its own moral code is better. Rather than simply saying, "we need to understand the morals of other cultures," they say, "we cannot judge the morals of other cultures".

The authors argue that cultural relativism breaks down from a purely logical perspective. The fact that different cultures have different moral codes does not logically imply that there is no objective moral truth. There may well be a true moral code and some cultures might simply be wrong.

The weakness of the theory is obvious since it makes it literally impossible to argue that anything a culture does is right or wrong:

- **It effectively bars you from condemning clearly immoral practices such as gender oppression in other cultures.**
- **If you live in a country with a rigid social hierarchy such as the caste system, you have no way to argue that your society's moral code is wrong.**
- **The idea of moral progress becomes questionable, since if we condemn slavery in previous societies, we judge that society by our modern standards of morality, and not by their cultural code and traditions.**

Three prominent moral theories

The three most prominent normative ethics theories, deontology, utilitarianism, and virtue ethics, have fundamentally different approaches to answer the question of whether an act is right or wrong:

- **deontology** emphasises *the duties and rules* concerning any action,
- **utilitarianism** focuses only on the *consequences* of an action, and
- **virtue ethics** emphasises the *moral character* of the person acting.

The authors provide a through explanation and evaluation of these three theories. I shall give a brief summary of each and consider its likely verdict on the case of Baby Theresa.

Deontology

Deontology claims that there are moral rules and obligation to be obeyed, and that actions have inherent moral worth. People have a duty to act according to these moral rules, regardless of the consequences.

Immanuel Kant, its main proponent, believed that our moral rules must be derived from our rational capacity and not from any external source such as religion. For him moral goodness only exists if rational people act from a good will and a sense of duty.

He defined the *Categorical Imperative* as the single moral principle every rational person must necessarily accept. This principle can be broadly stated as: "*Act only in such a way that you would want the principle of that action to become a universal law*". The universally accepted moral rules against lying, stealing, killing, breaking promises, causing harm to others, etc, can all be deduced from the Categorical Imperative. Lying is wrong, because a moral rule that allows lying could not rationally be universalised - if anyone can lie at any time, one could no longer believe anything that anyone says.

For Kant, moral rules are absolute and can have no exceptions, regardless of the circumstances. Even if telling the truth would lead to somebody's death, a lie to save his life would still be wrong. Many regarded Kant's insistence on such absolute rules as unreasonable. Deontology can overcome this objection by accepting that a rule may be broken for a reason that can be universalised. The moral rule: "It is wrong to lie, unless lying would save someone's life", would be an acceptable universal rule.

A strict Kantian view of the Baby Theresa dilemma would certainly regard it as morally wrong to kill her and to use her organs for transplant.

Utilitarianism

In the early 1800's, Jeremey Bentham and John Stuart Mill introduced the radical new concept of utilitarianism, which argued that an act is not inherently good or bad and that the moral value of an act depends only on its consequences and nothing else. Mill regarded happiness as the ultimate desire of humans, and therefore the consequences of an act matter only insofar they involve the greater or lesser happiness of all concerned. Moral behaviour is that action which maximises pleasure and minimises pain for everyone, and the happiness of each person affected is equally important. Mill's "*Greatest Happiness Principle*" defines that *an action is right if it promotes the greatest amount of happiness for the greatest number of people*.

One of the most serious shortcomings of utilitarianisms is that it can conflict with the ideal of justice. Consider the situation where a man is accused of a brutal racial killing and where an acquittal would almost certainly lead to serious race riots and the loss of many lives. Even though the judge believes the accused to be innocent, the greatest amount of happiness for the greatest number of people would require a conviction.

THE MORALLY RIGHT ACTION FOR UTILITARIANISM THEREFOR CAN REQUIRE THE UNFAIR TREATMENT OF A PERSON, AGAINST THE DEMANDS OF JUSTICE.

Similarly, utilitarianism can conflict with human rights. It would allow the rights of an individual to be trampled on, if enough people would benefit from the action – what has been called the "tyranny of the majority".

For the utilitarian there would be doubt that killing Baby Theresa so that her organs could be used to save other lives, would be the morally right action. It would promote the greatest amount of happiness for the greatest number of people involved: her parents, the parents of the recipient babies and the long-term expected happiness of the surviving babies.



Virtue Ethics

In virtue ethics it is the character of the person that gives moral status to actions, and not the consequences of an act or its compliance with moral rules. To act with virtue is right and to act without virtue is wrong.

Aristotle, the father of virtue ethics, believed that for a person to realise his or her full human potential requires a virtuous life. Virtues are the important and attractive character traits that everybody need for successful living. We must cultivate virtues, by practising virtuous conduct until it becomes a habit and eventually becomes part of our character.

Virtues may differ between people and between societies, but our common humanity requires that certain virtues are needed by all people. For the ancient Greeks, the"'cardinal virtues" were justice, wisdom, courage and temperance. The authors discuss the virtues of courage, generosity, honesty and loyalty in some depth and list a wide range of admirable characteristics such as compassion, diligence, patience, tolerance and friendliness, to name a few.

ONE OF THE MAIN BENEFITS OF VIRTUE ETHICS IS THAT IT PROVIDES A CLEAR MOTIVATION FOR ACTING MORALLY. HOWEVER, IT CANNOT EXPLAIN WHY A VIRTUE IS GOOD AND IT CANNOT SHOW EXACTLY WHEN AND WHETHER A SPECIFIC VIRTUE SHOULD APPLY.

There may also be conflict between virtues – should you be kind by not telling a hurtful truth, or should you be honest and tell all?

The main objection to virtue ethics is that it is incomplete and cannot stand as an independent alternative to other theories. In a moral dilemma like that of Baby Theresa, virtue ethics provides little action-guidance. The authors suggest that it may be sensible to supplement a conception of right action (such as utilitarianism or deontology) with a conception of virtuous character.

In conclusion

Having considered the most important ethical theories in "a survey of contending ideas, theories and arguments", the authors conclude with their own view of "what a satisfactory moral theory would be like". They call this a Multiple-Strategies Utilitarianism.

If you have read this whole article you must have an interest in ethics. I once again urge you to obtain a copy of *The Elements of Moral Philosophy* and read all 200 pages. You will be a richer person, even if it is the only book on ethics that you ever read.

COVID-19: One Modeller's View

INSIGHT BOX

In the July 2020 edition of South African Actuary, we featured the modelling work done by the Actuarial Society's task team led by Barry Childs. They have since updated the Actuarial Society model they had developed. The Society facilitated a presentation by other modellers later last year. In this edition, we take a look at steps in the development of the NMG model.

Gary Scott retraces his steps and shares some information on the development of the NMG model.

From the very beginning of the Covid-19 pandemic, people have drawn parallels with previous pandemics, like the influenza outbreak of 1918 known as the Spanish flu.

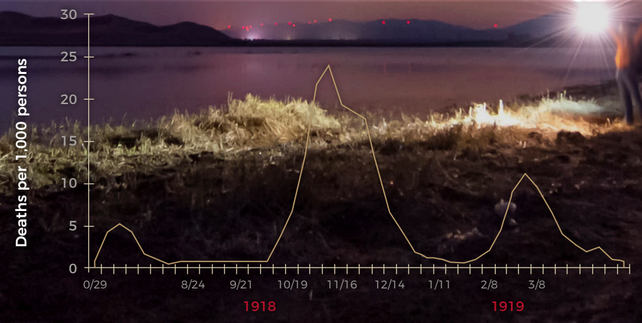
The Spanish flu virus (H1N1) and SARS-CoCV-2 come from different viral families so there are limits to our learnings from the Spanish flu pandemic. However, the mode of transmission of both viruses are very similar. Both are spread primarily through respiratory droplets and in particular through the suspension of liquid droplets in the air.

The Spanish flu did not start in Spain, but rather the first cases were recorded in the US, France, Germany and the UK. The Spanish press reported freely on the impact of the virus, a link was created, and it stuck.

The Spanish flu came in three waves, the first beginning in March 1918. The second started some six months later and was over by December 1918. A third wave started in Australia in January 1919 and worked its way to the US and Europe before dying down by June 1919. Although the virus never completely disappeared, people had developed a collective immunity to H1N1 by 1920.

The first wave was regarded as mild with an infection fatality rate that wasn't unusually high. It was the second wave that was the most severe and became known as Spanish flu. The third wave was slightly less deadly.

The graph below shows the relative strengths of the three waves of the Spanish flu as it was recorded for the United Kingdom.



Three waves of death during the pandemic: weekly combined influenza and pneumonia mortality. United Kingdon, 1918-1919. Three waves were broadly the same globally.
Taubenberger JK, Morens DM. 1918 influenza: the Mother of All Pandemics . Emerg Infect Sis. 2006; 12(1):15-22, CCBY

It is estimated that the Spanish flu killed 50 million worldwide, and for this reason alone comparisons with the SARS-CoV-2 virus should be made with caution.

Modelling SARS-CoV-2

I first heard about the SARS-CoV-2 virus late in January 2020 while visiting my daughter in London. She is a writer for CNN and was working from home to keep me company. Her job entails keeping the CNN website updated with the news of the day. Well, that day the biggest story was this virus that had begun to spread across mainland China from a city called Wuhan. The virus had resulted in a regional lockdown of 60 million people and was responsible for 170 deaths and 7 000 recorded infections.

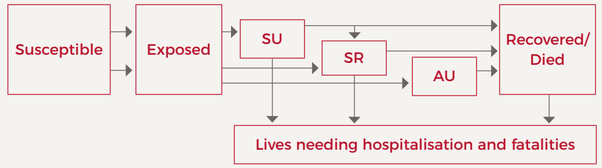
I have just gone onto the CNN website and see that at the time of writing (late January) there are over 25 million infections and 433 000 deaths due to Covid-19 in the United States alone. Most of the world's population is living under some form of lockdown and the virus has impacted all of our lives.

