Institute of Actuaries of India

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THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

May 2020 Issue

Vol. XII - Issue 5

Pages 36• ₹ 20

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

Celebrating 75 years of Indian Actuarial Profession

Remembrance of N K Parikh by M/S K A Pandit

On 22nd May 2020, M/s. K. A. Pandit lost one of its Senior Partners and Patriarch Shri N.K. Parikh. He was our inspiration, our light, our friend, philosopher and guide having left us with such a rich legacy while inculcating in each of us a zeal to learn and achieve goals and grow, such that we live by his mantra "After all, history is made every day." Hence, on this occasion we would like to share our remembrance of him:

Remembrance by Shri Piyush Majmudar

My association with 'Parikh', as I fondly called him, goes back 67 years when we first met in New India. We were colleagues in Mumbai and Shimla, where we also stayed together. Our association continued in M/s. K. A. Pandit and we spent 20 golden years as partners with 2 other legends - Shri Mukund Diwan and Shri Dharmendra Pandit. Parikh was a great professional, a very good Actuary with deep insight and knowledge in the Actuarial profession. His contribution to the profession was immense and the profession will really miss him. He was also a great human being - very warm and caring towards his family, his staff and his colleagues. He was very well read and knowledgeable in every field and it was great talking to him and understanding his perspective on various aspects of life. He also had a great sense of humour. He made an outstanding contribution to Gujarati literature. 'Smaranjalika' is a great example of his vision and love for spirituality and Gujarati. It is an integral part of many households in India and abroad. He was a great family man and created an institution at home. Last but not the least, he was one of my best friends and I looked up to him on various occasions. I shall really miss him. While his loss is difficult to express in words, we will have very sweet memories of him - His warmth, His smile, His attire, His knowledge, His humour, the list is unending. We wish his family all the best and we shall continue to remember him for a long long time.

Remembrance by Shri Dharmendra Pandit

The Pandit family's association with Shri N. K. Parikh is since 1953 when he worked as a trainee under my father Shri K. A. Pandit. When he visited my father last on 18th January 1993 before he passed away on 22nd January 1993, it made me realise my father had such fondness for him that he recognised him and offered Tea and Chivda, whereas we were thinking that he was not conscious but instead he was in real "Sthit pragya" state! The accomplishments of Parikh are many, be it his graduate, law and actuarial degree along with passing the I.A.S written examination but for the actuarial profession he was a founding pillar as he was signatory when the Actuarial Society of India was registered. All us partners of M/s. K. A. Pandit had a familial bond as is evidenced by the few minutes it took in the GCA at New Delhi to agree on cementing our partnership in the Firm. Thereby, in the year 2000, on 5th April 2000, Gudi Padva, Shri M.G. Diwan, Shri N.K. Parikh, Shri P.I. Majmudar, Shri Akshay Pandit and I became partners in M/s. K. A. Pandit. This bond and numerous blessings have helped M/s. K. A. Pandit be whatever it is today and I am thankful that Shri Parikh and Shri Majmudar could see the Firm completing 77 years. I remember my last interaction with him wherein we greeted each other with Jai Shree Krishna and Suprabhatam. I will miss his guidance and incredible wit. As per Shreemad Bhagvad Gita His Soul has merged with God.

Remembrance by the M/s. K. A. Pandit Team

Rarely do you find someone that encourages you to challenge norms and push boundaries in your quest for knowledge and growth whilst providing unconditional support! Shri N. K. Parikh, lovingly called as Parikh Uncle or Parikh Sir in the Firm was one such soul. He was an inspiring and dynamic personality who was always available to listen to all of us and provide simple yet brilliant and effective solutions to any issues that were discussed with him. Even as a nonagenarian, he had so much passion for his work that he would not miss even a day without being updated about everything. His slogan that inspired us was - "Make success a habit". He regularly reminded us to follow a rigorous routine, telling us that otherwise success will not fall into your lap. He helped us hone our study habits by sharing his mantra, "When I am studying any subject, I want to gain enough knowledge to write a book on the subject. I would read widely and deeply. I would explore alternative approaches." He had a multi-dimensional persona with extensive knowledge about a wide range of topics, which he always discussed with a childlike wonder and was always curious to learn more. His thirst for knowledge was unparalleled and thereby his contribution to the enrichment of our professional and personal lives is beyond compare. Apart from work, we were in awe of the way he maintained his health, available and active till the last breath. His last message to us was "As loyal colleagues you have to fulfil my incomplete desires". Hence, it is with his experiences, guidance and blessings that we want to carry forward his legacy. May his soul rest in eternal peace.

