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Actuaries DIGITAL

In this issue

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How to save our healthcare system - Actuaries Podcast

By Raymond Yeow

Reading time: 2 mins

Join Actuary turned Doctor, Raymond Yeow and distinguished Doctor and social venture entrepreneur, Kevin Cheng - a specialist in chronic disease management and integrated care - as they as they discuss future models of healthcare on the podcast.

This podcast unpacks the major problems and inefficiencies in healthcare delivery in Australia, from "cannibalism of state revenues" to the deployment of technology.

Dr Kevin Cheng, the founder of Osana and former adviser to McKinsey and Boston Consulting Group, discusses the impact of this on patients, especially the ageing population; probable causes, and how we can improve it.

Listen to "Future of Health - Dr. Raymond Yeow and Dr. Kevin Cheng on Osana" on Spreaker.

This conversation aims to give a taste for the type of discussions at the Future of Health Seminar (FOHS), taking place in Sydney on 15 October 2018.

Dr Kevin Cheng has worked around the world in clinical and non-clinical roles, reforming health systems and delivering improvements for patients.

As a speaker at the FOHS, Dr Kevin will focus on problems in delivering health care and what's being done about them, especially via Osana, a new social enterprise company Kevin founded to "re-imagine" the healthcare model.

> "I think Australian healthcare is not sustainable in its current configuration. If we talk to Treasury, they forecast all of the state revenues will be sunk into healthcare by 2046 so complete cannibalisation of state revenues.

At best we provide good care measured by clinical guidelines and evidence based medicine [only] 50% of the time...a reflection of why this is the case is that often our funding mechanisms orient towards activity...rather than whether we're getting a good outcome for that person" - Dr Kevin Cheng

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Changing minds - CEO Column

By Elayne Grace *(elayne.grace@actuaries.asn.au)*

Reading time: 4 mins

Elayne Grace CEO reflects on biases, the need to truly listen and the importance of creating space where new evidence can grow.

Lucinda Beaman, Factcheck Editor at The Conversation was one of the most interesting speakers at TEDX in Sydney which I attended recently.

With 'fake news' easily propelling inaccurate and misleading information to the masses via social media and online sites and forums, it's become increasingly important to be able to critically evaluate what you read and hear.

Lucinda's talk 'What does it take to change a mind?' discussed how people find it hard to change their minds about something they believe in, even when they are faced with contrary facts.

Changing our mind takes time and effort. It requires trust and respect. It demands empathy, vulnerability and most of all, courage.

If our minds are made up for good, can we truly take advantage of the knowledge that is growing exponentially?

Here is an excerpt from Lucinda's talk:

> *"Think about a person in your life you disagree with, on something that really matters to you. The kind of thing that might start an argument. Think about a disagreement, maybe about economics, immigration, climate change, politics. You're disagreeing, and you're both arguing your cases. But while you are disagreeing you are probably listening to the opportunity to refute it rather than listening to understand. We have all been guilty of this. Because in that moment what we all want is for the other person to change their mind, listen to us, nod their heads and say 'you're right'. But when was the last time you changed your mind? I'm going to hazard a guess and say most of us think that we are open minded, that we are the flexible ones."*

View the video here:
https://youtu.be/2hnfFn15fsU?rel=0

"Changing minds may not happen on the spot. Try not to win the argument. Instead try to create an environment where a seed of new evidence can grow." – Lucinda Beaman

Lucinda's ideas seem particularly relevant to Actuaries who present facts to help inform people's decisions and who also must seek information from others to help inform their opinion. We are taught to put forward information from different perspectives and different scenarios so that we get a more well-rounded and informed view of how events might eventuate. This can be from either a commercial or public policy perspective.

Top 3 tips from Lucinda Beaman:

- make sure you're listening to understand and not just for the chance to argue back;
- engage your sense of curiosity and empathy. It's one thing to know what someone believes but something else entirely to understand why they believe it. And it is in the 'why' we have the opportunity to connect; and
- when it is your chance to speak, take the time to retrace the steps you took to arrive at your conclusion. Try as hard as you possibly can to find at least one point of agreement no matter how small and then of course, share the best evidence you can.

Beyond facts, to feelings

Are people truly listening? Are we as actuaries truly listening?

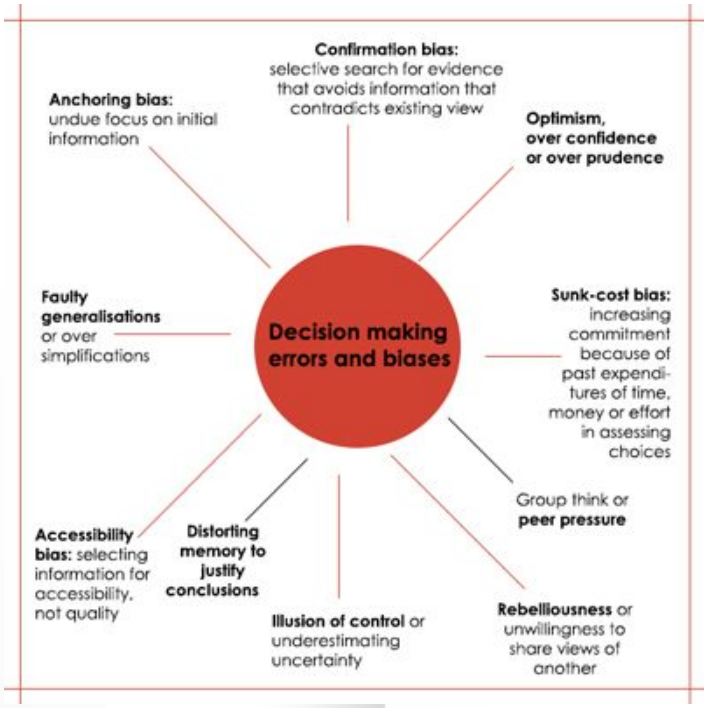
Putting facts on the table is one thing, getting people to embrace those facts is a whole new challenge. Because it's never just about the facts. Lucinda explains that those facts are tied to social issues which are usually tied to feelings. Those feelings may be tied to our sense of what is right and wrong and even the loyalty to our tribes.

Heuristics is the name given to the ingrained distortions or natural biases in the way people think - like intelligent guesses derived from experience. There are several common heuristics

we might use unconsciously, and which affect the decisions we make. Two of the more interesting ones are:

- **confirmation bias:** selective search for evidence that avoids information that contradicts existing beliefs; and the one politicians often use:
- **the illusory truth effect**: the more often we hear a statement the more likely we are to believe it is correct.

Of course, everybody tends to think they've done an independent assessment of latest information available. In some cases this is true. But how often do we acknowledge the unconscious factors we bring when we are taking on board new information?



Sharing facts to spotlight reality

The Royal Commission into Financial Services has shown there have been unseen risks in organisations. People become so used to business practices, like conflicts of interest and commission structures, that they forget to question whether they are right.

Professor Simon Longstaff of the St James Ethics centre explains here why good people do bad things. It's because they are "conditioned to be blind to the reality that is before them". This "conditioned blindness" falls into

four categories of self-deception:

1. Legalism (inability to imagine moral obligations beyond the law)
2. Tribalism (a sense that the community you are part of is the only thing that matters.)
3. Moral relativism (the excusing of unethical practices by viewing businesses as "a game" and oneself as "a role")
4. Scientism (the role that authority plays in making people blind).

It is important we see organisations for what they truly are, questioning whether practices really support the principles and values put forward. Gathering and sharing facts can put a spotlight on this reflection.

The Tedx talk considers how *a*ccepting a certain fact may require us to change our course. When that change is too challenging to our mindset, we may want to reject that fact outright.

Information that prompts a change in our belief is not just difficult to process, it could be a social risk that may lead to isolation. This can be quite scary, but we need to try to see things as they really are.

So what are the issues Actuaries should become fact finders on?

Let's think about:

- **fair treatment of customers;**
- **insurance affordability; and**
- **mental health insurance, to name a few.**

Please use the comments section below to share your thoughts and as always, feel free to get in touch with the Institute via Actuaries@actuaries.asn.au

Climate Change Blog - September 2018

By David Hudson

Reading time: 6 mins

The third instalment of our Climate Change Blog summarises news relating to physical risk – an area which is never out of the news for very long. David Hudson covers crop insurance, increasing rain storms in Australia, floods, and physical risks in banking and much more.

Welcome to the third instalment of the Climate Change Blog, an article series that aims to cover news and events related to climate change and relevant to actuaries and the industries they advise.

This series is brought to you by the Institute's Climate Change Working Group.

Look out for upcoming instalments in this series where we will be showcasing the Global Climate Action Summit and other initiatives of the United Nations, as well as the Australian Actuaries Climate Index (launching in November).

In this edition:

- What's physical risk?
- An Insurance Executive Explains Why the US Needs a Carbon Tax
- Tropics Region Expansion
- Australia Facing Increased Intense Rain Storms
- IGCC Climate Resilience Guide for Investors
- Great Barrier Reef Health Check
- IAIS Issues Paper Released
- Crop Insurance Study
- Last Week Tonight - Floods
- Physical Risks in Banking
- EBRD Report on Advancing TCFD Guidance
- Recent climate change articles by members of the CCWG

What's physical risk?

Physical risk is the risk of financial loss as a result of extreme weather events that increase in frequency, intensity and impact due to the effects of climate change. This includes sea level rise, flooding, hurricanes, droughts and wildfires.

As outlined in the Taskforce on Climate-Related Financial Disclosures, physical risk can be event-driven, including the increased severity of extreme weather events or it can take the form of chronic physical risks over the longer-term such as sea level rise or increased temperatures.

A wide range of organisations are exposed to climate-related physical risks, such as those with long-lived, fixed assets; locations or operations in climate-sensitive regions and reliance on availability of water. Physical risk scenarios generally identify extreme weather threats of moderate or higher risk before 2030 and a larger number and range of physical threats between 2030 and 2050.

The Task Force believes that all organisations exposed to climate-related risks should consider scenario analysis to help inform their strategic and financial planning processes and disclosure of internal sensitivity tests to a range of climate-related scenarios. The measurement and analysis of the financial impacts of these risks and the long duration of the problem uniquely lends itself to an Actuary's unique skills.

An Insurance Executive Explains Why the US Needs a Carbon Tax

Kicking off the latest round of news around climate risk we have an opinion piece from the former CEO of State Farm Insurance in the New York Times. In the article, Professor St Edward B. Rust Junior points to newly released figures from the Actuaries Climate Index to advocate for a Carbon economy structure. With record hurricane seasons fast becoming the norm and sea levels rising, Professor Rust warns that insuring against property losses will become more difficult and more expensive.

"As an insurance professional with over 40 years of experience, I learned quickly that when actuaries warn about risks, you listen."

Professor St Edward B. Rust Jr., Former CEO State Farm

Daily News: Waves slam the Oceana Pier and Pier House Restaurant in Atlantic Beach, North Carolina as Hurricane Florence approached the area. 15/9/2018

Tropics Region Expansion

Successful monitoring of this phenomenon could also present an opportunity to general insurers for more accurate pricing and setting of reserves into the future.

"It (the cyclone band) could be Brisbane to Sydney, Rome to London, by the end of the century,"

Professor Stephen Turton

Australia Facing Increased Intense Rain Storms

A group of scientists from Newcastle University (UK) and the University of Adelaide have published a paper in *Nature Climate Change* on the increased impact of short intense rainstorms in Australia, with implications for flash flooding in urban areas. In the article that can be found here, it states the largest increases from the expected figures are for the most extreme events.