It was in mid-March 2020 that I decided to learn more about the pandemic. I spent some time immersed in all things to do with the pandemic figuring out how to model it for my South African medical scheme clients. There are two experts, Nicholas Christakis and Marc Lipsitch, that I began following on Twitter to find out more about viruses, pandemics, immunity and vaccines. One of Christakis' tweets referred to a fascinating study on the SARS-CoV-2 infections in China and I used this to build a multi-state model for country-level Covid-19 forecasts.

After a number of iterations, the model was adopted by the global actuarial consulting firm, NMG, and used to fit the pandemic in South Africa, Australia and Sri Lanka. As an aside, I recently heard that the NMG model for Australia features in an assignment for their actuarial students! You can access the model for South Africa at **https://nmg-covid-19.sctechnology.co.za**, and play around with the assumptions to get an idea of how they impact the pandemic in this country.

When confronted with a novel problem such as the progression of a disease such as Covid-19, it is often insightful to build a simplified model of the disease progression through the population. A multi-state model is one built to track the progression of lives through various disease stages (or states) using a unit of time such as days, weeks, months or years.

We used the Chinese study to inform the parameters for the early version of the NMG model. A flow diagram of the model is set out below:



An incubation period determines the length of time that a life remains in the "exposed" state before moving to one of the three infectious states, namely symptomatic unreported (SU), symptomatic reported (SR) and asymptomatic unreported (AU). An infectious period determines how long a life remains in one of the three infectious states before moving to the "recovered/died" state.

The NMG model follows the logic of the SEIR (Susceptible Exposed Infected Recovered) compartmental model that was used in the Chinese study. The SEIR logic has two important assumptions about viral propagation that were built into the early version of the NMG model; the first assumes that all lives in a population are equally susceptible to being infected by the virus and the second assumes that once a life is infected with the virus they will have immunity from further infection (at least for the duration of the model).

According to the early results from the NMG model, the SARS-CoV-2 virus was moving through the South African population at a rate of 1.86 new infections for each infected person. At this speed, the model predicted that the virus would infect 86% of South Africans. This translated into a forecast of 176 000 deaths from Covid-19 in South Africa.

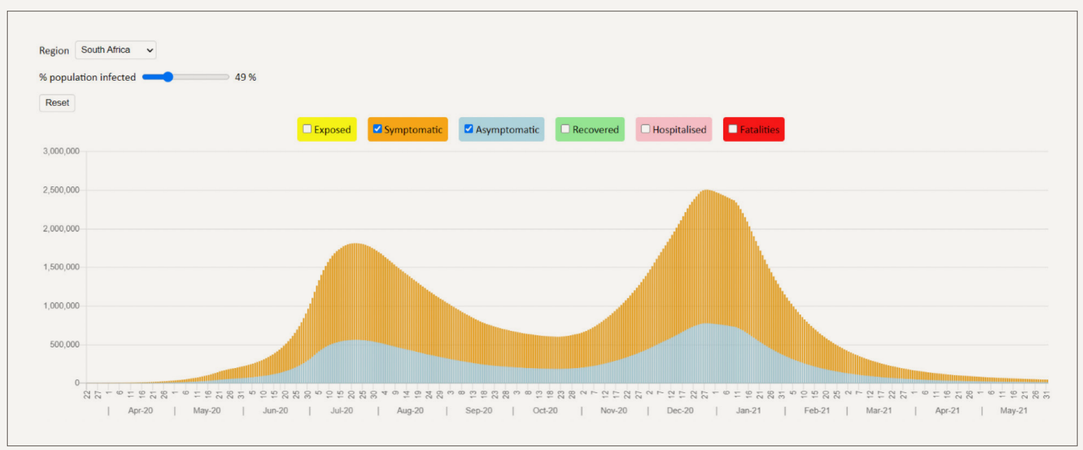
At the time that we were publishing results from this early model, there was a great deal of criticism of the forecasts that SEIR models were publishing in geographies all around the world. It turned out that the logic of the SEIR model is too simplistic and does not take account of the wave-like nature of the progression of a novel virus like SARS-CoV-2 in a population. In practice, the virus will be constrained in its movements by the social contact networks that exist in a

population. The virus will infect the highly connected individuals first, and then the viral propagation will slow down when less connected individuals are left in the susceptible population. Viral propagation will also be impacted by control measures such as lockdowns, social distancing and mask wearing that are often intensified when the viral spread becomes visible in a population.

The NMG model was adapted in May 2020 to allow for waves of infection caused by the slowing down and then speeding up of the viral propagation. This reduced the total Covid-19 deaths forecast by the NMG model to just over 60 000 for South Africa. As it turned out the second wave of SARS-CoV-2 infections was a lot more pronounced than expected and the forecast for Covid-19 deaths from the latest NMG model has increased to 88 000. According to the latest model, almost half of the South African population will have been infected with the SARS-CoV-2 virus after the first two waves.

As the wide range of projections attests, there is considerable uncertainty associated with forecasting the impact of this pandemic. This uncertainty persists even at this advanced stage of the pandemic.

The graph below is from the latest NMG model and shows a forecast for symptomatic and asymptomatic infections.



This brings us to the question of the shape of a third wave. With almost 50% of the population already infected and carrying a level of immunity to the virus, a third wave should be less severe than the second wave. What could impact on this outlook is the occurrence of a new variant of the SARS-CoV-2 virus that is more infectious than the 501Y.V2 variant that is prevalent in the second wave.

We should also consider the scenario where the SARS-CoV-2 virus reappears in wave after wave much like the seasonal flu does each winter. In this scenario, natural collective immunity would not develop against SARS-CoV-2 as it did for the Spanish flu. At NMG, we have been monitoring the extent of reinfections in the medical schemes to which we consult. The evidence to date is that reinfections appear to be the exception rather than the rule, but this could change with another variant of the virus.

AS I WRITE THIS ARTICLE, SOUTH AFRICA IS GETTING READY TO ROLL OUT A VACCINATION PROGRAMME **AND IT IS USEFUL TO CONSIDER HOW THIS MIGHT INFLUENCE THE TWO SCENARIOS THAT WE HAVE PAINTED HERE.**



A vaccine could certainly protect us from a third wave if it is deployed in time. A successful vaccine would also enable us to return to our pre-Covid way of life. Like the Spanish flu, we can expect the SARS-CoV-2 virus to continue to circulate in the population for many years and those never-infected lives would be at risk to infection even if this does not occur on a scale that can be classified as a wave.

In the scenario where SARS-CoV-2 reappears in multiple waves, we would need to rethink the current objective of attaining collective immunity. In this scenario, vaccinations could become a regular occurrence to protect against new variants of the virus as they appear.

We continue to learn about SARS-CoV-2 as we come out of a second wave of infections and look towards a successful vaccination programme. The next few months will be particularly important to get a better understanding of the longer term impact of this pandemic on South Africa, our economy and our way of life.



TORTURE AND COTTON: Little do We Know...

Clarinet *(n)*: An instrument of torture operated by a person with cotton in his ears – Ambrose Bierce.

One of our many sources, whose identity we shall protect, provided South African Actuary with a picture that led to an eye-opening (and cotton-removing!) discussion with David Little, FASSA.



South African Actuary: Is that a musical instrument you are holding in the photo, and do people really dress like that?

David Little: Yes, it is a clarinet. This was a publicity photo for a concert in which I was due to feature as a soloist at a music festival in Simon's Town. Sometimes musicians have to dress like this for performances! Do you not think it is elegant?

SAA: Er... well..., we thought you were an actuary?

DL: I am. In my dreams I really wanted to be a clarinettist, preferably a rich and famous one. After a few years of trying to become a professional musician I saw how very hard it was going to be, with no guarantees of success, or even a living wage. So I changed direction and became an actuary. There really is a strong link between music and numbers, and between classical music and reasoning skills (the "Mozart Effect"). There are books about it.

SAA: How did you start out in your music studies?

DL: I started learning the clarinet at age 11, and at senior school in Zimbabwe where I grew up, I was obsessed with the idea of being a musician, to the extent that I battled to focus on getting my A Levels with decent enough marks to enter university. Music (especially classical) was not a well-appreciated discipline or part of the curriculum at our school, so I received very little encouragement or understanding from the teachers, except to be told that I should pass my A Levels and choose a "sensible" career. Nevertheless I persisted, and at age 15 I won a national competition to perform a solo clarinet concerto with the (then) Municipal Orchestra in Harare, which was a full symphony orchestra. It was very, very exciting for me, and I naïvely thought that this had at last launched my music career!

THE REQUIRED TECHNICAL AND MUSICAL STANDARDS WERE JUST INCREDIBLY HIGH. I WAS DAUNTED BY THE SHEER NUMBER OF HOURS OF PRACTISE AND THE INTENSITY OF THE APPLICATION THAT WAS REQUIRED EACH DAY JUST TO MEET THE BASIC REQUIREMENTS, LET ALONE TRY TO DIFFERENTIATE MYSELF FROM OTHER MUSICIANS.

SAA: Did you get your A Levels, and what did you do next?

DL: I did, and with the encouragement and support of my parents and my music teachers I applied to the Royal College of Music in London, UK, to study for a 3-year Diploma in clarinet performance. I was accepted, received a partial scholarship, and worked as hard as I could but there were many times when it seemed absolutely impossible. I was surrounded by young people who had gone through a very different system where music was part of the school curriculum in the UK. The young people who entered the Royal College of Music were therefore steeped in music from a very early age, to a far greater extent than I had ever been. The required technical and musical standards were just incredibly high. I was daunted by the sheer number of hours of practicse and the intensity of the application that was required each day just to meet the basic requirements, let alone try to differentiate myself from other musicians. Disillusioned and rather exhausted, I decided towards the end of the course that I would prepare for the final exams and secure the Diploma, but that I would take a different career path and would study something easier ...