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"A noble man's thoughts will never go in vain. -Mahatma Gandhi."
"I hold every person a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to help and ornament thereunto - Francis Bacon"

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Printed and Published monthly by Vinod Kumar Kuttierath, Head of the Education and Training, Institute of Actuaries of India at PRINT VISION, 75/77, 1st floor, Punjani Ind. Estate, Near Abhishek Hotel, Khopat, Thane (W) 400 601, for Institute of Actuaries of India L & T Seawoods Ltd., Plot No. R-1, Tower II, Wing F, Level 2, Unit 206, Sector 40, Seawoods Railway Station, Navi Mumbai 400 706
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From President's Desk

Mr. Sunil Sharma

A great ancient Philosopher Confucius (551 BC-479 BC) said: "Our greatest glory is not in never falling, but in rising every time we fall". The world is facing the deepest fall in its history, however humans are also showing signs of rise everywhere. Necessities are like flow of water; when it is blocked it finds many other ways to flow.

The world cannot stop for a long time for all its necessities for any reasons, we never stopped either. From the Institute's functional and professional activities, we have channelized almost everything on a virtual mode. The social distancing situation lead to experimenting and adopting webinar models for all meetings and seminars which have been found to be extremely successful and effective in terms of much wider and global participation and delivery.

The Indian Actuarial Profession conducted many webinars recently within a short span of time:

Event	Advisory Group	Date
1st Webinar on retirement benefits	AGPBEBSS	08-05-2020
Webinar on Data Science and Analytics	AGDSA	22-05-2020
Webinar on Data Science and Analytics	AGDSA	23-05-2020
Webinar on "COVID19 in India- An actuarial perspective	IAI Pandemic research group	26-05-2020
Webinar on COVID 19- Health insurance implications and way forward	AGHI	29-05-2020
Webinar on Micro insurance landscape in India	AGMI	05-06-2020
Webinar on General Insurance	AGGI	11-06-2020
Web COVID 19 - Response to business risk and championing them	AGRM	16-06-2020

Few more webinars are lined up:

Name	Owner	Date
33rd Indian Fellowship webinar	AGP	26-07-2020
33rd Indian Fellowship webinar	AGP	27-07-2020

IAI has taken few strategic decisions to exempt ACET- the entry level entry test for professionals from similar or other Institutions to enable them to become member. Such professionals are already qualified and tested for their abilities and skills and therefore it was a good move by IAI to ease their entry into actuarial Profession.

As a part of wider implementation of the decision, webinars were conducted with the members of Institute of Cost Accountants of India (ICMAI) along with key stakeholders in June 2020. From IAI side, the President, Secretary & Chairperson, Education Committee and Chairperson-Advisory Group on Education addressed the audience. The sessions were attended by a large number of members of respective professional bodies. The session ended with answering queries from the enthusiastic participants. Another webinar with members of their Asia Pacific Cost Accountants also held in a week's time.

A Similar webinar with all key functionaries and members of Insurance Institute of India was held on 6th June 2020 with a large number of attendees. From the

IAI side, the President, Secretary and Chairperson, Advisory group on Education addressed the audience.

Ministry of Corporate Affairs (MCA) issued a Draft Valuer's Bill 2020 which may become the basis for regulation of Valuation professionals in India. Though IAI is an important stake holder of the bill, we were not part of the high level committee which framed the draft format. We constituted a task force with Mr. K Subramaniam as the Chairperson in order to submit the views/ representation of the Institute by Mid of June. Responses shall be submitted to MoF and MCA, Government of India.