"These changes are well above what engineers currently take into account when determining Australia's flood planning levels"

Associate Professor Seth Westra, University of Adelaide

IGCC Climate Resilience Guide for Investors

The Investors Group on Climate Change (IGCC) has released a new guide for investors on climate risk tools for managing physical risk and investing in resilience. Initially developed in a workshop in 2016, its purpose is to provide a short and handy reference for investors on the basic concepts of climate resilience and highlight some tools and resources related to its management.

Great Barrier Reef Health Check

A recent report looks at the current health of the Great Barrier Reef and the outlook into the near future. The author also looks at the changing views of many tour operators from one of very public denial to realisation and fear for their livelihood.

Photo: Dean Miller/Great Barrier Reef Legacy

"The realisation so much of the economy depends on the Reef - estimated to be worth more than $6.5 billion a year to the Queensland economy, and employing 64,000 people - can't be ignored."

Julia Leu, Mayor of Douglas Shire Queensland."

IAIS Issues Paper Released

The International Association of Insurance Supervisors, which counts APRA as one of its members, and the Sustainability Insurance Forum, issues their final issues paper on climate change risks to the insurance sector. The paper, which can be found here, was written to raise awareness for insurers and supervisors of the challenges presented by climate change, including current and future supervisory approaches for addressing these risks.

Three key external developments driving APRA's internal action were:

- The launch of the FSB Task Force on Climate-related Financial Disclosures
- The Paris Agreement on Climate Change
- Australian legal opinion on the legal duty of corporate Board with respect to climate change

Crop Insurance Study

A recent study from the United States researches the effect crop insurance has on the habits of farmer's crop choices. It is part of the 2018 Farm Bill which is currently being finalised in Congress. The article, which can be found here, presents the case that in its current form, crop insurance is incentivising farmers to use too much water and select nutrient intensive crops. The moral hazard problem of farmers not being prepared against extreme weather is also analysed.

"Modifying crop insurance to reduce incentives for unsustainable farming practices could be an effective way to ensure the resilience of our future agricultural system."

Don Fullerton, Gutsgell Professor of Finance, University of Illinois

Last Week Tonight - Floods

With the recent cost of Hurricane Florence still being calculated, here is a timely reminder of the importance of good product design. John Oliver's episode on the federal system for financing

flood recovery in the United States describes some unintended consequences of providing discounted, government-funded insurance to properties at high risk of flood.

Physical Risks in Banking

Sixteen leading banks convened by the UN Environment Finance Initiative (UNEP FI) and supported by climate risk advisory firm Acclimatise, have released new methodologies that aim to help the banking industry to understand and manage the physical risks and opportunities of climate change in their loan portfolios.

Using the methodologies, banks can begin to assess physical climate risks in their loan portfolios, evaluating the impacts on key credit risk metrics – Probability of Default (PD) and Loan-to-Value (LTV) ratios. The forward-looking assessments offer longer-term insights that go beyond the usual stress-testing horizon of 2-3 years.

Case studies from leading banks who piloted the methodologies are provided in the report.

EBRD Report on Advancing TCFD Guidance

Also in banking, the European Bank for Reconstruction and Development's Report on Advancing TCFD guidance on physical climate risks and opportunities has been released. This report builds on and explores in more detail the recommendations of the Task Force on Climate-related Financial Disclosures. The recommendations have reiterated a growing concern of business leaders and investors over the physical impacts of climate change on the economy and financial markets.

Would you like to know more?

Recent climate change articles published by members of the Climate Change Working Group:

- *Climate Change Blog – August 2018 by David Hudson* *https://www.actuaries.digital/2018/08/29/climate-change-blog-august-2018/*
- *Climate Change Blog – July 2018 by Evelyn Yong* *https://www.actuaries.digital/2018/07/20/climate-change-blog-july-2018/*
- *Climate Change Disclosure – Financial Institutions Feel the Heat by Sharanjit Paddam and Stephanie Wong* *https://actuaries.asn.au/Library/Miscellaneous/2017/TheDialogue3ClimateRiskWEB.pdf*
- *Climate Related Financial Disclosures: The Way Forward? by Wayne Kenafacke.* *https://www.actuaries.digital/2017/03/31/climate-related-financial-disclosures-the-way-forward/*
- *An Overview of the Actuaries Climate Index by David Hudson* *https://www.actuaries.digital/2017/02/09/an-overview-of-the-actuaries-climate-index/*
- *Climate Risk Management for Financial Institutions by Sharanjit Paddam, Stephanie Wong and Alison Drill* *https://www.actuaries.digital/2017/01/31/climate-risk-management-for-financial-institutions/*
- *TCFD Webinar: Climate Leadership – How to Support the TCFD* *https://www.fsb-tcfd.org/event/webinar-climate-leadership-support-tcfd/#*

How can the government better use data? - The Dialogue podcast

By Hugh Miller and Vanessa Beenders

Reading time: 2 mins

The Institute's latest Dialogue thought leadership paper explores where better outcomes can be delivered and significant savings can be made in social welfare through better data analytics.

Vanessa Beenders from the HQ Public Policy team interviews Hugh Miller, Principal Actuary at Taylor Fry, on his new Dialogue thought leadership paper titled 'People, projections and payments: A look at modern government service delivery'.

The paper was published today. See the Paper and view the Media Release.

Listen to "The Dialogue - Modern Government Service Delivery" on Spreaker.

Listen on Apple Podcasts

Listen on CastBox

View the video here:View the video here:
https://youtu.be/khKmITOeJU0

Better data analytics in government service delivery can lead to:

- improved outcomes for individuals and families in many fields. For example, better data linking could improve health outcomes (by linking treatment administered with long term health result) and employment (by linking people's attributes to long term employment secured).
- private investment being more willing to supplement government support of social services through 'social impact' investment, in fields such as housing and justice, providing a win-win solution for all.

The financial case for improving data analytics in government service delivery is compelling.

For each vulnerable individual in society, services spending across welfare, housing, health care, justice and child protection can easily amount to $500,000 to $1 million over a lifetime.

In aggregate, these services represent roughly a fifth of annual Gross Domestic Product, over $300 billion a year, and the Government has valued future welfare system costs at $4.7 trillion for the current population.

In the discussion, questions for Hugh include:

- What different areas of service delivery are included in your paper?
- How are actuaries helping governments to improve the service delivered and outcomes experienced by people?
- What is the 'investment approach' to improving services?
- How does this differ to cost-benefit analysis as a tool?
- How does Australia compare with NZ in the use of data analytics to improve public service delivery?
- What are the barriers that prevent it from happening or from occurring quickly in Australia?

Hugh's Dialogue paper is an extension of his winning entry in the Public Policy Essay Competition. Read his essay here and watch him discuss his essay in the below video.

Subscribe to Actuaries Institute Podcasts, wherever you get your podcasts, and head to the 'Public Policy and Media'' section of the website for more latest research from actuaries

The Critical Line - Volume 24

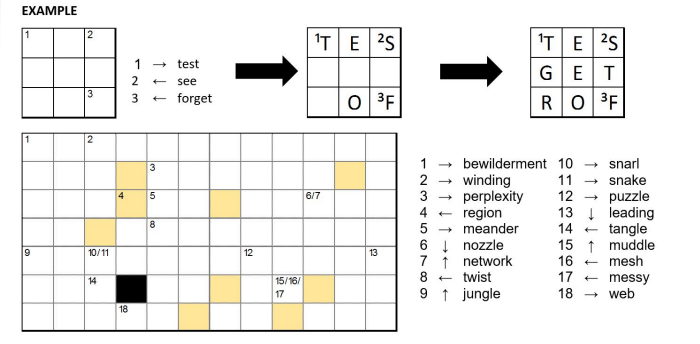
By Jevon Fulbrook

Reading time: 2 mins

Jevon serves up a new type of wordy puzzle for you to unscramble while Dan sifts through 11 responses to find our Volume 23 winner!

Your task is to fit all the given words into the grid. Each word starts in the square with the corresponding number, the second letter being in the given direction. The remaining letters in the words may follow in any direction, left, right, up or down, one letter per square. The black cell is blank. The yellow cells unscrambled will deliver the final solution.

Note that letters in the grid may be shared by multiple entries, though no letter may be reused within a single entry.



For your chance to win a $50 book voucher, send your solutions to ActuariesMag@actuaries.asn.au

Critical Line Volume 23 Answer – by Dan Mayoh (dan@fintega.com)

11 people sent in responses to this problem, of which nine got the problem essentially correct. A few different methods were used, which is what I like to see.

Congratulations to Kelvin Duong, Jackie Lok, Benjamin Howe, Mike Fowlds, Hemant Rupani, Andrew Parker, Weixuan Li, Edward Peyton and Tim Yip! (And well done to the five of you who also sent in a correct answer to the second part of the question.)

However only four of those nine gave the answer in exact fraction form as requested, and only two of those four gave the answer expressed to the relevant fraction of a second as requested, as opposed to fraction of a minute. And so, by toss of a coin, the winner of the book voucher is **Benjamin Howe!** (Bad luck Andrew Parker who lost the coin toss.)

Solution:

The answer to part A is 12:04:02 and 174/1953 seconds (which equates to 4.034818228 turns rolling dice).

The answer to part B is 12:06:32 and 199708/364819 seconds (which equates to 6.542456944 turns rolling dice).

For a discussion on solving the problem (well, the equivalent problem using apple trees that I adapted to using dice) using Markov chains, see

- http://allmathsconsidered.com/2018/01/16/a-response-to-the-tricky-apple-tree-probability-problem/

For a discussion on solving the problem using (i) a tidy approach that can be done entirely by hand, and (ii) a recursive approach that can also be done by hand, see

- https://mindyourdecisions.com/blog/2018/01/14/tricky-apple-tree-probability-problem-from-the-online-math-olympiad/

The above 'tidy' approach can also be found at solution 16 here, which is where the problem originally came from:

- http://internetolympiad.org/archive/OMOFall16/OMOFall16Solns.pdf

Leading the profession in general insurance

By Tim Clark and Kitty Ho

Reading time: 2 mins

Tackling the big issues in the general insurance industry, representing actuaries and motivating a group of volunteers has been the remit of IAG's Tim Clark for the last five years.

After five years as the Convener of the Institute's General Insurance Practice Committee (GIPC), Tim Clark has stepped down due to work commitments. In this podcast, Tim speaks with GIPC member Kitty Ho about memorable moments over the last five years, including debates over general insurance cover of mental health conditions and of flood damage following Cyclone Yasi.

Tim talks about the challenge for actuaries to uphold their reputation and, given the 2014 Financial Services Inquiry (FSI) and current Royal Commission, touts the unique idea of having a *CRO for Australia*

"I quite like that idea still... but I don't think I'd ever want to do it for Australia though," he says.

Listen to "Leading the profession in General Insurance - An Interview with Tim Clark" on Spreaker.

Listen on Apple Podcasts

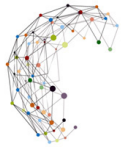
Listen on CastBox

"we are the original data scientists but there are so many tools and techniques that we need to change to maintain relevance... we've got to keep pushing [our reputation] hard" said Tim. "I feel proud representing the profession to APRA and other stakeholders because they really respect actuaries."