SAA: ... So you decided to study Actuarial Science?

DL: Yes. A friend told me it was a good way to get a job and earn a decent living. Coincidentally, I had become genuinely quite interested in pension funds and how they worked! My Dad was taking early retirement at the time, as my parents were emigrating from Zimbabwe to Cape Town, and he was making decisions about his (defined benefit) pension. I applied for the B. Sc. in Actuarial Science at UCT, about 3 years older than the average first-year student. I wanted to forget all about music and the clarinet, and I focused very hard on my new degree. The clarinet went into a cupboard where it stayed, neglected and ignored, for 10 years.

SAA: How did you achieve the transition from Music to Actuarial Science?

DL: I simply went into denial that I had ever been a music student, and very few of my friends and associates even knew that I had played the clarinet. Aged 22 by then, I had a strong sense of urgency that I should settle into a worthwhile career path, and I was absolutely determined to become an actuary as soon as possible. I was assisted greatly by a full study bursary from one of the large insurance companies, and when I graduated, I started (with a couple of hiccups along the way) with Southern Life in Rondebosch in the Pensions Valuations department.

SAA: You clearly picked up the clarinet again at some point. When did this happen?

DL: My wife and I were in lockdown in Buckinghamshire in the UK where we had moved a couple of years after our marriage to get some overseas work experience. I had qualified soon after our move, a few months after my 30th birthday, and our first child had just been born in London, our second was on the way, and we were really struggling with being new parents. Being on London's outskirts and on the other side of the world from our families in Cape Town, we couldn't really get out much, so it was a lot like the lockdowns we have been experiencing recently! Looking for something interesting and creative to do (and not having any actuarial exams to enjoy and study for!) I took the clarinet out of the cupboard and started trying to play it again. I really applied myself quite diligently, and after about 6 months of daily practise I was back to a sort of acceptable playing standard. I joined a local orchestra and quite soon I was very involved in a part-time musical life, while working full-time as a pensions actuary for a consultancy in Windsor. I continued in this mode after we returned to Cape Town a few years later.

SAA: And the clarinet has not been consigned to the cupboard since then?

DL: No. Very few days go by without playing the clarinet. At times it was almost impossible to fit in my music interests with my day job, and certainly there have been long periods where musical activity was pushed very far into the background by work pressure, but overall I think it gave me some sort of balance in life. There were many occasions where I would take a half-day off work to play in a music gig somewhere, and sometimes come back to the office with my head-space still in Musical mode rather than Actuarial mode. But usually the music gigs are at night, and actuarial work occupies the daylight hours (and only part of each night!).

SAA: So you play music professionally?

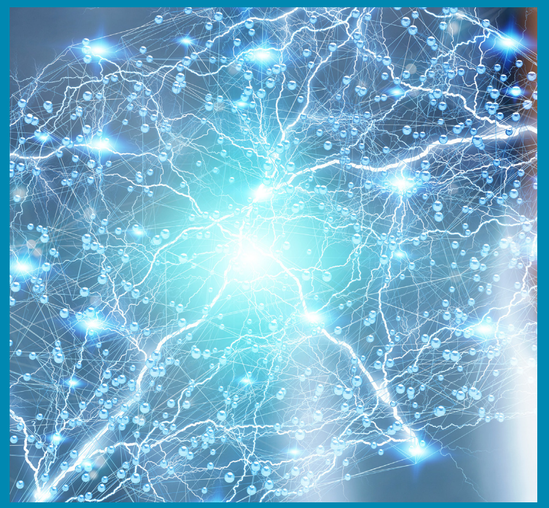
DL: Yes I play professionally, but very much part-time. Strangely enough, many of the musicians I play with at gigs have no idea that I am not a full-time musician. They certainly don't know that I am an actuary by profession. They think I am a musician. It is a classic double life!

SAA: And the instrument that you are holding in the photo?

DL: It was hand-made to order in Santiago in Chile by a notable Argentinian maker who coincidentally studied clarinet at the Royal College of Music a couple of years before my time, and who then decided to become a "boutique" clarinet manufacturer in Chile. It was a very interesting experience going to his workshop in Santiago, seeing how he manually makes the instruments, and testing the instrument before buying. His instruments are very special, and are used by some professional clarinettists in North and South America, and in diverse places including Iceland, Russia, Israel and Switzerland, but as far as I know mine is the only one of these in South Africa.

SAA: And you are still an actuary.

DL: Yes, but no longer full-time. I am attempting "retirement". I am obviously not cured of my music passion, and I will now hopefully have more time to indulge it.



LEE AND CARTER go Deep Learning

Time Series Forecasting of Mortality using Neural Networks

- Francesca Perla, Ronald Richman, Salvatore Scognamiglio, Mario Wüthrich

INTRODUCTION

Recent advances in machine learning and artificial intelligence have been propelled by the application of deep learning techniques, which is a modern approach to applying neural networks to large scale prediction tasks. Many of these advances have been in the fields of computer vision and natural language processing, for example, the accuracy of models built to classify the 14 million images in the ImageNet database has steadily increased since 2011[1]. Characteristically, the types of models used within these fields are specialised to deal with the types of data that they need to process to produce predictions. For example, when processing text data, which conveys meaning through the placement of words in a specific order, models that incorporate some sequential structures are usually used. Or, if you consider trying to predict what type of object a photograph contains, it is fair to say that the exact positioning of the object within the photo is not usually as important as whether the features of the object are clearly apparent. Thus, when designing models for this purpose, models that scan through images looking for features in any location are usually used (the technical term for this is translation invariance).

In the past several years, interest in applying deep learning to actuarial and insurance topics has grown, and there is now a body of research illustrating these applications across the actuarial disciplines of pricing, reserving, experience analysis, telematics, and, turning to the subject of this article, mortality forecasting. We believe that deep learning is a particularly promising technique for actuaries to incorporate into their work, due to the strong links between these models and the familiar technique of Generalized Linear Models (GLMs). As discussed in detail in a recent paper[2], neural networks can be seen as a generalisation of GLMs, that first process the data input through the network to create new variables, which are then used in a GLM to make predictions (this is called "representation learning"). We illustrate this in Figure 1, which shows a diagram of a deep neural network, and highlights these two components we have just mentioned: a feature "extractor" which provides new variables to a linear model. By deriving new features from the input data, deep learning models are able to solve difficult problems of model specification, thus making these techniques promising for the analysis of difficult problems within actuarial science, such as multi-population mortality forecasting, which is the topic of the rest of this article.

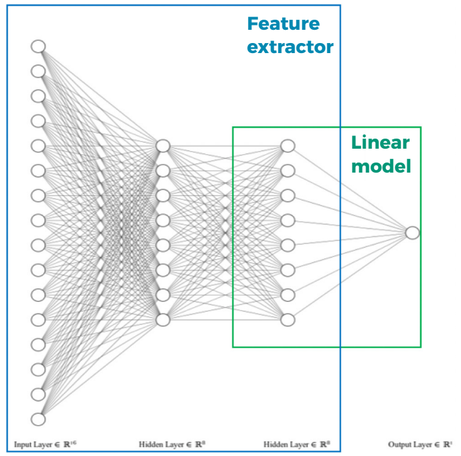


Figure 1: A diagram showing the two components of a deep neural network, within which variables are represented with circles and regression parameters with lines. The network functions in two components – a "feature extractor" derives new variables from the data input into the network, and these feed into a linear model which makes predictions.

The Lee-Carter Model

Mortality rates are basic inputs into a variety of actuarial models used in life insurance, pensions and social security schemes, and the rate at which mortality rates are expected to change over time is an assumption that these models can be very sensitive too. While mortality rates are usually set on the basis of portfolio data, a starting point for setting mortality improvement assumptions is often population data, and longer-term assumptions can be set using mortality forecasting models. One of the most famous of these models, and perhaps the most well studied, is the Lee-Carter model[3], which was proposed in 1992 for forecasting mortality rates in the United States. This model defines the force of mortality as

$$log\left(\mu_{x,t}^{p,g}\right) = \widehat{a_x^p} + \widehat{a_x^g} + b_x.\widehat{k_t}$$

which can be read as saying that the (log) force of mortality at age x in year t is the base mortality a_x at that age (in the time period considered) plus the rate of change of mortality b_x at that age, multiplied by a time-index k_t that applies to all ages under consideration. Like most mortality forecasting models, the Lee-Carter model is fit in a two-stage process. First, the parameters of the model are calibrated, and then the time index k_t is extrapolated using time series methods, to produce forecasts.

The Lee-Carter model is usually applied to forecast mortality of a single population, for example, females in the United Kingdom. However, often forecasts are needed for multiple populations at once, for example, consider the case of a large life insurer that may be interested in forecasting mortality rates across multiple products in several different countries. While the Lee-Carter model could be applied to each population/product on a standalone basis, to ensure that forecasts are consistent across populations, the period over which the model is fit needs to be chosen carefully so that the rates of change in mortality over time correctly reflect expectations about the future. Thus, a strong element of judgment is needed, which makes the Lee-Carter model less suitable for multi-population forecasting.

A different approach might be to try fit models which are designed for the case of multi-population forecasting, an example of which is the Augmented Common Factor[4] model. However, these models are usually designed on the principle that the populations to which they are applied to have similar mortality experience (which is not usually the case in life insurance portfolios) and have also been shown not to perform well on out of sample forecasting[5].

Mortality Forecasting using Deep Learning

Deep learning is well positioned to provide solutions to these types of complex problems. In the past several years a number of papers have applied deep neural networks to model and forecast mortality rates. This article focuses on the findings achieved in our recent paper[6] in which we applied specialised neural network architectures to model and forecast two mortality databases: the Human Mortality Database, containing mortality information for 41 countries, and the associated United States Mortality Database, providing lifetables for the 50 states, as well as for the District of Columbia.