The donation to Prime Minister's care fund and also Maharashtra Chief Minister's care fund has not been picked up as expected. This is an extraordinary situation to the country and every citizen has a role and responsibility to play at this crucial juncture. As a profession always stood for public causes to be the first to raise to the occasion and to lead from the front by generous contributions. I urge members to respond to the noble cause by your donation, if you have not already done so.

An advisory group on Actuarial Job Placement has been constituted with an objective of maximising job prospects of actuarial skills and exploring wider field opportunities in the market. Sana Konnor has agreed to chair the group. The group will keep thinking the steps to achieve goals and support implementing solutions to manage placement. They will work to find innovative solutions to connect with potential employers with actuarially skilled resources. I wish the team all the best!

From the examination related front, we have started delivering course materials on the basis of resumption of delivery services in various cities/locations. While it's certain that the June examinations to be postponed, the revised dates are likely to be in September as per the original decision.

Dates of next round of examinations have been announced. Since more than 3 months to go for the upcoming exam, even those who have not started their preparations so far would have a good chance of success, provided utilisation of remaining time.

There are various other developments in pipeline with regard to education support for the interest of students and announcement for them shall be made in due course.

IAI has announced elections to the Council against 4 vacancies arising out of retirement due in September 2020. I urge more and more enthusiastic actuaries to contest election who can devote time to the profession in strategy formulation and decision making as council members to participate in this democratic process.

I would like to now sign off and come back and share more development.

UPCOMING WEBINARS

Webinar	Date	Time (IST)	CPD	Members
Webinar on Pricing of Crop Insurance	26th June, 2020	1600-1730	1.5 hrs (Technical-GI)	Members & Non-members
Presidential TownHall Meeting with Students	28th June, 2020	1100-1200	Non CPD Event	Students
Webinar On Adapting to trends in Life Insurance	1st July, 2020	1000-1200	2 hrs (Technical–LI)	Members & Non-members
Tech Talk on Compensated Absences and other long term Employee Benefits	9th July, 2020	1700-1800	Non CPD Event	Student, Associates & Non-Members

From Chief Editor's Desk

Ms. Bhavna Verma

Greetings to all the readers of Actuary India! I hope most people are reading this from the safety of their homes and have by now, adapted to the 'new world', a phrase we use and hear a lot these days. New world or old, time does seem to fly by nevertheless. We are nearing the end of the first quarter of the new financial year which is likely to be quite a different one, if early experience is anything to go by!

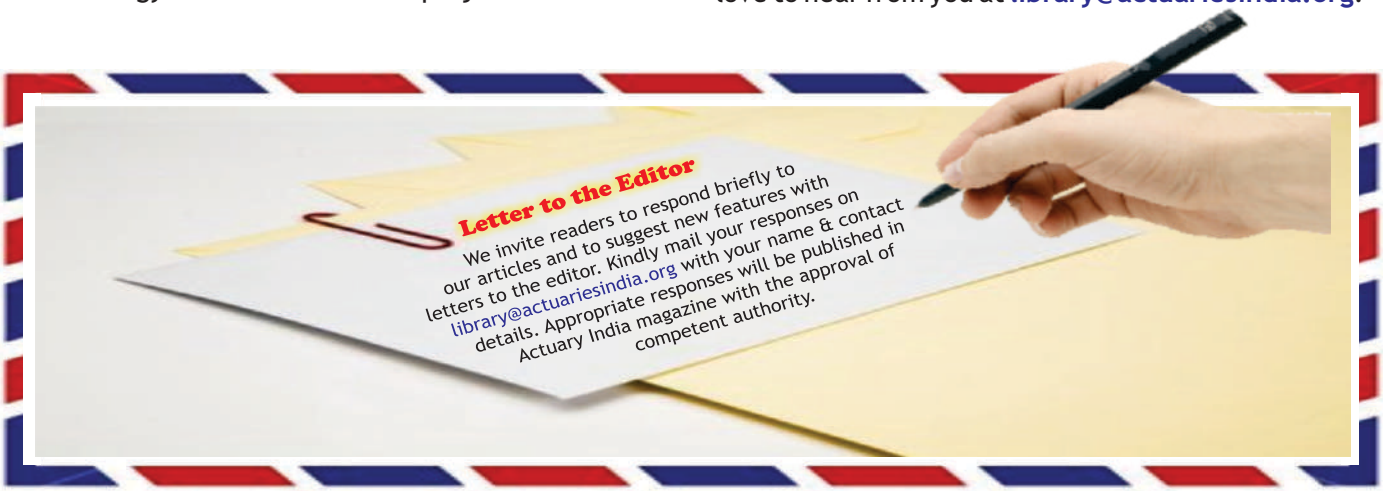
Business figures for life insurers for the first 2 months (until May 2020) evidently show the initial struggle of the industry to adapt its ways and means to a socially distanced world. This throws up opportunities and challenges for the key actuarial function as well to develop mechanisms and lead innovation to keep the growth momentum going; continuing volatility in investment markets and uncertainty around economic growth does not make this task any lighter. General insurance, on the other hand, is expected to see mixed demand driven sales trends and claim trends across business portfolios with risk management in portfolios such as health insurance becoming paramount. I believe events such as Covid-19 occurrence also provide rare insights for organizations to proactively push multi-disciplinary teams which challenge conventional wisdom and comfort zones.