Commenting on his departure, Elayne Grace CEO said:

"Tim is a great lateral thinker who brings positive energy to the brainstorming of issues facing our profession and industry. He encourages us all to be able to articulate the clear value differentiator of Actuaries. Tim has been great to work with and I would like to thank him for the significant contribution and forward-looking approach he has provided as Convenor of the GIPC."

Come join in the discussion at GIS, and help drive the role of actuaries in delivering change to the industry.



General Insurance Seminar
Transform the Future
12-13 November 2018 • Sofitel, Sydney

What's the Mental Health problem in Travel Insurance?

By Bill Konstantinidis and Michael Storozhev

Reading time: 4 mins

Mental illness has historically been painted with negative stigma by the community. Over time, as we understood more about mental health, greater recognition to accept mental illnesses as something to be managed, rather than shunned, grew. As more high profile people continue to open up about their personal challenges with mental health, there is a strong desire in the community to assist people with mental illness.

The focus on managing mental health permeates many parts of society. This has caused the insurance profession to become more proactive in addressing it, rather than having society and government impose regulation on insurance due to a failure to respond. In a recent Insights session, we spoke of these challenges for the insurance sector, focusing on the life and travel insurance markets. For numerous reasons, coverage for mental health conditions has been excluded from insurance policies. In travel insurance, such exclusions have led to many people:·

- finding themselves not covered for things they would expect to be included in their policy;·
- significantly out of pocket; and·
- under additional stress because of the claims process impacting their mental health further.

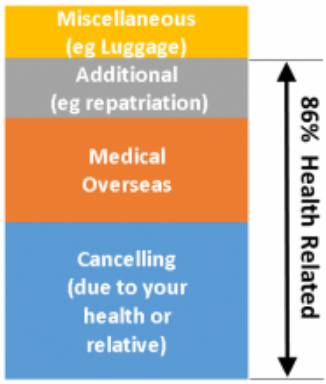
These problems bubbled away in the background for many years until the landmark Ingram case brought them to a head in 2015. This case was seized by consumer lobby groups and human rights bodies to highlight insurers as heartless and out of touch with society norms. This focus has led the industry to finally challenge its stance on mental health.

What does Travel Insurance Cover?

Travel insurance provides cover for:

- cancellation of your trip before travel, due to illness or injury;
- overseas medical treatment and hospital care should you injure yourself or become sick while travelling;
- repatriation of the injured, the sick and the dead; and
- luggage and flight delays

The health of the travellers or their relatives is the primary risk factor in travel insurance, with health-related claims making up 86% of claim costs. Hence, mental health is an important issue.



The Mental Health Problem

Until 2017, many customers with mental health issues looking for travel insurance encountered exclusions that resulted in:

A. Lack of Coverage for the case where a mental health incident occurs for the first time either before travel or while on travel. ("First Onset")
B. Lack of Coverage for existing known mental health conditions ("Existing Condition")

As a result people travelled uninsured, and in many cases unknowingly so.

Examples of Mental Health in Travel Insurance

Claims arise for a number of reasons. These three real life examples demonstrate the pressing customer need for better coverage of mental health issues.

Mental health incident happening overseas

A 24 year old on a five week holiday in beautiful Croatia. He experienced a psychotic episode. He thought he had superpowers. As his condition deteriorated he was hospitalised. He stayed in hospital for three weeks. The hospital costs come to over $17,000. How does the policy respond? Declined. The standard exclusion applies. As it is a claim as a result of a mental disorder.

Mental health of a relative not travelling with you

A couple in their 50's book a cruise holiday in Europe. Just before they intend to leave their 16 year old son is diagnosed with depression and suicidal thoughts. The medical advice is they need to stay for the wellbeing of their son. They cancel their trip and lose $30,000 in prepaid travel costs. How does the policy respond? Declined. If this was for any other illness, injury or sickness this would be covered.

Cancellation before travel due to the mental health of the traveller (Landmark Ingram Case)

Ella Ingram planned a Year 12 trip to New York City. After booking she was diagnosed with severe depression. She was prescribed medication and subsequently admitted to hospital in a suicidal state. She was in hospital for two weeks. On the advice of her psychiatrist she cancelled her trip losing $4,300 in air tickets. How did the policy respond? Declined (at least initially).

The Insurance Problem?

A number of reasons have been given for not addressing the mental health coverage issue.

- Lack of relevant, classified and analysed data in the travel insurance context to price the benefit.
- Travel can exacerbate existing or undiagnosed mental health conditions. Factors such as navigating the unfamiliar, physical discomfort on planes or new time zones, can all trigger a mental health episode.
- Diagnosing mental health relies on self-reporting of symptoms. It is difficult to validate directly – the "invisible illness" problem. This is particularly relevant in the context of determining whether mental health or mere disinclination to travel is the cause. So, there was a potential exposure to a lot of claims for cancellation pre-trip which could not be sufficiently validated.
- Mental health claims can require long periods of high-level care or hospitalisation with difficulty in determining likely timing for recovery to allow transportation home. Overseas hospital costs are significant, resulting in expensive claims.
- An incorrect assumption that overseas data was irrelevant to understand the risk in Australia.

Movement in the Market

Not withstanding the challenges, a number of major players in the travel insurance market started to cover mental health conditions in 2017, leading to an acceptance in the market that mental health risks are acceptable.

Our own experience suggested that mental health was not as big an underwriting problem as the market thought. The number of claims were well below expected and those with existing mental health conditions were relatively low risk.

We believe that more needs to be done by the industry to continue removing barriers to mental health cover and care within insurance. We will continue to explore this in our presentation at the upcoming General Insurance Seminar in November where we will present some of our hypothesis around the low claim rates, including investigations into the correlations between travel, financial means, and social economic status of Australians dealing with mental health conditions.

Come join in the discussion at GIS, and help drive the role of actuaries to deliver change to the industry.

General Insurance Seminar
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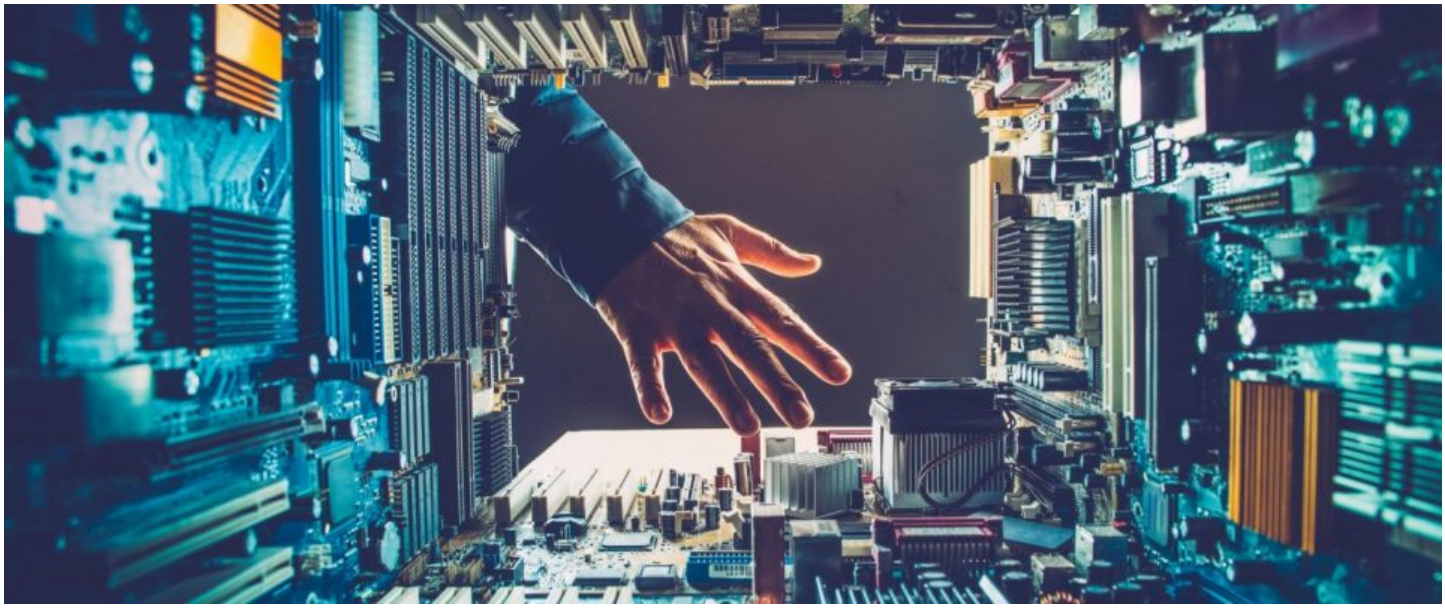


When analytics projects go wrong - Normal Deviance

By Hugh Miller

Reading time: 3 mins

Many organisations have seen big-ticket analytics projects turn into a morass of expense, confusion and lacklustre results. While some mistakes are unavoidable, there are ways to make the best of such experiences.

When studying at university, I was fortunate enough to have lunch with a senior academic from one of Australia's largest medical research institutions. I impertinently asked him why so many of the big-ticket research projects (cancer, brain science, genetics etc) that attracted significant funding often underdelivered on their promised findings. He gave my question more time than it deserved. He believed that there was an element of a sales cycle in big medical research projects; to secure funding and high-quality students you had to aim big, knowing that progress is likely more modest. But it is vital that you have continuity so that over time you can incrementally build on progress towards great things.

This sales cycle exists for big analytics projects too; I've seen and heard about many cases where a big bold vision to transform an organisation's use of data has woefully underdelivered. In some cases the results are so bad that a project is abandoned altogether. What are we to make of this? Is there a better way?

Here are some thoughts.

- **Do not ignore incrementalism:** There is nothing wrong with a big bold vision, particularly if it's the best way to gain stakeholder buy-in. However, the reality is that most organisations see incremental improvements in their capability and results over time. If you're evaluating a potential new project, try to ensure that it builds on what you've already got and that, at worst, it will still deliver some useful incremental progress for next time. This means injecting a dose of realism into the vision.
- **Your hard problems will often remain hard problems:** Sometimes part of a justification for a big analytics project is to solve a deficiency in the current setup. For example, the ability to better manage customers with complex product holdings. In many cases, if these were easy problems to solve then they would already have been solved. Radically changing an IT system or an analytics solution might just repackage the issue into a different form.
- **Use consultants effectively:** Consultants are a fixture of the analytics landscape and their advice is often sought for big change projects (disclosure: I am one!). However, they will usually not have the same end-to-end view of the business as internal teams, and they will not have to pick up the pieces if things go wrong. Over-reliance on consultants or lack of knowledge transfer in a project creates risk for an organisation.
- **Laying good groundwork is important:** Much activity these days is done under the umbrella of 'agile' management and minimum viable products. Such approaches aim to rush to a solution and fill in the details later. Agile management has been hugely valuable in breaking down previously monolithic projects with giant Gantt charts. There is a risk of going too far; sometimes there is value in laying the foundations (good data flows, scalable infrastructure etc) rather than racing ahead to the final product. While less sexy, it is possible to sell such groundwork if it aligns well with longer-term analytics ambitions.
- **When a project goes wrong, look for the value:** Even if a project ends up in the scrapheap, there will usually be progress that can be scavenged. Some of this might be higher-level learnings (e.g. discovering the weakness of an analytics platform that guides future decisions). Others could be lower level, like new code or models that solve a smaller problem that can be re-purposed. While sifting through a failed project can be painful, a blanket deletion can be worse.

Not every analytics project will be a success, just like not all medical research yields spectacular cures. But both have the virtue that there is always a new opportunity, particularly when you appropriately learn from the past.