In this paper, we have the goal of investigating whether, in common with the findings in the wider machine learning literature, neural networks specialised to process time series data can produce mortality forecasts that are more accurate than those produced by more general neural network architectures. We also want to develop a model that is more adaptable to changes in mortality rates, or changes in their progression, by avoiding the need to follow a two-step calibration process. To accomplish this, our model directly processes time series of mortality data with the goal of outputting new variables that can be used for forecasting. Finally, to the extent possible, we wish to preserve the form of the Lee-Carter model, due to the simplicity with which this model can be interpreted.

Convolutional Neural Networks

In this article, we focus on the convolutional neural network presented in our paper; for more detail on the recurrent neural network, we refer the reader to[6]. A convolutional neural network works by processing directly matrices of data that are input into the network. These matrices could represent images (for example, an image can be represented as matrices containing pixel intensities), or time series. We present a toy example of how this works in Figure 2, which has been excerpted from[7]. The data processing is accomplished by multiplying, or convoluting, the data matrix with a "filter", which is a smaller matrix comprised of parameters which are calibrated during the fitting of the model. The output of the same filter is calculated for the entire input data matrix, resulting in a processed matrix of data called a "feature map". By calibrating the parameters of the filter in a suitable manner, convolutional neural networks are able to derive feature maps that represent important characteristics of the input data. In the toy example of Figure 2, we have calibrated the weights to produce an edge-detector, meaning to say that when the values of the feature map are large, this indicates that a horizontal edge has been identified. This can be seen in the bottom row of the feature map, where the large values correspond to the base of the '2'.

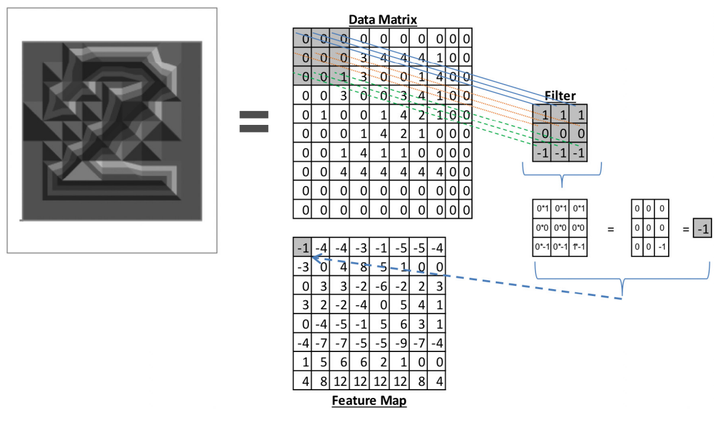


Figure 2: A toy example of a convolutional neural network. An image of a '2' is represented by pixel intensities in the data matrix. The network consists of filters, which are multiplied (or convolved) with the data matrix to produce a new matrix called a "feature map". Diagram excerpted from [7].

Defining the Model

Building on the toy example just presented, the convolutional network we apply for mortality forecasting works in a similar manner. In our example, we populate a single matrix with the observed mortality rates at ages 0-99 over ten years for each population and gender, which is presented in the top part of the diagram in Figure 3. This matrix is then processed by multiplying the observed values of mortality rates with a filter that spans across the entire age range of the matrix and extends over three years. The filters (together with some extra processing that we do not detail here) derive a feature map that feeds into the rest of the model.

We also provide the model with variables representing which country is being analysed and the gender of the population. These variables are categorical and thus, in common with most types of regression models, need to be transformed before they can enter the neural network model. Dummy coding is a popular approach to dealing with categorical variables and is the default method in the R programming language. However, when observations present a large number of categorical variables or when the variables have many different labels (such as the many countries in the Human Mortality Database), these coding schemes produce high dimensional sparse vectors, which often causes computational and calibration difficulties. Thus, we rather applied a different technique which maps categorical variables to low dimensional vectors called embeddings (see the full paper for references). In other words, each level of the category is mapped to a vector containing several new parameters. These parameters are calibrated to have proximity if the labels are similar for the regression task and are distant otherwise. The middle part of Figure 3 shows the mapping of these categorical variables to a 5-dimensional embedding layer.

Finally, we use the feature map and the embeddings directly in a generalised linear model to forecast mortality rates in the next year, in other words, no other model components process the features before they enter the GLM. This is represented as the last part of Figure 3, which shows the direct connection of the output of the network to the feature layer.

We call this model LCCONV – the Lee-Carter Convolutional model – and the code to define it using the Keras package is provided in the appendix to the paper.

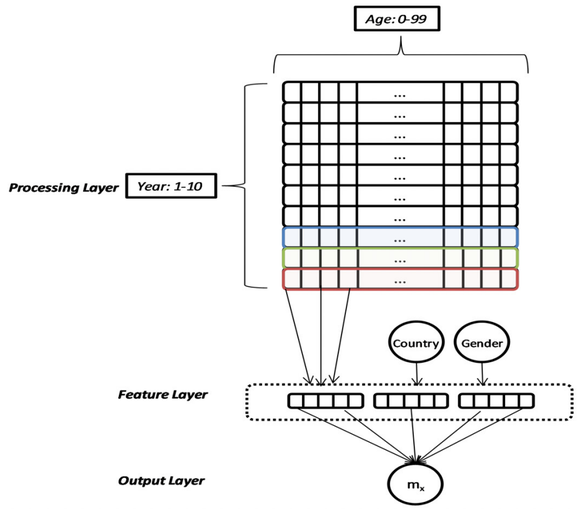


Figure 3: Diagrammatic representation of the Convolutional Neural Network mortality forecasting model LCCONV. The model is comprised of three main parts. A processing layer derives new features from matrices of mortality data. These features are combined with a vector representation of the categorical data in the feature layer. Finally, mortality predictions are made in the output layer, which is a GLM.

Results

We calibrated this model to the mortality experience in the Human Mortality Database in the years 1950-1999 and tested the out of sample forecasting performance of the model on the experience in the years 2000-2016. Our benchmarks, against which the model was tested, were the original Lee-Carter model, as well as the deep learning model from [5], which is constructed using general neural network techniques, in other words, without a processing layer geared towards time series data. Testing the LCCONV model against these two benchmarks, we found that the out of sample forecasts were more accurate than the Lee-Carter model 75 out of 76 times, and significantly outperformed the deep learning model. We show some of these results in Figure 4, which displays residuals from the models, and shows that while both deep learning models have better forecasting performance than the Lee-Carter model, the LCCONV model fits the data for males significantly better than any other model. In the paper, we also show that the LCCONV model works well on the data in the United States Mortality Database without any modifications.

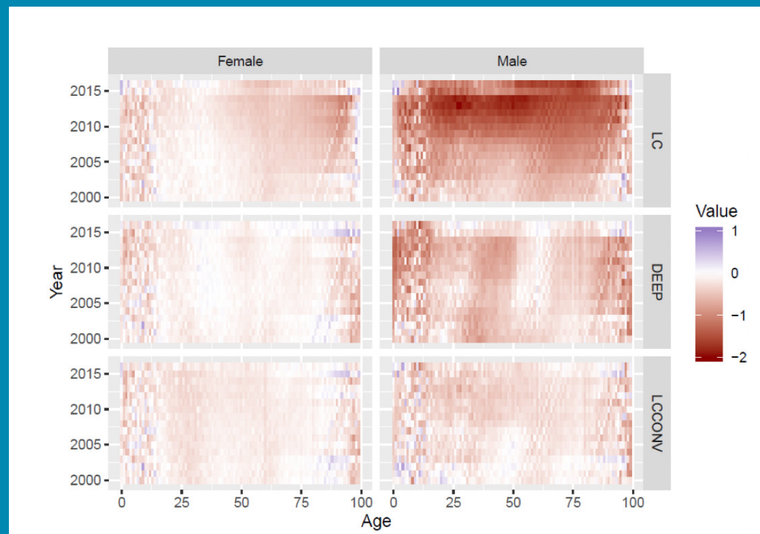


Figure 4: Out of sample residuals produced by using the Lee-Carter and two deep neural network models to forecast mortality rates for the populations in the Human Mortality Database.

Interpretation within the Lee-Carter Paradigm

In common with other machine learning models, deep learning has been criticised on occasion as being difficult to interpret. In the case of the LCCONV model presented here, we can provide an intuitive explanation of how the model works in the framework of the Lee-Carter paradigm for mortality forecasting. As mentioned above, the three sets features derived with the neural network – which are features relating to population, gender and those derived using the convolutional network – are used directly in a GLM to forecast mortality. We show this mathematically in simplified notation in the following equation:

$$log(\mu_{x,t}) = a_x + b_x.k_t,$$

which states that the neural network predicts mortality based on new variables that have been estimated from the data, represented as variables with a "hat". The first two of these $log(\mu_{x,t}^{p,g}) = \widehat{a_x^p} + \widehat{a_x^g} + b_x.\widehat{k_t}$ play the role of estimating the average mortality for the population p and gender g under consideration, respectively, and in combination are equivalent to the a_x term in the Lee-Carter model. The third of these variables is a time index derived directly from the mortality data, which is equivalent to the k_t term in the Lee-Carter model. This time index is calibrated each time new data is fed to the network, meaning to say, we have eliminated the two-stage procedure mentioned earlier, of fitting the model and then producing forecasts through extrapolation.



Thus, the seemingly complex model presented in this article can be interpreted in terms that are very familiar to actuaries working in mortality forecasting.

Conclusion

We have introduced the Lee-Carter Convolutional model in this article which uses a neural network to directly process mortality data to produce forecasts. The model has a simple interpretation within the framework of the original Lee-Carter model and produces forecasts on the Human Mortality Database with a high out of sample accuracy. The model also generalises well to another large database, indicating that for the purpose of population mortality forecasting, the model appears to be robust. Further investigation of the model could focus on how it may be applied to data from insurance portfolios, which often span a shorter time period than population data, as well as consideration of how uncertainty intervals for the forecasts might be generated.