Aligned with attempts by several actuarial bodies around the world to produce research which can provide useful information and enable decision making in these trying times, a Pandemic Research Group constituted by the Institute of Actuaries of India released a report in May 2020 (available on the Institute website) describing the assumptions, methodology and results of projection models

developed to estimate Covid-19 cases in the country under various scenarios.

Among others, this issue of the magazine includes features on epidemic modelling and thoughts of our fellow community members on likely impacts of Covid-19 on different areas of actuarial work and business. Time-efficient webinars have become the preferred medium of knowledge sharing by the profession. Reportages of recently held webinars; COVID-19 in India: An Actuarial Perspective, Data Science & Analytics and Retirement Benefits are also included in the issue. I see an interesting line-up of events in the coming weeks as well.

Stay safe and keep learning! I wish you find opportunities in the adversity, calm in the chaos and your own effective new normal. As always, we would love to hear from you at **library@actuariesindia.org**.



1st Webinar on Retirement Benefits

Date: 8 May 2020; Friday Time: 16:00 - 18:00 IST

Chair: Mr. Kulin Patel, PEBSS Advisory Group

Moderator: Ms. Preeti Chandrashekhar, Wealth Leader at Mercer Consulting India

Speakers: Mr. Jenil Shah, Partner Kapadia Actuaries & Consultants,
Mr. Ritobrata Sarkar, Consulting Retirement Leader, Willis Towers Watson India &
Mr. Sanjeev Singhal, Vice Chairman, Accounting Standards Board, ICAI.

Introduction

A webinar titled "The Pension Actuary and COVID19" was conducted by Advisory Group on Pension, Employee benefits and Social Security (PEBSS) on May 8. Mr. Kulin Patel started the session by providing his observations of COVID19 impacts on various aspects of retirement savings plans across the globe. Mr. Ritobrata Sarkar, Mr. Sanjeev Singhal and Ms. Preeti Chandrashekhar discussed about the practical challenges being faced in 2020 year-end Employee Benefits Valuations due to COVID19 especially in respect of Setting of key Assumptions. The Webinar concluded with Mr. Jenil Shah discussing about the way they have managed work amidst the lockdown, the key learning outcomes from the prevailing situation and the areas consultants should explore to expand and diversify their work domain.