Proud to be me - Q&A with Actuary at IAG, Michael Liu

By Suzanne Patten and Michael Liu

Reading time: 3 mins

Suzanne Patten, Deputy Convenor of the Diversity and Inclusion Working Group (DIWG) interviews Michael Liu, Senior Manager in the IAG Predictive Modelling team, who has worked across various pricing and reserving roles as an Actuary.

Michael migrated to Sydney at nine years old from China and has become a committed father raising his daughter to be proud of her heritage. Michael has also been involved with IAG's diversity and inclusion initiatives particularly focusing on cultural diversity.

1. Can you share why diversity and inclusion initiatives are important to you?

My first opportunity to really look into diversity and inclusion was about five years ago when I was given the task to consider diversity in my business division. The information I gathered had empowered me to understand myself and others' perspective of me. I now feel that I am in a strong position to encourage others to do the same.

2. In your own research on diversity, what did you find that show how cultural backgrounds can impact the workplace?

My heritage gave me a very strong sense of hierarchy. Consequently, it is natural for me to just listen and refrain from questioning and avoid potential conflict. Those feelings and reactions are so ingrained, that often I am not even aware that I am doing it.

In my performance reviews, I started to get feedback from my managers that I need to show more 'presence'. That confused me. I was thinking in my head that I always arrive on time and listened. No twiddling of thumbs or playing with my phone. Isn't that what I am supposed to do?

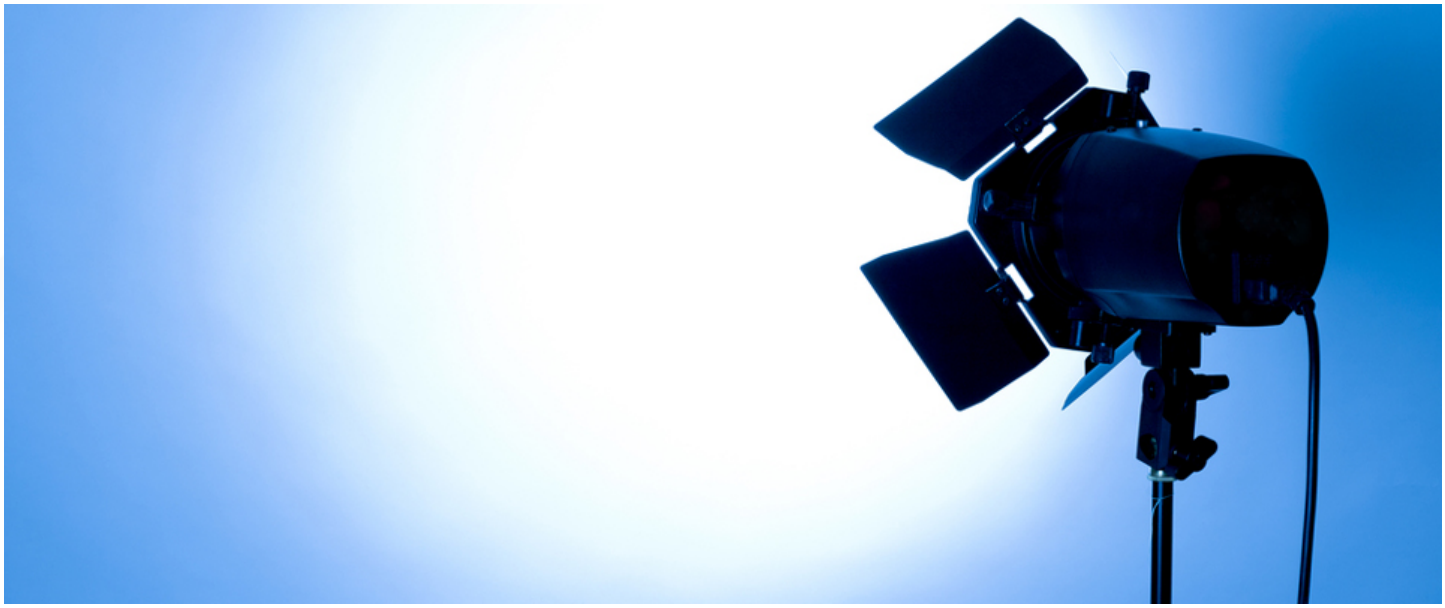
One day, I gathered enough courage and asked my manager the question "What do you mean by 'presence'?". Since then, I have tried to talk and ask as many questions as I possibly can. I kept it up until I got feedback that I should listen!

3. Using your own experience, what advice would you give to those starting out their Actuarial career who may have a similar background to you?

- Be brave and find out how others feel – I started out my career very wary of asking how others feel about me because I am not sure how to handle any unpleasant surprises. Instead I just assumed everyone saw me as I saw myself, beautifully of course! However, I am missing out on the information that enables to be truly what I want to be;
- Be prepared to share your feelings – I often found it easier to go with the flow, probably from a healthy mix of confrontation avoidance and laziness. It's only much later in my career that I realised as Actuaries we are advisors. That means that being true to my feelings and having the ability to express those are pivotal for my sanity;
- Believe in the best intentions of others and that you can do something about it – That feeling of interrogation is a common occupational hazard. I choose to believe the intent is always to understand my point of view, hence it is my duty to make every effort to share my views clearly with my audience.

4. What has been one of the memorable moments with your family that have made you realise how important it is for us to encourage a "Proud to be me" approach to Diversity and inclusion?

I feel proud and privileged to have lived and brought up in mixed Australian and Chinese cultures. I value the Australian landscape, honesty and dedication; and I love my Chinese traditional customs and food.



Under the Spotlight - Daniel Cooper

By Daniel Cooper

Reading time: 4 mins

Before he goes on stage to be under the real spotlight as a panellist at this year's General Insurance Seminar, Daniel Cooper, Head of Consulting & Research at Lorica Health, tell us all about himself here – his career, his achievements his passions, his life in Asia and a tip or two for younger actuaries…

Summarise yourself in one sentence… A curious and pragmatic actuary, who enjoys solving problems in social and healthcare fields

My interesting/quirky hobbies… People will say that waking up at 4.30am to work out in the rain is quirky but it works for me

My favourite energetic pursuit… Staying fit, getting outdoors and rough housing with my son

What gets my goat… People who show a lack of respect and basic curiosity. Also, over-sized ego's that get in the way of getting things done.

I'd like to be brave enough to… take a 6 month break from work to be sole caregiver to my children

I am most passionate about… my family.

In my life I'm planning to change… take on less projects, but do them better.

Not many people know this but I… was once the NSW U17 Gridiron team starting quarterback

Where I studied to become an actuary and qualifications obtained… Macquarie University. I did a double degree with Applied Finance. I have since completed a Graduate Diploma in Psychology.

Short description of career… I started with PwC actuarial in 2006 where I had my foundational training on how to be "an actuary". I was exposed to the Healthcare, disability and accident compensation sectors which opened my eyes to the fact that actuaries could make a difference in people's lives. In 2013 I moved to Hong Kong and had the privilege of assisting the Hong Kong Government with a wholesale review of their PHI industry. I also took my first plunge into the corporate world via a business role with MetLife Asia. I often joke that this was my "paid MBA" as I was able to learn from seasoned professionals yet also contribute to areas such as M&A, corporate strategy, product design/marketing, new markets, finance, and much more across 7 different Asian countries (everything from Bangladesh to Australia!). I returned to Australia in 2016 and have worked with a small but growing Healthcare software company named Lorica Health. This has allowed me to enter the diverse and murky worlds of PHI and software engineers….. and career-wise I've been lucky enough to fill a diverse range of roles from straight consultant to product manager to looking after finance and more recently, R&D!

What I find most interesting about my current role… Every day brings a new challenge and often a new role to play. A small company is great because I feel like I can make a real impact on our success (or failure).

Actuarial capabilities I use in my current job… Context-specific problem solving skills, in particular the ability smell a rat (or a mis-used assumption) from other analytical professionals.

My role's greatest challenges… Prioritising scarce resources and bridging the gap between the specific needs of software development with the ever-changing mosaic that is healthcare.

One of the most creative applications of actuarial capabilities that I have used in my career… applying simple matrix models to the way in which people suffering Traumatic Brain Injury experience functional improvements over time. It was fairly simple modelling at the time but the doctors in this area had never looked at the data in this way.

My proudest career achievement to date is… Being part of Lorica Health's growth from 20 to 60+ staff and international expansion.

10 years from now, I will be … hopefully doing the same things – working in an area I believe in, spending time with my family and constantly learning about the world. However, maybe in a new country, and a new industry?

Who has been the biggest influence on my career (and why)… I've been incredibly lucky to work for three unique and extremely successful leaders in my career. They've all in their own ways taught me the value of working from a place of passion, the value of ruthless prioritisation and ultimately how important it is to believe in myself.

Why I'm proud to be an actuary… The unique and valuable perspective which our profession has evolved over time. It's also a great ice breaker when meeting new people in a business context.

The most valuable skill an actuary can possess is… an open mind and appreciation of other points of view; there's still a lot that we don't know nor always appreciate as a profession.

Skills actuaries should enhance to become more effective in my field of work… data science and software engineering techniques, healthcare domain knowledge (where simple and clear often trump elaborate), political realities

My best advice for younger actuaries… go and work overseas before life gets in the way, you won't regret it. In general, I've always found that putting myself in difficult situations is the best way to develop as a professional.

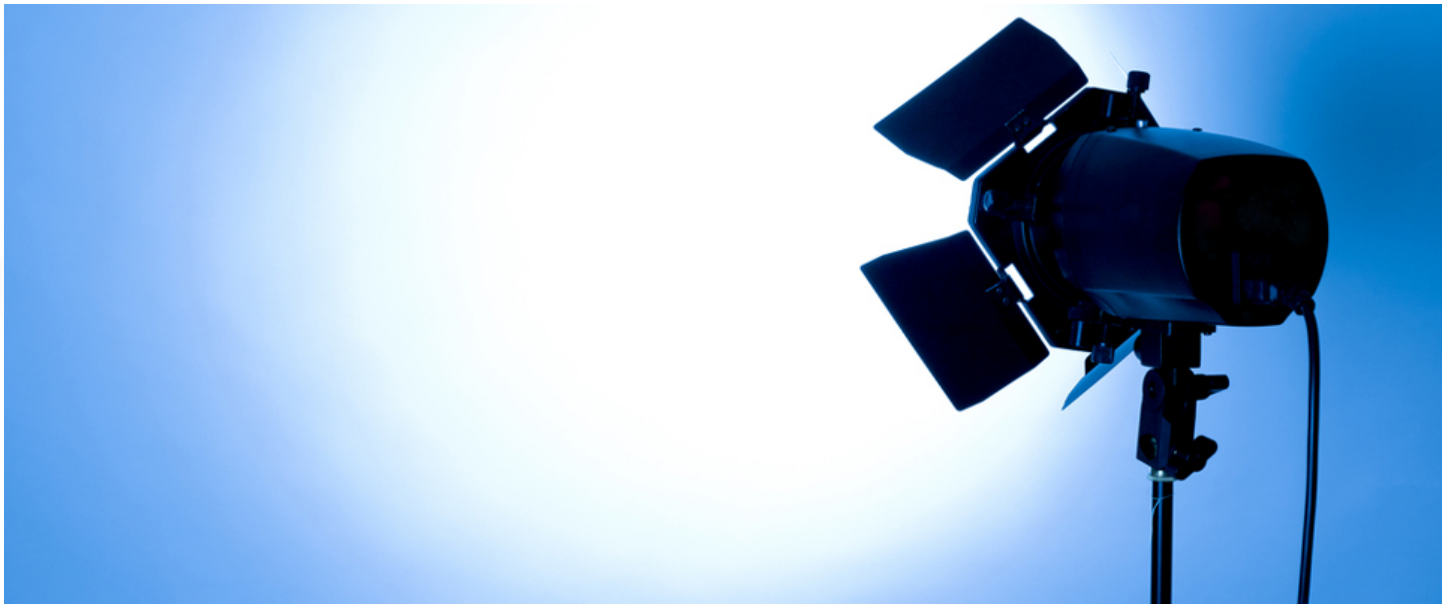
My vision on Asia… It's hard to have a view on Asia that has not already been stated. In general, I believe that many are underestimating the potential and innovation of the region – not just it's businesses but crucially it's people. The talent and drive I saw in fresh graduates from Asia is unmatched even in Australia.