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SNAPSHOT



MELISSA RAMSAMY-AGAPITUS

EMPLOYER	Old Mutual
CURRENT POSITION	Finance Actuary – Rest of Africa.
YEAR OF QUALIFICATION	2011
SPECIALIST AREA	Life Insurance

IN MY VIEW, THE BIGGEST CHALLENGE FACING THE ACTUARIAL SOCIETY AT PRESENT IS:

Transformation and Diversity, Limited government solutions.

WHAT IS THE LATEST BOOK YOU HAVE READ/MOVIE YOU HAVE WATCHED?

I am currently reading *Fire and Blood by George RR Martin*.

WHAT NEW HABIT OR SKILL HAVE YOU LEARNT DURING LOCKDOWN?

I have improved my baking skills and my kids say that my red velvet cake is the best.

WHAT IS YOUR IDEA OF A PERFECT HOLIDAY?

Anywhere in Namibia with my family.

WHAT IS YOUR FAVOURITE MEAL?

Lamb Breyani.

IF YOU WERE NOT AN ACTUARY, WHAT WOULD YOU HAVE BEEN?

A Party Planner/Event co-ordinator.



HENDRICO PRINSLOO

EMPLOYER	Sanlam
CURRENT POSITION	Manager in Valuations Team
YEAR OF QUALIFICATION	2018
SPECIALIST AREA	Life Insurance; Employee benefits.

IN MY VIEW, THE BIGGEST CHALLENGE FACING THE ACTUARIAL SOCIETY AT PRESENT IS:

Balancing the need to have a relevant, reliable and timely voice in a VUCA* world but still not lose our values of being considered and measured in everything we do.
* volatile, uncertain, complex and ambiguous

WHAT IS THE LATEST BOOK YOU HAVE READ/MOVIE YOU HAVE WATCHED?

I read *The art of racing in the rain*.

WHAT NEW HABIT OR SKILL HAVE YOU LEARNT DURING LOCKDOWN?

Feels like I did a masters in multitasking, other than that I learned how to make ice cream.

WHAT IS YOUR IDEA OF A PERFECT HOLIDAY?

Family time, preferably anywhere in nature.

WHAT IS YOUR FAVOURITE MEAL?

Nothing beats a good braai.

IF YOU WERE NOT AN ACTUARY, WHAT WOULD YOU HAVE BEEN?

Engineering seems like it can be fun.



HANTIE VAN HEERDEN

EMPLOYER	SNG Argen
CURRENT POSITION	Senior Actuary
YEAR OF QUALIFICATION	2000
SPECIALIST AREA	Short-term Insurance

IN MY VIEW, THE BIGGEST CHALLENGE FACING THE ACTUARIAL SOCIETY AT PRESENT IS:
How to incorporate the new developments regarding machine learning into our daily work.

WHAT IS THE LATEST BOOK YOU HAVE READ/MOVIE YOU HAVE WATCHED?
Books: Currently busy with *21 Lessons for the 21st Century by Yuval Noah Harari* and *Deon Meyer's Donker Drif*.

WHAT NEW HABIT OR SKILL HAVE YOU LEARNT DURING LOCKDOWN?
Photo editing.

WHAT IS YOUR IDEA OF A PERFECT HOLIDAY?
Camping in remote areas.

WHAT IS YOUR FAVOURITE MEAL?
Leg of lamb with baked potatoes, green beans and pumpkin fritters.

IF YOU WERE NOT AN ACTUARY, WHAT WOULD YOU HAVE BEEN?
Wildlife photographer.

FEATURE: Reflections of Actuaries as Non-Executive Directors

Over recent months, Protagion Active Career Management has been sharing the stories of a number of independent Non-Executive Directors (NEDs) as part of its career-related resources for those considering these roles. While the full series had an international focus, it included six actuaries who perform NED roles in South Africa. Abridged versions of their career journeys, reflections and suggestions are included in this South African Actuary magazine article.

The actuaries showcased here are Margaret Carey, Marjorie Ngwenya, Kirshni Totaram, Nicolaas Kruger, Karabo Morule, and Lusani Mulaudzi. Lusani, Margaret and Karabo's vignettes also appeared in the Institute and Faculty of Actuaries' monthly magazine during Q4 2020, with Karabo part of their 30th Anniversary edition. If you're performing or aspiring to NED roles, please do consider joining the IFoA's NED Member Interest Group (MIG), including its LinkedIn presence, to access international professional support.

The main role of Non-Executive Directors is to guide their organisations in a statutory capacity, using their skills and experience together with the other board members to steer the company or non-profit on behalf of all its stakeholders. Boards have a number of committees, set up to focus on specific areas needing oversight and/or attention – examples of these are mentioned by the actuaries interviewed. For brevity, our shorthand NED includes iNEDs (independent NEDs).

The "guiding rather than doing" nature of non-executive roles makes it possible to combine multiple roles together. So, they often form part of a portfolio career, where a variety of roles are done concurrently, rather than only one full-time corporate job. Portfolios can include both paid and volunteer positions: a mix of NED roles, part-time consulting, side commercial ventures, professional volunteering, community work and more … Plurality of roles is becoming increasingly common as the nature of work evolves. We trust that the experiences and reflections in the NEDs' vignettes will inspire you to reflect on your own careers and aspirations.



MARGARET CAREY

Bancassurance

Margaret Carey's career included time in the United Kingdom and South Africa. She feels she explored "all the possible actuarial roles available", trying to steer clear of moving upward in management roles to maintain a work-life balance. She has always been determined to put her children first, and now spends a meaningful amount of her time with her grandchildren.

In her role choices, Margaret welcomed any opportunity that she thought might be daunting. Lifelong learning by stretching herself … Her diverse roles covered pension valuation, life product development, group risk, experience monitoring, board reporting, alternate directorships of subsidiaries (including ongoing analysis of their results), financial reporting, relationship management and consolidation of results of insurance subsidiaries for a global financial services company, asset liability management and capital modelling, MCEV reporting, business planning, input into strategy development, and involvement in Solvency II and Solvency Assessment and Management (SAM) project teams.

This broad smorgasbord of actuarial experience gives Margaret a solid understanding of the inner workings of and risks faced by insurers. When she retired from formal employment, she was headhunted for an independent NED role for an insurance group owned by a bank (Nedbank). She accepted that position to continue her learning journey and embrace the challenge and alternative perspective it presented.

Margaret enjoys the opportunity to leverage everything she learned over her career to make a difference for the company. Her NED role requires that she keep up-to-date with "absolutely everything, so there's never a boring day or dull moment". She savours the contact with the executive and management teams, and enjoys prioritising issues and crafting how to communicate to inspire, influence and lead from behind.

She's on the board's Risk, Audit & Compliance Committees too, and also chairs the Market Conduct Committees. Using her actuarial training, she has steered implementation of new regulation which requires a comprehensive risk management system and robust governance, facilitated board signoff of policies requiring actuarial knowledge, and given input into independent reviews of processes and models. However, she says, emotional intelligence and relationship, communication and systems thinking skills together with understanding governance have probably been of more benefit as a NED i.e. the skills she developed after qualifying.

Margaret describes an effective board as a puzzle: the members and chair all need to bring a different puzzle piece to the table, each distinct but complementary. The pieces need to fit together. When the environment changes, the puzzle needs a new piece e.g. analysis of big data, digital evolution, or managing cyber risk. The next member the board looks for will need to be that new piece.

She advises those considering NED roles in future to develop unique skills to have a lot to offer: "If I look ahead, I would be getting on top of technology, behavioural and data analysis!"



MARJORIE NGWENYA

Life Insurance and Enterprise Risk Management

Marjorie Ngwenya is well known in the international actuarial community, having been president of the Institute and Faculty of Actuaries 2017/2018. A seasoned presenter, she regularly speaks to audiences around the world on topics from professional development to diversity and inclusion. Marjorie has actively developed a portfolio career over time, and is now a NED for financial services and not-for-profit organisations as well as a leadership coach and author.

Her corporate career covered diverse geographies and cultures, and she has lived in the United Kingdom, the Netherlands, Canada, Zimbabwe and South Africa. She spent much of her career as a consultant, initially advising pension schemes and later insurance companies, including working for reinsurers. After qualification, she explored roles in enterprise risk management, and in her last UK role led a team providing risk management, assurance and consulting services to the life and health insurance industry. In 2013, she took a year to complete a Masters in Leadership and Strategy at London Business School, and then moved to South Africa to become Chief Risk Officer for Old Mutual Africa. After that executive role, she joined Liberty's Group Exco, with responsibility for strategy.

Like her international executive career, Marjorie's NED positions cover a variety of countries, including for life insurers Tangerine Life in Nigeria, and Rand Mutual Assurance and FMI in South Africa. She was previously a NED for African Bank too. Her committee roles cover chairing Enterprise Risk Management and Actuarial committees. She finds her professional training very relevant, highlighting that strategy and relationship management skills are helpful too, as is the mindset that her consulting experience taught her. Marjorie is also a board member or trustee for non-profit organisations in the United Kingdom and South Africa.

In 2019, she completed a Certificate in Company Direction with the Institute of Directors, covering governance, finance, strategy and leadership. Marjorie is attracted to NED roles for their flexibility and the opportunity to offer her professional skills in a strategic way. She uses a combination of her extensive network, personal referrals and headhunters to find her NED roles.

The expectations of her as a NED are that she understand the business and external context, keep up-to-date with industry developments, build relationships with the executives of the organisation, and offer strategic input. She notes that there is a lot of reading to do. It is important that the non-executives and executives share common goals, she says, even though personal styles can differ. It is also crucial that there is a culture fit between the board member and the organisation.