Effects of COVID-19

The Webinar started with an introduction to the topic. Due to the pandemic, there has been economic turmoil around the globe affecting equity markets, bond markets etc. This has in turn affected the funding ratios and asset allocation in pension plans. Also, employers and employees both have been seriously affected. Governments worldwide have introduced initiatives to help both the employers and employees such as the CARES ACT in the US, UK's Coronavirus furlough scheme etc. In India, Employees' Provident Fund Organisation (EPFO) has relaxed withdrawal rules to help members and employers, Pension Fund Regulatory and Development Authority (PFRDA) has included Coronavirus ailments in its definition of medical conditions when applying for partial withdrawals and for Atal Pension Yojana (APY) subscribers, an option to defer contributions until June 2020.

Building Blocks for Actuarial Valuations and the challenges being faced

The focus of the session was on the two main building blocks of actuarial valuations - Assumptions and Plan Provisions. Ms. Preeti opened a poll question for the audience seeking their experience regarding the change in discussions pertaining to actuarial assumptions with the clients due to COVID 19. The poll results revealed that around 55% of the attendees experienced a change in the discussions with clients to some extent whereas 38% experienced significant change. The session kick started with Mr. Sanjeev Singhal highlighting the importance of challenging the salary escalation rate assumption amidst the COVID 19 situation. He also mentioned regarding the general increasing trend in attrition rates due to the layoffs. Mr. Ritobrata dwelled on the aspects regarding the assumptions that one needs to consider as a practitioner. He mentioned that a segmented year wise salary escalation assumption will help practitioners take into effect the impact of COVID 19 appropriately. One reason for not being able to consider the impact of the current situation into the valuation could be that the valuation process started way before the announcement of the lockdown and both clients and practitioners were not absolutely sure of what lies ahead. Also, while considering Salary Escalation Rate, it is important to take into account whether the pay cuts are temporary and if so, then when will it restore back to the current salary level. For Attrition Rate, he further emphasized on the fact that although the rates have increased due to the layoffs, voluntary withdrawals will significantly reduce due to the uncertainty prevailing in the job market. When discussing the significance of Actuarial Gains and Losses due to experience, Ms. Preeti rightly mentioned that it is a good indicator for assessing whether the actuarial assumptions being used, need to be re-evaluated or not.

For the plan provisions part, it was stated that the nuances and specifics of the benefit schemes would

help determine whether the benefit should be recognized as a Post-Employment Benefit or Other Long Term Benefit which then led to a discussion on the recognition of Exempt Provident Fund.

Life amid COVID 19 - A Practitioner's View

With the lockdown being announced from 25th March, there were some issues to ponder over such as how would work be managed, how to communicate with team members and clients etc. and the answer for most of these uncertainties was the advanced technology at hand. Technology has enabled us to work efficiently and meet client deliverables.

Areas to expand and diversify work domain

For expanding work domain, Assumptions and Experience Analysis should be conducted as they would help in understanding the past trend which is a good indicator for the future.

Also, Employee Benefit Valuations should be conducted more frequently (every quarter or at least biannually) which would enable companies to understand their position on Benefit Obligations and thereby would be well-equipped for the movement before the next year-end.

In order to diversify work domain, the following can be considered:

1) Valuations other than Employee Benefits – Brand Valuation, Warranty Valuation, Expected Credit Loss (ECL) etc.
2) ESOP Consulting
3) Insurance consulting to corporates.

Key Take-aways

The lockdown due to the pandemic has affected the global economy and to survive through this phase, many companies have decided to go for no salary increments, deferred salary increments, pay-cuts, lay-offs, etc.

It is important that we as actuaries take into consideration all such factors while setting assumptions for actuarial valuations. Assumptions and Experience Analysis are very essential to get a clear picture regarding the past trends.

It is important that we as actuaries take into consideration all such factors while setting assumptions for actuarial valuations. Assumptions and Experience Analysis are very essential to get a clear picture regarding the past trends. This would also help auditors to have a basis to refer to and provide more clarity. COVID19 has caused major disruptions throughout the economic and business cycles and we need to be prepared for what lies ahead.

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4th Webinar on Data Science & Analytics

Day 1 Date: 22 May 2020; Friday Time: 15:00 - 16:30 IST

Chair: Heerak Basu, Chair, AGDSA

Moderator: Mahidhara Davangere V: Secretary, AGDSA

Speakers: Michael Tripp, FIA Partner, Mazers, UK
Sandip Patil, FSA, CERA Director & Lead Actuary, Spraoi.