What advice I would give actuaries planning on working in Asia… Keep an open mind and go for more than 2 years. It takes one year to learn how to live overseas, another year to properly assimilate into the work environment, and only then can you really have fun and contribute fully.

When I retire, my legacy will be… hopefully many net positive relationships and a professional contribution that lasts beyond my retirement.

You'll hear more from Daniel at this year's General Insurance Seminar as he shares his views on "Data Led-Innovations in the Insurance Value Chain" plenary. Don't forget to register. Early bird closes end of September

General Insurance Seminar
Transform the Future
12-13 November 2018 • Sofitel, Sydney



Under the Spotlight - Annette King (Councillor)

By Annette King

Reading time: 5 mins

Councillor Annette King describes herself as a leader, future-focussed, client and people-centred, change agent, energetic and authentic. Read about how all these qualities are reflected in her professional and personal journey as an actuary.

My interesting/quirky hobbies... Travel, I love my exercise, I'm currently focussed on doing achieving the gymnastics/ballet "splits" again

My favourite energetic pursuit... Walking/hiking (I recently did a 35km charity walk), pilates, gym – I exercise a lot!

What gets my goat... Complainers: things do go wrong and/or can be improved – stand up and do something constructive and positive to make things better

I'd like to be brave enough to... Get a dog. My kids have lived their whole lives in apartments in Singapore and HK, and they are so keen to get a dog now we are in Australia with a house and back garden! But I know who will end up caring for our pet…

In my life I'm planning to change... My house. I lived overseas for 14 years, left with a baby in my arms and now have moved back to the same house with 3 big kids – so we need more room.

Not many people know this but... My family emigrated to Australia in the early 1800s via China, so my extended family's favourite game that all the Kings play when we get together is Mahjong! When I moved to Asia, this was a great point of connection.

I became an actuary because... It sounded like a good career, bringing my love of maths into the business world … and it also helped a lot that I had a scholarship with Colonial!

Where I studied to become an actuary and qualifications obtained... Macquarie Uni BEc, FIAA, FAICD

I am most passionate about… Making a difference. Improving the quality of lives. Making things fairer.

What I find most interesting about my current role... I have a portfolio career. It mostly focusses on designing and building future business models and everything that encompasses: including the client-centric proposition, profitability, the impact on the future of working, use of technology, crossing industry boundaries and cross-border opportunities. I live in the innovation and strategy space, and I love it!

My role's greatest challenges... In my non-exec director roles, the governance challenges vary; but as a Director I am always conscious to ask questions or make comments in the right way, that gets to the heart of the issue, supporting management and yet challenging issues of concern. It's not easy and I learn every day. In my startup business, the current focus is to launch and rapidly expand the client base.

My proudest career achievement to date is... I am lucky to have many proud moments! I am very proud of my business results in all of my roles. But I am equally proud of the staff and ex-staff who push themselves and achieve more than they dreamed. And I have done some very interesting things for the community, such as creating a very large sponsorship program for the Angkor Wat half marathon, which 10,000 people from 80 countries run in … and whose charity is a hospital in Siem Reap.

10 years from now I will be... Mentoring young business leaders with insights about the journey of change that reinvented the insurance and wealth industry over the last 10 years.

Who has been the biggest influence on my career (and why)... The boss who gave me the opportunity to run my first P&L business at the age of 28. I was the youngest consultant in a team of 60, and I managed to turn around a 14-year loss into profitable business. I also have a mentor who used to be a peer to me, became a staff member of mine and for many years has given me good counsel on my career and life happiness. The actuary who has had the biggest impact on my career is Richard Shermon, an actuary from the UK who has been my boss in 3 jobs in 2 countries and is now my friend.

Why I'm proud to be an actuary... We do an important role for societal issues and business. We make a difference. We are independent and have integrity.

Annette presenting at the 2018 Joint Regional Seminar in Sydney

The most valuable skill an actuary can possess is... Communication skills.

If I were President of the Institute, one thing I would improve is... Promote actuarial skills to business and government, and to grow opportunities such as data analytics,

At least once in their life every actuary should... Go bungy-jumping! Only kidding (although I have done it). I think every actuary should speak with their real end clients or users of their work. It always bring amazing insights.

My best advice for younger actuaries... Work in as many different areas as possible. That way you gain broader perspective (which you can apply in any role) and you also have the opportunity to work out what kind of work you love.

If I could travel back in time, I would... Go to my sister's wedding, which I missed.

When I retire, my legacy will be... Bringing insurance to hundreds of millions of people who don't have access to it today, who need and will benefit from it.

Actuarial capabilities I use in my current job... The actuarial control cycle, in wide business applications and especially in the innovation space.

Skills actuaries should enhance to become more effective in my field of work... Communication skills.

One of the most creative applications of actuarial capabilities that I have used in my career... Setting up Galileo Platforms, the insurtech business. It can really have a big impact by enabling better client experiences and connecting everyone in the insurance ecosystem. At the end of the day, we hope it will provide insurance to more people who need it.

The most interesting or valuable job or project I have worked on in my career and why... Growing the Manulife Singapore business. Driving a massive client centricity culture change program and client-centred strategy across 11 countries. Establishing Galileo Platforms.

How my skillset evolved over my career... I like the analytical and financial aspects of business, but I also love the creative element of design and innovation; and the people of aspects of business, with clients and staff. So my career has focussed either on business leadership or client experience/marketing. It's always underpinned by the financials, but I do love creating new businesses or transformational change management. Both require a lot of people skills.

The most challenging job or project I have worked on and why… Turn-around situations are hard, but rewarding at the end. You can analyse why and create plans for what needs to be done .. but at the end of the day, you need to motivate people in a new direction. In a turn-around, you're usually starting from a negative position with demotivated or overworked staff. So you need to energise them and bring them on the journey of change, celebrate the minor successes and keep building on that. Putting energy into new creations is fantastic, and that's where I spend most of my time now … creating new business models and collaborations.

The advice I would give aspiring actuaries to be able to do my job.. Be creative. Be brave.

Mental health matters for private health insurance

By Andrew Matthews and Brendan Pon

Reading time: 6 mins

The recent Private Health Insurance (PHI) reform providing a psychiatric waiting period exemption will give PHI customers greater peace of mind knowing that they can upgrade and receive immediate private psychiatric care, without being thousands of dollars out-of-pocket. Here, Andrew Matthews and Brendan Pon outline the implications of this reform, and how it sits within the broader need to address growing mental ill-health treatment in Australia.

Mental illness is an important health issue in Australia with no segment of society immune. It affects people of all ages, gender, cultural backgrounds, socio-economic level and geographic region, whether directly or indirectly. Indications are 1 in 5 Australians experiences a common mental health disorder and almost half (45%) at some point in their lifetime (Australian Institute of Health and Welfare statistics).

Today is R U OK? DAY. Staying connected and having meaningful conversations is something we can all do.

Australians experience a wide range of mental health conditions with common conditions such as phobias, panic attacks and depression through to what can be serious disorders and illnesses like psychosis, schizophrenia, self-harm, personality disorders and nervous breakdowns. In perspective, the statistics on suicide indicate death by self-harm is greater than those for the road toll. Early intervention can improve lives but is not yet an incentive in our systems.

The objective of this article is to examine the current and emerging challenges for PHI in response to growing needs in mental health. The article covers:

- the role of private health insurance;
- recent reforms; and
- the implications for customers and Australians.

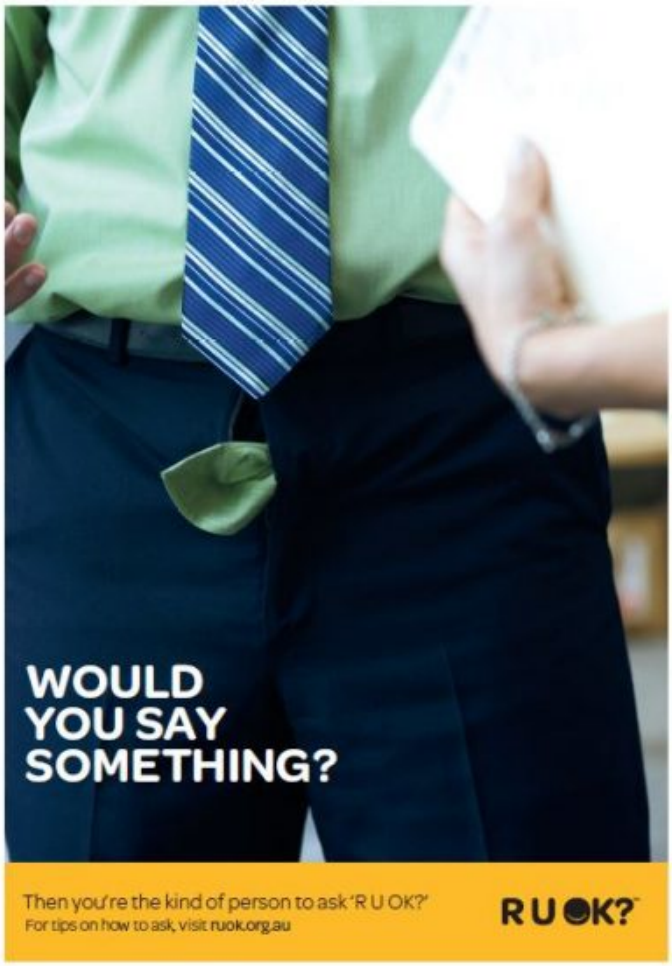
We conclude with a summary of the challenges faced and the competencies needed to address emerging issues.

The role of PHI in treating mental health in Australia

Hospital treatment of mental health issues is provided in major hospitals' psychiatric units or specialised psychiatric hospitals – private and public. Non-hospital treatment is provided by a range of health professionals - GP's, psychiatrists, psychologists, counsellors, nurses, community health workers and social workers – in community health centres, clinics and private practices.

More than $8.5bn pa is spent on mental health services in Australia (AIHW). Treatment in public hospitals is covered by State Governments, with no out-of-pocket costs to individuals. Treatment in private hospitals is paid by the patient or their PHI if they have cover. However, public hospital psychiatric beds are limited and generally only allocated to people at serious risk to themselves or others.

About half of Australians buy PHI for hospital cover. A mental health condition is one of only a very few conditions that, by law, cannot be excluded from a PHI policy.



Today is R U OK? Day. If you notice someone who might be struggling - start a conversation.