Marjorie's tips for us:

- Consider the skills you are able to offer an organisation.
- Reflect on what motivates you to be a NED and acquire a full appreciation of what it involves.
- Networking is critical, including with the specific headhunters which place NEDs in the companies you are most interested in.



KIRSHNI TOTARAM

Reinsurance

Kirshni Totaram is based in Cape Town and her primary focus remains her executive career i.e. she is both an executive (at Coronation Asset Management) and a non-executive director (at Gen Re, the reinsurer). On Coronation's executive committee since 2003, she started there as a portfolio manager looking at fixed income and listed property securities in 2000. She then shifted to take executive responsibility for Coronation's institutional business division, later expanding to her current global role as Global Head of Institutional Business.

Before Coronation, Kirshni worked on policy valuation followed by time in Metropolitan's employee benefits division where she was responsible for modelling of, and consulting on, the HIV/AIDS epidemic. This involved assessment of economic and demographic impacts on population cohorts and customer segments for corporates and governments.

While Kirshni has been a trustee of an education foundation since 2016, she had not been seeking corporate NED positions when she was approached by Gen Re South Africa's CEO to join their board in a non-executive capacity. As Gen Re is fully owned by Berkshire Hathaway, this removes the conflict that would exist if she acted as a NED for a listed corporate within the South African market.

She began that NED role in 2018. This executive and non-executive mixture, with a very significant weighting to the former, leads to an interesting dynamic, requiring a "constant mindset shift". In an executive role, Kirshni explains, you're entrenched in the day-to-day frenzy of running a business. In complete contrast, a NED acts as a sounding board and governance check, requiring more distance – you don't run that company. Doing both roles has taught Kirshni some useful lessons: stepping back and reflecting "often provides an opportunity to see blindspots and improve … [This] has been invaluable in dealing with complex challenging times like we experienced during 2020."

In addition to her role on Gen Re's board, she currently chairs their Audit and Risk, and Social and Ethics Committees. A good understanding of the committee information and broader industry are important both "to ask the right questions and to assess the importance/impact of the answers given".

Although her Chartered Financial Analyst (CFA) qualification is very relevant to her executive role, it hasn't helped much for this NED role, largely because it isn't as applicable to the reinsurance industry. Her actuarial training helps with understanding risk and exposure, yet Kirshni finds that she uses more of the skills and perspectives gained over her years managing a business.

This NED role originally appealed to Kirshni's curiosity as she wanted to enhance her governance skills plus increase the breadth and scope of her industry exposure. She offers this advice:

- Consider your choice of positions carefully – interview the company as much as they interview you to get the right fit.
- Be prepared for all board and committee meetings.
- Ask lots of questions and seek to understand the company and industry well.
- Invest in learning continuously to make yourself better.



NICOLAAS KRUGER

Insurance/Financial Services, Reinsurance, Food & Beverage, and Agriculture

A seasoned director and chairman, Nicolaas Kruger's roles cover a range of sectors. For more than a decade he has served on boards and governance forums, at first in his executive capacity as CEO of Momentum and then Momentum Metropolitan Holdings (after the 2010 merger with Metropolitan). Following acquisition of specialist insurer Guardrisk in 2014, he acted as its chairman for five years. He currently serves as a NED and trustee across industries: insurance/ - financial services (Sanlam Group), reinsurance (Gen Re SA), private equity and section 12J funds (various), food and beverage (Granor Passi), agriculture (GWK, and Chair of Brenn-O-Kem) and fintech (Chair of a start-up investment business).

He began his career at Momentum and fulfilled various roles over his decades there, including as Chief Actuary, CFO, business unit CEO, and ultimately Group CEO, gaining director experience on boards of subsidiaries. After stepping down as a full-time executive, he signalled his availability as a NED to his networks. Approached to join a food and beverage company's board and become chairman of a high school governing body, he found these good opportunities "to start a new chapter of my career and to make a contribution to broader society in a new capacity". Over time, he was contacted to serve on other boards too, expanding his portfolio.

Nicolaas enjoys variety across different industries, broadening his business exposure. NED roles enable you, he says, "to contribute at a strategic level, without getting involved in the complexities of implementation". There are significant work-life balance advantages, and you also expand your networks.

He chairs overall boards and also board committees like Customer Interest, Risk, Remuneration, Social and Ethics ones. And, he's a member of others too, including audit, compliance or finance-related committees. It is important to engage regularly with company stakeholders like the CEO and chairman, he says. "A board should provide effective and ethical leadership and strategic guidance to safeguard relationships between various stakeholders of the company". It should also monitor progress with strategy execution and ensure management accountability. Fulfilling these duties requires thorough preparation for board meetings.

Reflecting warmly on his actuarial roots, Nicolaas says that "the qualification, combined with appropriate business experience, provides a solid foundation to make a meaningful contribution as a NED by applying analytical thinking, problem-solving skills, financial acumen, business insights and risk management skills". It's also valuable, he suggests, to develop the ability to think outside the box and to focus on innovation. As "the business environment has become complex and directors must ensure they have the required specialist skills and knowledge", Nicolaas recently qualified as a Chartered Director through the Institute of Directors too.

Other suggestions from Nicolaas:

- Gain experience serving on boards during your career.
- Seek exposure to seasoned directors and engage with suitably experienced mentors as they can offer invaluable guidance.
- Ensure that your personal values are aligned with the organisation's values.
- Be patient as it takes time to build a meaningful NED portfolio without conflicts of interest.



KARABO MORULE

Banking/Fintech

Karabo Morule is based in Johannesburg, and in 2020 was appointed as independent NED at digital bank TymeBank. Her career until then was spent at JP Morgan, including in London, and at Old Mutual, with her concluding role there as Managing Director of Personal Finance. Previous NED roles include company-appointed ones (such as trustee on Old Mutual's umbrella retirement funds) and an external one at a medical aid fund administrator.

A member of the Forum of Young Global Leaders in 2018, Karabo is also a NED at a South African thinktank on the role of financial services. For that role, she was approached by someone on the board she knows as they were looking for senior female executives in financial services, particularly in insurance. And, for her most recent appointment, she chatted with friends and mentors about her desire to find a NED role, and they notified her of opportunities. In general, she says, networking is very key.

Karabo feels that NED roles allow her to maintain a link to the financial services industry. She's also open to expanding her knowledge and applying her skills to other industries. She points to the regulatory requirements on NEDs to apply business knowledge and act with due skill, care and diligence. Her diversity of work experience combined with her interactions with boards at a very senior executive level support her belief that she can contribute to organisations as a NED.

A board role "requires one to maintain the values of the organisation, contribute to its strategy and long-term sustainability, and deliver value to its stakeholders". In addition to sitting on the main board, Karabo's on three subcommittees, and finds the work enjoyable "especially given the innovative and dynamic work the company is doing and its focus on innovation and financial inclusion".

Karabo highlights the control cycle and enterprise risk management as key elements of our actuarial training applicable in any business sense. And, professionalism and communication are also key.

She encourages boards to consider young executives as they can bring a different perspective and diversity of thought that can positively challenge the status quo. "The tendency for boards to want and value experience means most boards don't have any members in their thirties or forties … it is sad too, that many boards don't have sufficient gender diversity either."

Karabo's recommendations:

- Invest in a director certification or attend the introductory courses to understand your corporate governance responsibilities – attendees can often be great referrals for boards looking for new members.
- A certificate course on company law can also be insightful for your role as a NED.
- Gain different career experiences to make you a well-rounded board member as there is space for specialists and generalists on boards.
- Read the profiles of the members of a few boards to get a sense of the type of experience you might need.



LUSANI MULAUDZI

General, Life & Health Composite, and Parastatal Insurer

Lusani Mulaudzi sees his role as president of ASSA as part of his portfolio career, which also includes paid NED roles, serving on non-profit boards, consulting and lecturing. His earlier career focused on healthcare: a consultant to medical schemes and then CEO of a struggling administrator he tried to turn around. He gained insight into reporting to a board, preparing board packs and getting input from directors on the company's direction. In 2018, Lusani was headhunted to join the board of Constantia Insurance, a composite insurer. He chairs its Risk Committee.

More recently, he has joined the board of the Road Accident Fund, the parastatal insurer which provides liability cover to vehicle drivers. He chairs its Risk, Governance & Actuarial Committee. Other roles include chairmanship of a non-governmental organisation, and serving on the licensing committee for private health facilities. He's involved with the International Actuarial Association too, and strongly encourages volunteering, explaining that roles on professional subcommittees are great preparation, honing your skills to serve on boards.

Lusani's NED motivations include his interest in governance, his love for interacting with others, his desire to be exposed to different companies and how they operate, and how NED roles fit his desired lifestyle and interests. Speaking about the highs of boardroom life, Lusani enjoys figuring out what the issues are, and sifting through the information to get to their core. Listening and making decisions, including convincing others of your perspective, are also pleasurable. He recalls too, some impressive executives who "really know how to do their work, lead their business units and present, and are transparent – how an executive should be".

One of his strengths, Lusani feels, is in dealing with instability – he's able to help organisations move out of those situations. But, he cautions, that can also be the biggest risk of NED roles: you're not able to influence everything, and if the company goes bust, it can affect your reputation. You can also be found to be in the wrong by regulators i.e. personal risk. Related to this, he says understanding the professional indemnity insurance in place is important.

Reflecting on his career journey, Lusani's a strong believer in professional development: "Know what kind of person you are, and where you should position yourself. Find your place where you can blossom, and be your best".

Lusani's advice:

- Add value when in meetings: be prepared and know what you should be asking.
- Asking questions as a NED is your biggest tool. Be able to determine which are good or bad answers.
- Take opportunities to sharpen your skills, such as conferences and seminars.
- Stretch out of your comfort zone, meet new people and get out there.