Introduction

The webinar titled '4th webinar on Data science & analytics' was conducted by the IAI. The two parts of the webinar discussed Data Science and its implication on General Insurance Actuaries by Michael Tripp and Data analytics used in global industry by Sandip Patil.

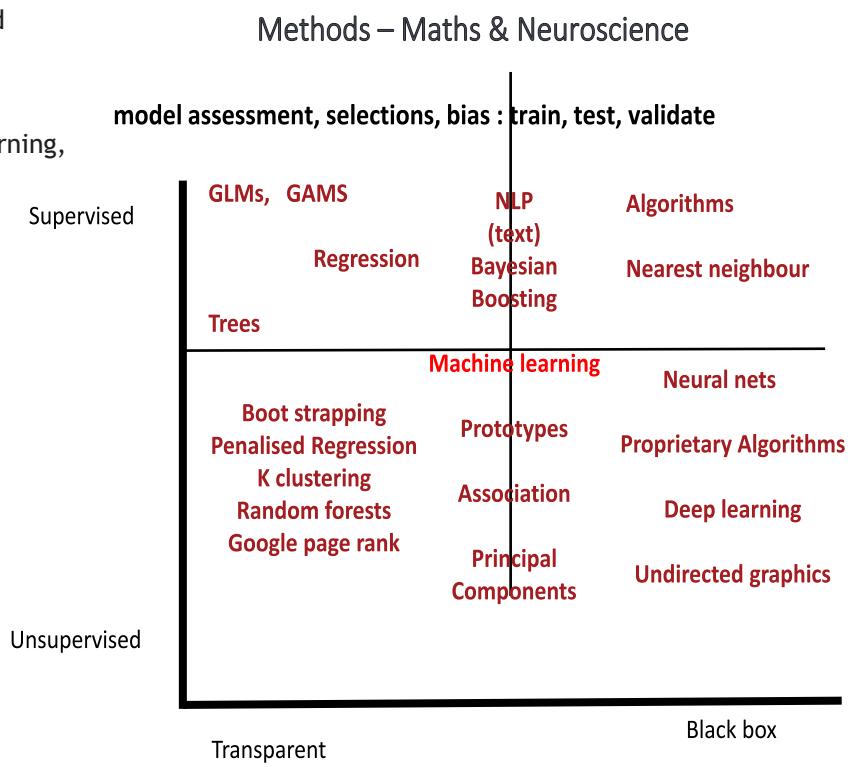
Data Science and its implication on general insurance actuaries

Michael Tripp is a veteran actuary practicing in the UK and has experience in consulting and core insurance. He emphasized that data science and analytics should be used in the insurance and actuarial fields. His discussion was majorly based on two aspects of professional growth of the insurance/actuarial field involving:

a. the use of technology (data science) and
b. involvement of human factor (ethics)

He also discussed supervised and unsupervised learning with help of a graph by placing various data analytics techniques into:

a. Y-axis: supervised and unsupervised learning, and
b. X-axis: transparent (knowing all the explanatory variables in advance) and black box (explanatory variables not known in advance).



As actuaries, we have to accept and embrace that with new and advanced technologies, computers can compute more accurately and efficiently than ever before. With the use of tools like data analytics and artificial intelligence, the industry is heading towards automation.