Hospital policies cover the cost of hospital accommodation (overnight or day only) and a proportion of the medical fees while admitted to hospital. Extras policies may cover part of the cost of psychology services or counselling outside of hospital, but not psychiatry or other Medicare-funded services. While insurers cannot exclude mental health cover, they can offer partial or restricted cover, with partial benefits for a limitation period of up to two years, or where the benefit is only sufficient to cover treatment as a private patient in a public hospital.

An initial admission at a private psychiatric hospital typical typically costs around $10K, spanning 2-3 weeks. There are also subsequent follow-up out-patient treatments. Of those that have a first admission over 60% of patients have a second hospital admission.

Until recently, PHI customers were only able to access full cover private psychiatric treatment if they were on a top tier hospital insurance product. This left customers on lower hospital covers the unsatisfactory options of:

- Receiving 'minimum benefits' and be thousands of dollars out of pocket; or

- Foregoing treatment.

Some might upgrade to a top tier cover and wait the two month waiting period to access treatment. However, the nature of mental illness often means that there is narrow window of opportunity for people to be treated. If missed, the result could be a worsened condition requiring longer treatment … or the ultimate human cost.

In the Actuaries Institute Green Paper Mental Health and Insurance, it was estimated PHI funds spend approximately 6% ($540 million) of national expenditure on mental health-related services. Health insurers estimate they cover 90% of day admissions for mental health care, and 50% of all mental health hospital admissions.

Recent PHI Reforms – Psychiatric waiting period waiver

On 13 October 2017, the Minister for Health, announced a series of reforms to PHI. One item of reform gave PHI customers a one-off psychiatric waiting period waiver. This allowed customers to upgrade their insurance and immediately access full cover private psychiatric treatment without serving a waiting period.

The mental health waiting period exemption was given effect through the *Private Health Insurance (Complying Product) Amendment (Psychiatric Care) Rules 2018* on 1 April 2018. The once per lifetime waiting period exemption triggers when all three following events occur:

- Customer transfers to a product providing higher psychiatric benefits than the old product;
- Customer is admitted for psychiatric treatment within two months following the transfer; and
- Customer elects to utilise the once-off exemption and receive higher benefits for that admission.

As part of the record management and portability between insurers, health insurers will include information on use of the psychiatric waiver exemption on Transfer Certificates. Insurers will continue to have discretion to waive psychiatric care waiting periods, including for customers who have already used the exemption.

Implications for customers and Australians

The recent PHI reform providing a psychiatric waiting period exemption will give PHI customers greater peace of mind knowing that they can upgrade and receive immediate private psychiatric care, without being thousands of dollars out-of-pocket. This is especially relevant for individuals that are struggling with living costs, allowing them to retain PHI on lower levels of hospital cover. This will strengthen the relevance of PHI and serve as another reason for Australians to join or keep their cover.

More important is the positive impact on the lives of PHI customers, who can access immediate psychiatric treatment to assist their recovery, maybe even save their lives. The psychiatric treatment options for Australians are:

- Use the public system;
- Self-fund (expensive with even initial treatments costing around $10,000 +); or
- Buy PHI with 'Gold' cover that provides most treatments being over $2,000 per annum and more basic cover at around $1,300 plus per annum for individuals.

PHI is community rated, meaning that insurers cannot set premiums based on age or health status, cannot decline cover, cannot put special conditions or exclusions on an individual policy and policyholders can change insurers without having to re-serve waiting periods.

Like other insurance, PHI is underpinned by risk pooling. Insurers collect premiums from many individuals and pay out claims to those that need to make claims over the same period. If this balance is somehow distorted, for example by escalating frequency or cost of claims, the viability of the insurance product may be jeopardised and consumers' access to cover may be affected. While there is a 'risk equalisation pool' in PHI to share the high cost arising from older members, it does not mitigate the anti-selection risks in relation to younger chronic mental health sufferers. And given it is a system of cost sharing among PHIs, it does not address the issue of funding the need for increased care services for mental health needs.

Conclusions:

Mental health matters. There remain challenges facing mental health services and the role of PHI. Australia's health and insurance systems have not yet adequately responded to the burden of mental health disorders. Potential considerations include:

- *Coverage Availability* - The top cover or 'Gold' policies in the market include mental health cover without restricted benefits or benefit limitation periods, while lower cost policies usually have restrictions. The recent reforms offer a waiting period waiver meaning those with basic policies can upgrade if they unexpectedly require treatment for mental health issues.
- *Data and Analytics* – There is a role for insurers to collaborate to strengthen information systems, evidence and research for mental health.
- *Community rating* - These rules make it difficult for an insurer to offer better benefits than competitors or than the public system for mental health conditions. Because many of the conditions are chronic or recurring, more generous inpatient psychiatric benefits often see clusters of transfers from other insurers, based on particular hospitals or practices recommending to their patients that they switch.
- *Sustainable Financing* – With pressure to lower premiums there is reduced incentive to serve and attract patients with chronic mental health conditions and consequently incurring high costs from psychiatric hospital claims. What is needed is consumer choice and development of more durable health financing models for optimum care and cost efficiency.

These issues with mental health conditions in PHI are part of the current debates about affordability and value. Getting help should not be seen as "a sign of weakness" but "a sign of strength" - true for individuals and also for our health and insurance systems. At stake are the services we need for the mental health of the nation and the successful response of our mixed public and private healthcare system.

The topic of mental health features at the **General Insurance Seminar (GIS) 2018** with a focus on actuaries and insurers making a positive contribution to reducing the mortality, morbidity and disability for persons with mental disorders.

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The HIH Royal Commission: Lessons for today - Actuaries Podcast

By Stephanie Quine *(stephanie.quine@actuaries.asn.au)*

Reading time: 4 mins

Estelle Pearson and Tony Coleman share their unique insights into the HIH Royal Commission, from watching lawyers finding 'smoking guns', to requests for interviews from 4-Corners. They reflect on lessons learned, as the current Financial Services Royal Commission enters its sixth set of public hearings.

Estelle and Tony, both past President's of the Actuaries Institute, met at Institute HQ on 31 August for a conversation about their experiences of the HIH Royal Commission.

Listen to "The HIH Royal Commission - Lessons for Today" on Spreaker.

Listen on Apple Podcasts

Listen on CastBox

Tony was President of the Actuaries Institute and Chief Actuary of IAG when HIH Insurance collapsed in March 2001, in what was the largest corporate collapse in Australia's history.

The events that followed radically affected his Presidential year. As the Commission's and the media's attention turned to actuaries for explanations of the collapse, the Institute took the opportunity to suggest possible solutions early in the piece. Some of these (which were later adopted) included:

- to require a statutory role for an approved actuaries in non-life insurance companies, which at that time didn't exist; and
- to require that formal valuation reports and financial condition reports be provided to the board.

"We couldn't just say to people like 4-Corners and Alan Jones "no comment" or go on the defensive, so we decided very quickly...we had the get on the front foot and make the actuarial profession part of the solution rather than part of the problem," said Tony.

Estelle is a Plenary Speaker at the upcoming General Insurance Seminar. Tickets on sale now.

Scenes from the current Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry have been unfolding in hearings and on the official webcast since Round 1 began in March 2018. Senior management, heads of insurers and regulators have been asked to answer wide ranging and at times uncomfortable questions about behaviour towards customers.

Round 6 examining insurance began yesterday (Monday 10 September) in Melbourne. Here are the facts so far:

Public submissions - Fast facts

As at 31 August 2018

Submissions received	Top 3 – submissions by industry	Main nature of dealings
8657	Banking 63% Superannuation 12% Financial advice 9%	Personal financial Superannuation Small business finance

Inside a Royal Commission - the 'theatre' of court

As the actuarial expert to the HIH Royal Commission, Estelle assisted Justice Owen and Council to understand the fundamentals of insurance, and how reinsurance and actuarial reserving works.

She worked alongside lawyers and their assistants as they trawled through emails, handwritten notes and any other documents the Commission had called for.

The excitement that ensued when a 'smoking gun' (usually an email) with regretful remarks was found was palpable, Estelle said. One piece of evidence she recalled precisely was an email typed on June 6 1998 by Sydney reinsurance broker John Tuckfield. It read:

> "This really is crunch time for us. If we can pull this off we will be loved forever. Daniel has promised to kiss our collective butts."

The Daniel referred to was former FAI chief operating officer Daniel Wilkie.

> *"Lawyers love the theatre of the Commissions and the courts so every piece of material they get like that they absolutely make the most of it," said Estelle.*

Best to 'fess up'

Tony and Estelle discussed their observations of witnesses in past Royal Commissions, agreeing on the importance of "fessing up" to questionable behaviour.

"You're much better to fess up to any issues and move on because if you try to avoid it, they'll just make minced meat of you," said Estelle, adding that

> *"When you get into that kind of hot house environment, it all becomes about protecting the company and what people don't do is step back and ask, is this right?"*

Tony encouraged any actuary providing advice to consider how it would look on the front page of a major newspaper.

Estelle was also a consulting actuary to the Royal Commission into Institutional Responses to Child Sexual Abuse where she helped the Commission think about how large a redress scheme might be and what the costs might be like. Estelle's colleagues summarised the Commission's final report on Redress and Civil Liability, and the estimates and framework used by actuaries for assessing liabilities in Actuaries Digital articles.

Estelle Pearson is a Plenary Speaker at the upcoming 2018 General Insurance Seminar in November. This is the flagship event for the General Insurance Industry with a fantastic Program - Don't miss out on tickets - Register now!

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Insurance Inside Super – Federal Budget Changes

By Kajal Pandya

Reading time: 4 mins

Kajal Pandya reports on the recent "Insurance Inside Super – Federal Budget Changes" Insights session. The session covered an interesting discussion around the challenges that superannuation funds and group insurers will face and the unintended consequences of the proposed Federal Budget changes.

Insurance Inside Super - Federal Budget Changes

A majority of the working population in Australia rely on their default insurance inside super for cover in their time of need. However, the recent Federal Budget has proposed changes that are set to shake up the way group insurance is provided for many Australians and will have a significant impact on the Superannuation and group insurance industry.

Under the proposed changes, insurance will be opt-in rather than default for members that have account balances below $6,000, new members who are under 25 years old and member accounts that have not received a contribution for 13 months or longer. The objective of the proposed changes is to stop erosion of retirement balances through insurance premiums and improve member outcomes. These changes follow the recent Insurance in Superannuation Voluntary Code of Practice for Superannuation funds but unlike the code, these changes are compulsory and need to be implemented by 1 July 2019! It is estimated that due to these changes nearly half of superannuation member accounts will lose their insurance cover.

The Actuaries Institute recently held a panel discussion on "Insurance inside super - Federal budget changes" in both Sydney and Melbourne, which was led by Richard Land - Head of Insurance, Australian Super. Other speakers on the panel were Michael Lin (Senior Pricing Manager at TAL and currently the secretary of the Actuaries Institute Insurance in Superannuation working group) and Hoa Bui (Partner In Charge, Actuarial and Financial Risk at KPMG Australia). The sessions generated a high level of interest amongst members of the actuarial community and over 250 members of the Institute (including myself) were fortunate enough to attend this interesting discussion. Key issues covered in the discussion were challenges for superannuation funds and group insurance providers and other unintended consequences of the proposed changes.