CONCLUSION

Six very different directors, with varied levels of NED experience, from those in their first few roles to seasoned committee and board chairs. Some who've worked extensively in South Africa, and others who've worked internationally during their careers too. A range of domains and industries, both now as NEDs, and in their executive careers. All adding up to six personal career journeys, filled with insights and suggestions for others looking to build their own careers.

And yet, despite their different perspectives, some strong themes emerged from their reflections and recommendations for us. Common threads include:

- Attending governance courses (such as those offered by the Institute of Directors locally), both for the knowledge and to meet other attendees.
- Understanding and respecting the difference between governance and executive management i.e. being clear on the nature of a NED role.
- Knowing ourselves, what roles we'd enjoy and which boards we'd add value to.
- Building our credibility, profile and relationships, starting during our executive careers, joining professional committees, networking and/or presenting at industry events.
- Considering cultural fit and values alignment before accepting a position.
- Preparing thoroughly for board and committee meetings, and asking questions.
- Practising skills like strategic thinking, stakeholder engagement and relationship management, communication, listening, and collaboration.
- Developing ourselves through lifelong learning i.e. ongoing professional development.

Overall, while it's necessary to recognise the potential risks and perform due diligence, NED roles can be personally fulfilling and rewarding career options. For those interested in exploring how NED roles could be a part of your career, we encourage you to join NED groups or a dedicated institute/association locally. We also recommend speaking with fellow professionals who currently perform NED roles successfully (as board members, committee chairs, or board chairs) – a number of Protagion's mentors fulfil NED roles, and some of them kindly participated in this series.

Thank you to each of the six participants for sharing your experiences and wisdom with us all.

SA Actuary thanks Bradley Shearer for this article. Bradley is Executive Director of Protagion Active Career Management, an online consultancy supporting professionals to manage their careers through guidance, mentoring and coaching. He is also an actuary and a CFA charterholder.

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ACTUARIAL SOCIETY OF SOUTH AFRICA

Life at the University of Johannesburg



A story about actuarial Science at UJ by BSc Actuarial Science students *Luvhone Khwanda, Mamoshabe Rakoma, Njabulo Mudau and Rakhosa Serongwa. Luvhone, Mamoshabe* and *Njabulo* are starting their 3rd year in 2021 and *Rakhosa* is going into his 2nd year of study.



01

ACTUARIAL SCIENCE. THE FUTURE. REIMAGINED.

The University of Johannesburg (UJ) now offers a BSc Actuarial Science degree that is accredited by the Actuarial Society of South Africa (ASSA) for Part A1 subjects. UJ's BSc Actuarial Science 3-year degree was formally reintroduced in 2018 and in 2020 met all the necessary requirements for level 1 accreditation by ASSA. This means UJ now offers exemptions for Part A1 ASSA subjects.

This significant achievement was made possible by the Faculty of Science, the Department of Statistics and the department's actuaries, Mr Soshan Soobramoney and Mrs Leila Lederman. The accreditation comes at a time where UJ has been placed 75th overall in the world, out of more than 850 participating universities across 89 countries, for global societal, economic and environmental impact in the latest **Times Higher Education (THE) University Impact Rankings**.

UJ has again been ranked among the world's best universities in the global top 400 latest **https://www.usnews.com/education/best-global-universities/south-africa.** Finally, UJ rose 62 places from last year (2020)'s global ranking position in the latest **QS World University Rankings**. In the process, UJ has now broken into the top 500 position for the first time (now globally at position 439). In this ranking, not only has the University improved upon its overall score, but it is also now ranked at 3rd position in South Africa, and 4th in Africa. UJ was the only university in South Africa that climbed the rankings.

There are aspects of UJ's BSc Actuarial Science degree that are unique in the marketplace. For example, UJ actuarial science students do a full year of Computer Science in their first year. UJ also encourages its students to go above and beyond the standard actuarial syllabus through exposure to talks and lectures on a range of topics and customised leadership training for students. An example is the **Time to Think** leadership workshop offered to UJ's BSc Actuarial Science students. The programme is designed to improve students' quality of thinking and leadership skills by actively learning about how to improve the quality of relationships that they build as leaders in our modern world.

"The Future. Reimagined" is not simply a catchy phrase. The institution is taking the lead in Africa in 4th Industrial Revolution thinking, reimagining the future in all disciplines.

As the world moves forward into the 4th industrial revolution, so does UJ with "Education 4.0" - bringing 4.0 thinking and technology into the curriculum across different courses and using innovative blended-learning technologies. This results in UJ graduates being better prepared to embrace the future of business and industry as AI and 4.0 play a bigger part in the way we live and work. The future is coming; we have pre-imagined it. And 4.0 will change the world – we are on it.

02 Sibusiso Thwala,
THE FIRST UJ BSC ACTUARIAL SCIENCE GRADUATE (2019)



Sibusiso was the first UJ BSc Actuarial Science graduate. These are his words on his journey throughout his undergraduate studies.

It all started in high school when my former high school English teacher took two students (myself included) to an Actuarial Science exhibition. Learning from it that there was a low number of qualified actuaries and that few who start 1st year graduate, served as a motivation. Post matric I went to pursue a degree in BSc Biological Sciences at Wits University, with the intention of bridging to Medicine in future.

However, in my 2nd year, self-realisation kicked in. After some introspection, I convinced myself to finish the degree but I knew that my purpose was not aligned to my degree. Grateful for the process, but with the lingering unsettling feeling of not being in line with my purpose, I kept asking myself: What do I really, really, really, really want to do?

Would I say I wasted my time doing Biological Sciences? Absolutely not. That trained me for Actuarial Science. Had I not done it, I am not sure I would have had the discipline, tenacity, resilience, and motivation that the course demanded. My Actuarial Science journey was one roller coaster ride. The highs were high, and the lows were as equally low. It was challenging as promised, but discipline, dedication and hard work do bear fruit.

At some point, the journey became lonely. Towards the end of 2nd year, the thought of discontinuing became a resident in my mind. Beginning of 2nd year (2018, first class of 2nd year Actuarial Science at UJ) there were only eight of us and by 4th block there were only two people left. That was a daunting event making me uncertain of the future and leading to self-doubt. At the end I can attest that persistence is key.

Going to final year was exciting but finding out you are the only person standing a chance of being in the first class of graduates in a course can be overwhelming. If not careful, one can be consumed by the notion that everyone is watching and there is a point to prove.

It was not an easy road, it was full of bumps and challenges, but the support structure from the Statistics department at UJ, family and friends came in handy. Putting in the hours, being mentally and emotionally prepared for the journey was paramount. Self-discipline and dedication became the best tools. Lastly, loving and treating it like there was no 2nd choice left no room for quitting regardless.

In conclusion, I am nothing but "an anthill destined to become a giant anthill".



03 INTERVIEW: A RISING FEMALE IN STEM

Luvhone Khwanda

Luvhone is a final year BSc Actuarial Science student at UJ. She is the founder of an NPO called Quiver for Destiny (Q4D) and the chair of Rising Females in Science, Technology, Engineering and Mathematics (STEM), an initiative driven by Q4D. She is passionate about inspiring positive change among the youth.

Q: Tell us about your background.

I am an aspiring actuary born and bred in a small village called Tshimbupfe Tshilindi, Limpopo province. I am a third born of five children. I hold a BSc degree majoring in biochemistry and physiology. I am currently a 3rd year BSc Actuarial Science student pursuing my dream and professional goal of becoming a qualified actuary.

Q: Given that you are an aspiring actuary, how did you end up registering for a BSc in Biochemistry and Physiology?

In 2015, I registered for BSc in Mathematical Science with financial orientation. At the time, the above-mentioned degree was the closest to BSc Actuarial Science at UJ. I ended up changing qualification within two weeks of registering, due to difficulty in comprehending Computer Science. I had convinced myself that I was on the wrong path and I ended up registering for BSc in Biochemistry and Physiology hoping to branch into a medical career at a later stage.

Q: What is it that you know now that you wish you had known before changing qualification?

At some point in life, you will face challenges, but that does not mean that one should give up and change the goal. Had I known that not understanding computer science does not mean that I cannot do it, I would have given myself more time to understand the subject. I would not have changed my degree choice.

Q: How did you find Computer Science 4 years later?

I started preparing for Computer Science during December holidays knowing that I will be doing it the following year. I requested senior students to send me notes and past papers. I further reached out to a student who was doing second year in Computer Science to assist me, making it much easier for me to understand. I enjoyed Computer Science this time around and I passed both computer science modules with distinctions.

Wow! Talk about a turnaround strategy! Let us now talk about Rising Females in STEM!

Q: What is Rising Females in STEM all about?

Rising Females in STEM (or RF in STEM for short), established in 2020, is an initiative under Quiver For Destiny NPO that aims to increase the presence of women in STEM by exposing young girls to STEM careers at an early age, inspiring innovation and curiosity in a girl child, offering support to those that are already pursuing STEM careers and encouraging leadership amongst women in STEM.

Q: What were some key motivations in starting such a powerful initiative?

During my second year of study, I noticed that there were only two female students (in a class of nine students) doing third year Actuarial science at UJ in 2020. I then saw a gap that needed to be filled as this was very concerning. The under-representation of women in STEM is alarming. RF in STEM exists to address this issue. resulting in new ways of solving problems, which can only happen if we advocate for the presence of women in STEM.

Q: Now that RF in STEM is up and running, which areas of it do you want to improve on in 2021?

We are looking forward to partnering with women in STEM and STEM companies at large. We want to reach out to more people, especially those at the start of their careers (Grades 9, 10, 11 and 12). We also want to improve how people view RF in STEM, emphasising the fact that you need not be a female to advocate for the presence of women in STEM.

Q: What activities/events have you lined up for students this year?