Challenges for Superannuation funds:

Richard Land leading the discussion

Despite industry wide recommendation for a later deadline, the Senate Economics Committee reviewing the legislation has recommended the Bill be passed without any changes. The measures under the legislation which will result in 50% of members losing their default insurance cover leaves little time for superannuation funds to renegotiate insurance contracts with their insurers, send member communications, update administration systems and processes and train customer service staff by 1 July 2019. This introduces significant operational risk. Fairness of member outcomes is another issue that the funds will need to address. For example, members who

lose their cover due to changes may need to opt-in (even though they have paid premium for many years and their health have has deteriorated) and funds and insurers will need to decide whether or not these members will be underwritten to reinstate their insurance cover. Opt-in members who work in high risk occupations or are involved in risky activities or whose health has deteriorated over time may be denied cover or may be granted cover with a steep loadings. Is this a just outcome for a member who has paid insurance premiums for years and has now become an opt-in member?

Challenges for Group insurance providers:

Michael Lin discussing challenges and risk mitigation for insurers

Just like any other insurance, group insurance is a pool and the removal of younger members and other default members will have a significant pricing impact on remaining members in the default pool. Also, expense margins are likely to increase as expenses will not decline in the same proportion as reduction in premiums from removed members. This is anticipated to lead to price increases which would depend on the fund size, membership profile of the fund and premium rate structure. Various risk mitigation measures will also be adopted as the risk profile of the membership will change due to increase in anti-selection from opt-in members. Additional pricing assumptions will be required for increased claims uncertainty.

Unintended consequences:

Hoa Bui discussing unintended consequences of the Federal Budget

Hoa spoke about the modelling she and her colleagues at KPMG performed to estimate the impact on retirement benefits of the current default regime and also of the proposed regime. Hoa highlighted major sources of information that were used and the difficulties encountered in undertaking such a task.

It is a well-known fact that many workers in Australia have more than one superannuation account. The speaker highlighted that the key contributor to account balance erosion was the issue of multiple accounts rather than insurance, as members with multiple accounts are likely to have only one active account leaving other dormant accounts vulnerable to erosion from insurance premiums. Consolidating these multiple accounts (a task that can be handled by ATO) can alone solve majority of the account balance erosion problem.

Another key observation was that the real cohort that needs to be protected from insurance premium erosion are low income earners or women as they are most impacted rather than younger/inactive members. Reducing insurance cover for younger members is likely to increase the underinsurance problem in Australia and ultimately the social burden on the government.

The discussion was wrapped up with a very interactive question and answer session in which the speakers thoroughly answered questions brought up by the attentive audience. Audience on webinar also participated in the question and answer session using the web based application sli.do. At the end of the session, many in the audience left feeling that despite putting in all the hard work into the material insurance changes, the government objectives may only be partially met if insurance premiums were to rise for default members and opt-in members were to face underwriting and/or premium loading.

History of AI Winters

By Milton Lim *(milton.lim@taylorfry.com.au)*

Reading time: 5 mins

Artificial intelligence (AI) is a very popular topic in the media now, but the concept of AI was first proposed almost 70 years ago. What happened in the AI research community over this time period and why did it take so long for the breakthroughs to occur? Milton Lim looks at the booms and busts of the AI industry over the years.

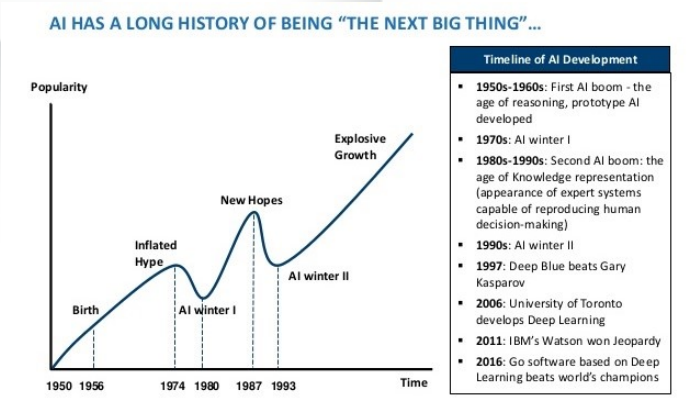

Figure 1: The boom and bust cycle of AI research

"AI will be either the best, or the worst thing, ever to happen to humanity." – Stephen Hawking

The beginning

In 1950, Alan Turing posed the question "*Can machines think?*" [i]. As the concept of 'thinking' is difficult to define, he proposed a simpler question, such as whether a machine could *imitate* a human being during a conversation with another human. Known as the Turing Test, this involves a human judge asking questions to an unknown party in another room, who may be either human or machine, to evaluate whether they are human or not. The machine passes the test if it can convince the judge into believing it is human. The Turing Test was significant because it provided the first solid benchmark to answer the question "*Can machines do what we humans (as thinking entities) do?*"

"Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it."

The field of AI research was officially born in 1956 at the Dartmouth Conference which introduced the term "artificial intelligence" to unify the various research efforts in cybernetics, automata theory, and complex information processing to give machines the ability to "think". A small group of prominent researchers including John McCarthy, Marvin Minsky, Claude Shannon and Norbert Wiener proposed that "*every aspect of learning or any other feature of intelligence can be so precisely described that a machine can be made to simulate it*." This provided a clear pragmatic direction for subsequent AI research efforts.

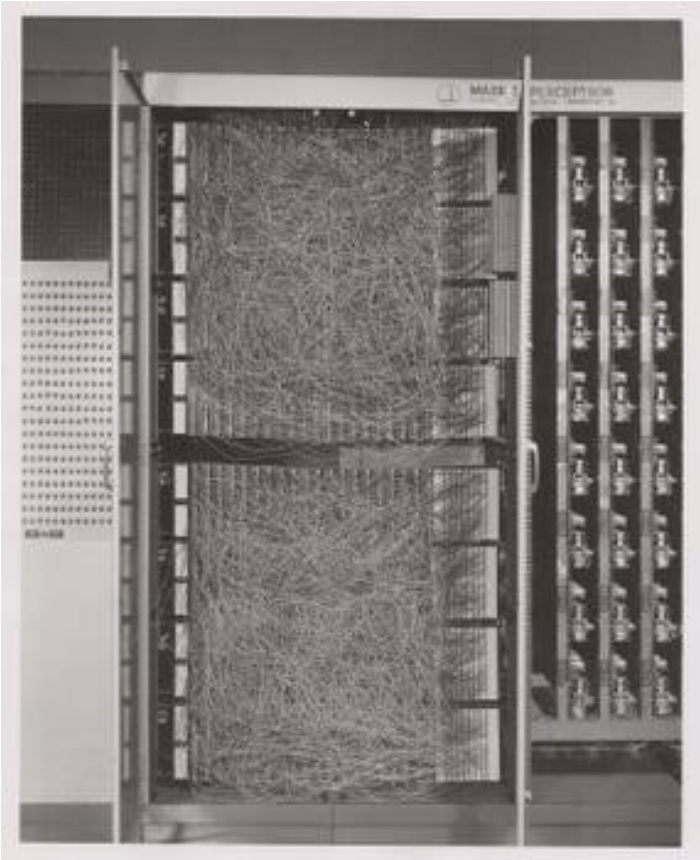

Figure 2: The first implementation of the perceptron in the Mark I Perceptron machine that could recognise images with a 20 x 20 pixel camera.

In 1958, Frank Rosenplatt created the perceptron learning algorithm, the simplest type of neural network with only one layer of neurons connecting inputs to outputs. The New York Times sensationally reported the perceptron to be *"the embryo of an electronic computer that the Navy expects will be able to walk, talk, see, write, reproduce itself and be conscious of its existence*." However, it was proven that the single layer perceptron could only recognise linearly separable patterns, but not more complex types such as the XOR (exclusive OR) function.[i] The field of neural networks stagnated for a decade, until it was realised that multi-layer perceptrons, with sufficient computing power and data, were a very effective way of modelling more complex non-linear functions. This is the principle behind current research in deep learning with many complex layers of neurons, such as those used by Google DeepMind's AlphaGo to defeat Lee Sedol at the game of Go

Past AI Winters

AI research has endured a bumpy journey and survived two major droughts of funding, known as "AI winters", which occurred in 1974 – 1980 and 1987 – 1993. Although the field suffered collapses in the perception of the value of AI by government bureaucrats and venture capitalists, researchers continued to make advances despite the criticism.

In 1973, the UK Science Research Council commissioned the Lighthill Report[ii], which criticised the utter failure of AI to achieve its "*grandiose objectives*" and noted that "*in no part of the field have the discoveries made so far produced the major impact that was then promised*." At a similar time, Richard Karp famously proved 21 difficult problems in computer science to be NP-complete[iii], which led to the famous unsolved P vs NP problem with a $US1 million reward prize.[iv] This highlighted the problem of "combinatorial explosion", where the computing time required to solve the problem increased exponentially as a function of the input size. This meant that it was impossible to scale up any of the AI solutions to toy problems into useful real-life applications with the available hardware. The curse of dimensionality had struck a blow on AI research.

The hard problems are easy, and the easy problems are hard.

Another fundamental limitation, known as Moravec's Paradox, states that "*It is comparatively easy to make computers exhibit adult level performance on intelligence tests, playing checkers or calculating pi to a billion digits, but difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility… The mental abilities of a child that we take for granted – recognizing a face, lifting a pencil, or walking across a room – in fact solve some of the hardest engineering problems ever conceived… Encoded in the large, highly evolved sensory and motor portions of the human brain is a billion years of experience about the nature of the world and how to survive in it.* "[v] In short, the hard problems are easy, and the easy problems are hard. This explains why research into computer vision and robotics had made so little progress by the 1970s.

Over the next decade, business investment in the AI industry boomed from a few million dollars in 1980 to billions of dollars in 1988. Expert systems, such as XCON, LISP machines, and Symbolics, became very popular as specialised systems that simulated the decision-making ability of human experts to solve narrow specific problems such as diagnosing infectious diseases or identifying chemical compounds. Meanwhile, desktop computers from Apple and IBM had been steadily gaining speed and power (as per Moore's Law) until they overtook the more expensive LISP machines. These expert systems eventually proved too expensive to maintain as they were difficult to update, could not learn, and were brittle, rather than robust in handling unusual inputs. As consumers no longer needed to buy an expensive machine specialised for running LISP, this led to the collapse of the market for specialised AI hardware in 1987. Thus, an entire industry worth half a billion dollars was replaced in a single year.

The Future

"AI is the new electricity." – Andrew Ng

Andrew Ng, Professor of AI at Stanford University, has optimistically described "AI is the new electricity". His personal view is that "*Hardware advances will provide the fuel required to make emerging AI techniques feasible. Multiple hardware vendors have been kind enough to share their road maps and I feel very confident that they are credible, and we will get more computational power and faster networks in the next several years.*"[vi]

Perhaps the current AI boom might one day reach the hypothesised "Technological Singularity", where the exponential increase in computing power will result in the creation of an artificial superintelligence which surpasses the total of human intelligence. This would cause a runaway chain-reaction of self-improvement cycles where the machine intelligence can advance itself without the need for human effort. This is argued to result in an intelligence explosion radiating outward from Earth, until it saturates the entire universe. Some authors have predicted this Singularity to be reached as early as 2045.[vii]

This raises some deep philosophical and ethical questions[viii] that have been explored in countless books and movies:

- Can a machine have emotions?

- Can a machine be self-aware?
- Can a machine be original or creative?
- Can a machine be benevolent or hostile?
- Can a machine have a soul?