First-year Experience as a female student in STEM. RF in STEM mentors will be sharing their first-year experience and what they could have done better given a chance to do first year all over again. This session is aimed at assisting female first years in STEM to adapt to the new environment with ease, knowing what to look out for and how to overcome common challenges faced by first years.

Career Talk with RF in STEM Showcasing of different career paths available in STEM and how one can end up in such fields. This will be done in collaboration with women in STEM careers.

THE WORLD IS CHANGING, AND THE FUTURE WORKING FORCE WILL REQUIRE INNOVATION COMING FROM A FEMALE PERSPECTIVE ...

RF in STEM Career Readiness Program

A Programme specifically for RF in STEM final-year mentees. The aim is to prepare final-year students for the world of work and empower them with knowledge and skills to ensure that they thrive in their profession. This will be done in collaboration with females already in STEM careers, recruiters and HR departments of prospective employers.

We also have the STEM entrepreneurship programme, Mentorship, STEM leadership development programme, career growth and development programme that will also be beneficial to students.

Q: How do those interested in being part of RF in STEM go about joining it?

To be part of RF in STEM Community (individuals who wants to see the presence of women in STEM), one must complete a form that can be found on our Instagram and Facebook page @Rising Females in STEM. If you are interested in being a member of RF in STEM or sponsoring any of our initiatives, please **email rising.females.in.stem@gmail.com**

04 VICTORY OVER OBSTACLES



Mamoshabe Rakoma

Mamoshabe is a final year BSc Actuarial Science student at UJ. We asked her to share with the actuarial community her educational journey and some life lessons she learnt along the way.

I was born and raised in Limpopo, Polokwane, Ga-Mamabolo. I am a third child of four to a single mother. My family has been adversely affected by poverty for as long as I can remember. It became worse after my father passed on back in 2005.

I regard myself as young, hardworking and resilient. This thought stems from the fact that I've never allowed my underprivileged background to distort the future visions I have for me and my family. For example, in my matric year I managed to bag 7 distinctions in the midst of my day-to-day calamities.

In the year 2019, I was faced with great difficulties academically because the workload was overwhelming and my personal life influenced my work ethic. I ended up failing one module and, as a result, I went into depression. This was caused by the fact that I felt like I had let my family down as they had hoped that I would change the situation at home.

After spending months in a sombre state, battling to understand why and how I had failed after making so many compromises in order to succeed, a friend advised me to seek counselling at the Centre for Psychological Services and Career Development (PsyCaD) at UJ.

During my sessions at PsyCaD, I was helped to reach the realisation that I failed not because I was incompetent, but because I had forgotten to take care of my mental and physical health. I worked very hard but not very smart. Hence the consequences.

I needed to sometimes indulge myself in other things so as to have a balanced life, instead of spending hours on my books without breaks. I also needed to make sure I got enough sleep, because lack of sleep affected how much of the work I could understand.

Roy T. Bennett writes, **"Failure is a bend in the road, not the end of the road. Learn from the failure and keep moving forward".**

I have learnt through my sessions the importance of taking good care of my well-being. It does not help to go to the extent of sacrificing your well-being to succeed in your academics. The failure was a learning curve and at my second go of the module, I had a very good

experience compared to my first attempt because I did things differently.

Beyond having good grades, this journey has also taught me that networking is as important. This meant me being open to engagements that come with meaningful lessons. I went as far as taking leadership courses in order to understand more of myself in the context of the world around me.

Therefore, to put into motion all the lessons that came with my past experiences, I have initiated an Association of South African Black Actuarial Professionals (ASABA) chapter for UJ students. The aim of the chapter is to have forums with various missions in order to empower actuarial science students at the university.

Roy T. Bennett writes, "Failure is a bend in the road, not the end of the road. Learn from the failure and keep moving forward". The road to success is not easy. I learnt to embrace my struggles and be grateful for the challenges I encounter. Failing is a part of life, but it's not your failures that will define you, it's how you choose to respond.

05 LOOKING BACK ON REMOTE LEARNING



Bongani Laurently Khambula

Bongani was a first-year student in BSc Actuarial Science at UJ in 2020. We asked him to share his transition from attending physical lecturers to remote learning.

I approached the early months of 2020 with a positive mentality and a lot of goals set for my academic and social life. The coronavirus pandemic brought major setbacks and delays to the goals I had planned. When online learning was introduced, I lost motivation and determination. As difficult as it was, I had to adjust and adapt to the new normal.

The early stages of online learning were very challenging. Online learning presented a new style of learning that needed one to adapt. Being at home during lockdown came with many distractions. I found myself spending a lot of time playing video games or being on my cell phone. Load shedding and poor Internet connectivity also brought about disadvantages.

The academic structure and support implemented by the academic staff was accommodating and it made it easy to deal with online learning. My advice to prospective actuarial students is that they should enjoy what they will be studying, stay positive in every situation, be resilient, pray and keep moving forward.

06 OUR 2020 CLASS IS READY FOR THE FUTURE

We had the privilege to sit and talk with two graduates from the 2020 class, Bradron Ngobe and Amir Karim. We asked them about how they felt about starting their careers and the tools that UJ equipped them with. They both spoke about the growth they experienced in their final year and so we asked them about one specific leadership intervention, the Time to Think leadership development workshop, and the impact it had on them.



Amir Karim

BSc Actuarial Science graduate

When asked how they would describe the training to someone who has never heard of it, Amir said that it is an interesting way to develop relationships with peers and teammates. He explained that it was really interesting to him because most introverts are quiet, and the training taught him ways to create meeting structures and space for people to fully express themselves.



Bradron Ngobe

BSc Actuarial Science graduate

Bradron described it as "the programme where we get to engage with one another and share our wellness". He explained the programme as one that teaches and improves listening skills. He said that he learnt not to interject when someone is speaking because it might be that they are still gathering their thoughts and finding themselves.

Both Amir and Bradron mentioned that the workshop helped them get an idea of the diverse perspectives of other students and ultimately to learn more about each other.

We got that it is important to take breaks to invest time in building quality relationships and interact with other people.

BOOK REVIEW: Becoming



Megan Carswell read Michelle Obama's memoir and shares her views with us.

Barack Obama's first book, *Dreams from my Father*, was released to critical acclaim and his second, *The Audacity of Hope*, became a bestseller. True to form, Michelle Obama's memoir, Becoming, is entirely different from previous Obama publications and a bestseller in its own right.

While this is definitely a book about ideas, it is very much the story of a family and ideas that change households and communities rather than principles that change a nation.

Like most memoirs, it begins with Michelle Obama's childhood on Chicago's South Side. What is unusual, is that she stresses that she and her brother were no different from other children growing up in her neighbourhood, except that her parents fought for them to have greater opportunities. It's an interesting perspective on privilege.

It also covers Michelle and Barack Obama's early relationship. It is a surprisingly candid account that captures both the highs and lows of a partnership between two very different people who happen to be public figures. Barack Obama's writing pegs him as a visionary idealist. Michelle Obama, on the other hand, is practical and methodical, but no less committed to her causes. She's open about her hesitancy to let her husband run for president and dislike for politics in general.

The White House years are covered with good humour and a good dash of humility. It was interesting to note that despite political rivalries, Michelle Obama had nothing but praise for George W Bush and his family. Hilary Clinton was singled out as providing excellent advice on choosing a school despite a bitter fight for the Democratic nomination in 2008. The ability to overlook past skirmishes makes her condemnation of Donald Trump towards the end of the book even more prescient.

This is a relatable and easy read that will appeal to those who believe that change starts at home.

ACTUARIAL SKILLS critical in assessing the risks of global climate change

The role of the actuary is to quantify and manage future risk to ensure that organisations are prepared to manage potential challenges.

Environmental and social risks and their potential effect on a company's bottom line are no exception. For example, global climate change affects life assurers because it influences mortality rates through an accompanying increase in extreme weather events, with resulting effects on vector-driven diseases, water, air and food qualities, migration and civil conflict.

Actuarial skills are therefore increasingly recognised as critical in assessing the risks of global climate change, with actuaries becoming involved in a number of critical projects. In the United States and Canada, for example, the actuarial profession has recently launched the Actuarial Climate Index to measure variability in climate. Work on the extension of this index to cover Europe is already underway.

In the UK, the Institute and Faculty of Actuaries (IFoA) has addressed the issue of claims for damages caused by contributors to climate change. The IFoA has also signed a statement by the Overseas Development Institute (ODI) urging the G20 Governments to honour their long-standing commitment to phase out fossil-fuel subsidies.

A working group of the International Actuarial Association (IAA) is currently researching the effects of global climate change on mortality. A member of this working group has further been selected as part of an expert panel advising the European Commission on policies targeting sustainable finance, specifically within the context of the Capital Markets Union.

The IAA is also involved in the Warsaw International Mechanism, tasked by the United Nations Framework Convention on Climate Change (UNFCCC) with risk-management approaches to loss and damage associated with the adverse effects of climate change, including slow-onset impacts such as sea-level rises.

Both the IAA and the IFoA have submitted responses to the Task Force on Climate-Related Financial Disclosures established by the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system.

Furthermore, the IAA is working on the regulation and pricing of carbon emissions, the effects of climate change on government budgets, and the usefulness and limitations of insurance as it relates to the effects of climate change on vulnerable populations. In light of the Paris Agreement, the IAA has already drafted a paper on the monitoring of progress towards the stabilisation of CO_2 concentration in the atmosphere.

The IAA is additionally collaborating with the United Nations Environmental Programme's Principles for Sustainable Insurance and with the Organisation for Economic Co-operation and Development on disaster recovery.

It is clear that the actuarial profession sees the need to embrace all three domains of the triple bottom line - environmental (or ecological), social and economic. In recognising this, the IAA is also extending its knowledge on ecological economics and on formulating measures that can be used for environmental, social and economic accountability by entities in both the public and private sectors.

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