These ethical considerations will have to be developed in parallel with the technological capability of emerging AI models. For a considered view of how AI and machine learning will change society, I highly recommend the UK Royal Society 2017 Report "*Machine Learning: the power and promise of computers that learn by example*"

In the next article in this series, we will examine the "curse of dimensionality" in machine learning and statistics to understand the major obstacles to success for AI technology.

[i] Turing, Alan (1950), "Computing Machinery and Intelligence", Mind

[i] Minsky & Papert (1969) "Perceptrons"

[ii] Lighthill, J. (1973), "Artificial intelligence: a general survey", Artificial intelligence: a paper symposium

[iii] Karp, Richard (1972), "Reducibility Among Combinatorial Problems", Complexity of Computer Computations

[iv] Clay Mathematics Institute http://www.claymath.org/sites/default/files/pvsnp.pdf

[v] https://en.wikipedia.org/wiki/Moravec%27s_paradox

[vi] https://www.technologyreview.com/s/603062/ai-winter-isnt-coming/

[vii] Kurzweil, Raymond (2005), "The Singularity Is Near: When Humans Transcend Biology", Viking

[viii] https://en.m.wikipedia.org/wiki/Philosophy_of_artificial_intelligence

The ethics of machine learning - Podcast with Tiberio Caetano

By Stephanie Quine *(stephanie.quine@actuaries.asn.au)*

Reading time: 3 mins

With companies starting to pay the price for inadvertent unethical outcomes created by their systems and engineering, there is a need for data science professionals to understand and respect the discipline of ethics.

"Artificial Intelligence" (AI) conjures fear, excitement and confusion in humans.

In this podcast episode, Tiberio Caetano, Co-Founder and Chief Scientist at Ambiata, one of the most respected data science companies in Australia, clears up some of the confusion by unpacking the complex problem of ethics.

Tiberio is interviewed by Anthony Tockar, Director at Verge Labs and Curator of the Data Digital Track at the upcoming General Insurance Seminar (GIS2018).

Listen to 'The Ethics of Machine Learning - Interview with Tiberio Caetano (Co-Founder & Chief Scientist at Ambiata)' on Spreaker.
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Tiberio explains two sub-problems within ethics: the **valuation problem,** which is about the desirability of a given world, and **the causation problem** which is more of a navigation problem about what one has to do to obtain the result they want.

Ethics can also be conceptualised through the lens of **descriptive ethics**, which is about what people think is right and wrong (and this varies depending on time, place and culture), and that of **normative ethics** which is about improving the world in an objective way, more in line with converging ideas of human rights and fundamental morality.

Anthony Tockar asks Tiberio Caetano to consider how ethical problems manifest in machine learning and data science.

Tiberio notes that ethical questions arise *after* you collect your data, develop your models and predict certain risk scores, and it is important to separate knowledge from action.

> "...the real important question now is what are you going to do with that knowledge?" - Tiberio Caetano

Many things determine risk. Should where you were born and what you did in the past impact your risk score if it has nothing to do with your agency?

Cue the confusion.

Anthony raises an argument that sometimes arises in actuarial work "to go for weaker models" because you're less likely to make errors or adverse decisions, but says this never sat well with him.

This strategy could see you miss out on knowledge that could help make a better decision.

As Tiberio says:

> "[Ethics is] about understanding the world as it is not as we would like it to be, but as it is." - Tiberio Caetano

He urged data scientists, practitioners and actuaries to respect the word ethics, and the knowledge associated with it.

"Get to know what actually is good for people and start behaving accordingly," said Tiberio.

Access Podcast Transcript.

Listen to our CareerView Podcast on Managing a Data Analytics Team and look out for an upcoming CareerView episode, with Tiberio and Anthony discussing: A Career in Data Science.

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One father's motivation to take parental leave - CareerView Podcast

By Lesley Traverso and Ashish Ahluwalia *(ashish.ahluwalia@finity.com.au)*

Reading time: 2 mins

Transactions Actuary at Swiss Re, Eric Tsui, discusses his thinking around taking paternity leave, and the support he received from his employer to do so.

This instalment of the Institute's Diversity and Inclusion podcast series discusses the topic of parental leave with an interview between Ashish Ahluwalia (Principal at Finity Consulting) and Eric Tsui.

The pair discuss how employers who are:

1. committed to diversity and inclusion in its broadest sense; and
2. allow their employees to achieve a real balance between work and family

are able to increase their employee retention.

Listen to 'Paternity Leave - CareerView (Diversity and Inclusion)' on Spreaker.

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In the podcast, Eric describes the difference between being in the workplace and being on parental leave.

> "When you are on parental leave your mind is kind of idle, but it's a very physical kind of job, wrangling a baby or just pushing the pram for kilometres on end." - Eric Tsui

Children grow up so quickly and as Eric says "every moment, every time they do something it could be the last time that they do it because they move into a different phase".

The main benefit to Eric has been "developing a closer bond with my son". Luckily, both his and his wife's employers enabled this family to be there for those important moments.

You can download the Transcript to this episode and listen to our first and second instalments in the Diversity and Inclusion podcast series.

Read about the Diversity and Inclusion Working Group's (DIWG) goals and members.

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Health Insurance Reform: Challenges and Opportunities

By Shaini Sivagnanam

Reading time: 5 mins

New Private Health Insurance (PHI) reforms that will come into effect on 1 April 2019 will present health insurers with a range of challenges and opportunities. Shaini Sivagnanam reports.

Health actuaries have been quite busy over the past few months trying to make sense of the various reforms that were introduced by the department of Health to address the challenges of affordability and complexity of Private Health Insurance (PHI) in Australia. Some of these reforms (although not yet finalised) will come into effect on 1 April 2019. The new reform measures present health insurers with both a challenge and an opportunity:

- How to minimise the impact on existing business?
- How to maximise the opportunity to grow the business?

The challenge

Most of the reform measures introduced will be mandatory and may have significant consequences to both health insurers and their policy holders. By understanding how these measures are going to be impacting their policy holders and their overall business, health insurers will be able to better prepare for the change. Some of the reform measures that can be significant for an insurer are:

- **Introduction of Gold/Silver/Bronze/Basic product categories, Clinical Categories and Removal of Restrictions**

  In his article, "Health Insurance: Metallic paint, Game theory and Product categorisation", Barry Leung presents a detailed description of the product categorisation and the implications for health insurers. For consumers these reform measures provide greater clarity around what clinical services will be covered in hospital policies. They also provide a clear mechanism for consumers to compare products across the industry.

  The removal of restrictions from Bronze and Silver categories will mean that consumers will no longer be able to claim benefits from their insurer for being treated as a private patient in public hospitals when the clinical category is not covered under the policy. Restrictions will be allowed on Basic products only except for hospital psychiatric services and rehabilitation, which can be restricted under Bronze and Silver. Although some larger insurers have already moved away from offering restrictions, many smaller not-for-profit funds are continuing to offer restrictions on their products.

So, what are some of the challenges that face health insurers?

- Existing products may no longer comply with the new legislation and may require extensive changes. Any new addition of services will be costly for the insurer while removal of any services (including restrictions) may trigger member lapses.
- Existing "Bronze Hospital" and "Silver Hospital" products may no longer be classified as Bronze or Silver. Even when no changes are made to the services covered the change of names from Silver to Bronze plus or from Bronze to Basic plus may be perceived as detrimental by policy holders.
- If the existing products are classified as a plus product then there might be a risk that policy holders do not value the additional services of the plus product and look for a cheaper minimum Basic, Bronze or Silver product.
- **Changing coverage for some natural therapies**

  Health insurers are mandated to remove natural therapies (including but not limited to yoga, pilates and tai chi) from their general product offerings. Removing these services will reduce the cost of PHI however, it will be a detrimental change for policy holders that utilise those services.

  It should be noted that any savings generated from the removal of these services should be considered in light of policyholder reaction to this change, for example the potential increase in lapse rates.

- **Improved access to travel and accommodation for regional and rural consumers**

Travel and accommodation benefits are currently only offered in top level general treatment products. From 1 April 2019, insurers will be able to offer these benefits under hospital products providing greater access to private care for regional and rural consumers. Some of the challenges that insurers (especially those regional insurers that cater for local consumers) may face include:

- Regional specific insurers may currently be able to offer cheaper hospital products due to their policy holders having limited access to private services locally. Adding travel and accommodation benefits under hospital cover can be quite costly for these insurers where their policy holders are concentrated in one specific area. On the contrary, larger insurers may be able to spread the cost across Australia. Although addition of these services is not mandatory, it may be necessary for regional insurers to remain competitive. At the same time, addition of these services will mean that prices will need to go up making the prices less competitive.
- Introduction of these services under hospital covers may mean that policy holders who once purchased general treatment cover for the sole purpose of accessing these services no longer need it and want to lapse or downgrade their general treatment cover.

The opportunity

The government has introduced a couple of other measures as part of the reforms that specifically address the challenges of affordability and declining PHI participation in Australia. Although they are voluntary measures, the combination of these together with the categorisation of Gold, Silver, Bronze and Basic present an excellent opportunity for health insurers to revise their overall business strategy for growth.

- Increasing voluntary maximum excess levels

  The maximum allowable excess on a hospital policy is set at $500 for singles and $1000 for couples or families. Currently 80% of the hospital policies have some form of excess[1]. As the cost of health insurance policies is getting dearer consumers are looking for options to reduce their premiums through downgrading. Increasing the maximum to $750 for singles and $1500 for couples and families will mean that from 1 April 2019, consumers will be able to further lower their premiums by purchasing a higher excess product.

  For an insurer, healthier policy holders downgrading to products with higher excesses will mean reduced revenue while no changes to claims cost. At the same time, if the insurer does not offer higher excess products when the competitors do at a lower price then, that might cause loss of sales or healthier policy holders moving to competitors.

- Discounts for 18 to 29-year olds

  Health Insurance in Australia is currently community rated, meaning insurers cannot risk rate by age, sex or health status. As a result, younger and healthier members of the population are seeing less and less value in PHI and are moving away from it altogether.

  To encourage young people to take up private health cover, the government has legislated voluntary discounts. From 1 April 2019 health insurers will be able to offer discounts of up to 10% for policy holders between the ages 18 and 29. This means someone who takes out health insurance policy at the age of 25 will be able to maintain the 10% discount until they turn 41. The discount will be phased out after the age of 41.

  The financial impact can vary significantly from insurer to insurer depending on their portfolio mix, target profitability and the level of access to open market. An insurer with predominantly older policy holders will be able to offer the discount at a lower cost compared to a specialist corporate fund that's target market is young corporate employees. An insurer operating for profit will be able to accommodate the cost easier than a not for profit insurer with lower target net margin. Accessing the additional sales required to offset the cost of the discount might be easier for a large and open health insurer compared to a small insurer with restricted membership.

  If offering a discount on existing products is costly, an insurer may instead consider introducing new products with discounts. This may involve closing some of the currently existing products. The advantages of introducing new products include:

- Increased sales due to discounted products for 18 – 29-year olds;
- Correctly priced products and therefore minimal financial impact on the existing business;
- No higher rate increases to existing policy holders; and
- An opportunity to upgrade existing 18-29-year-old policy holders to new discounted products.

The PHI reform presents a lot of uncertainty to health insurers and actuaries are best placed to assist them with their ability to quantify the impact through various scenario modelling. It is also an opportunity for actuarial graduates to be involved in health insurance as it presents unique opportunities that are not available every day.

[1] http://www.health.gov.au/internet/main/publishing.nsf/Content/private-health-insurance-reforms-fact-sheet-increasing-maximum-excess-levels

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