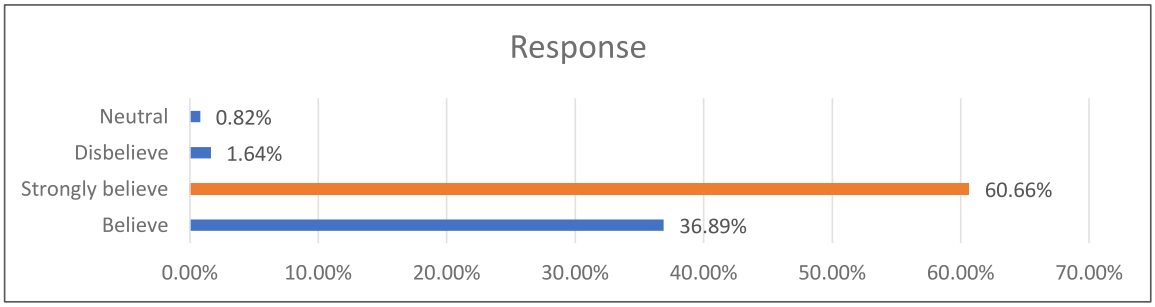
As professionals and actuaries, ethical standards should be considered while choosing models to be applied to data. The responsibility of the outcomes of the model are ultimately the responsibility of the modeller. Modelling can be delegated to technology and AI, however, they have certain limitations. The philosophical parameters, the free will and the intentions is where the judgment of the actuary needs to be used (while assigning the work to technology) to make the world a better place.

Society looks upon actuaries because of their robust professional standards and work based upon an objective mathematical backing. The work of actuaries is not only about mathematical techniques but also about ethics and human behaviours, as the work done impacts the society as a whole. Michael concluded with *"Embrace Learn Adapt and use human powers above it."*

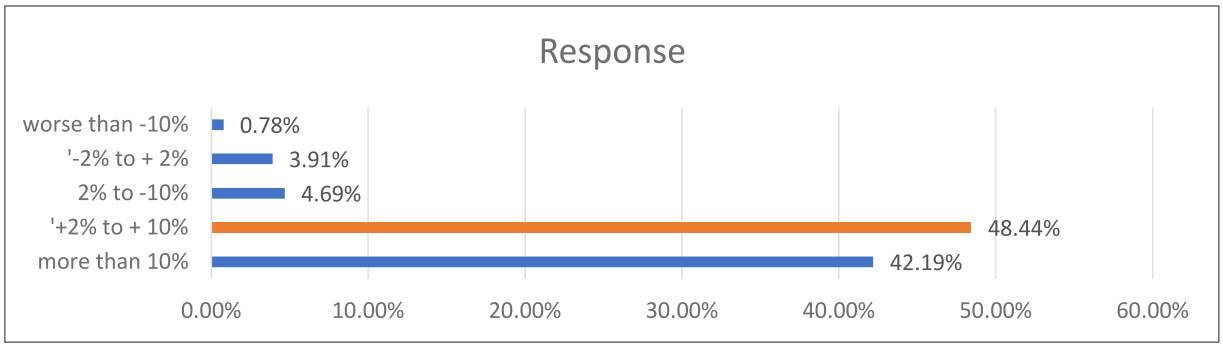
Later, questions from the audience were answered.

Poll Questions

1. Do you believe the IAI and IFoA need to do more work in the data science arena? (Eg education, CPD, research) (Single Choice)



2. What will the demand be for actuaries in 10 years' time (Single Choice)



Data analytics used in life insurance

Sandip Patil has extensive experience in Insurance and Insurtech consulting, while developing and delivering complex and cutting-edge solutions. He discussed about various topics, including:

a. The direction where the global industry in terms of data science and analytics is headed.
b. Key factors affecting the decisions and outcomes of various challenges faced by the insurance industry, it being new to data science.
c. How competition among industries such as insurance and banking are encouraging them to use new data science tools.
d. Emerging technologies in Insurance
e. Examples of models such as

   a. those around fraud detection,
   b. chatbots for websites and
   c. using learning algorithms to segregate class of customers based upon required criterion like their credit ratings
   d. how to make potential sales on a particular class of customers known as *Marketing Lead Generation*.

Companies are now looking at a larger quantity of data for analysing trends, as much more data can be processed in lesser time due to advancements in technology. Data science is being used for developing policy recommendations for each customer by looking at the requirements of an individual and recommending a product suited to that particular customer. Sandip also talked about an end to end approach to a data analytics solution where in an entity should:

- HYPOTHESIZE (identify the problem)
- ANALYZE (what resources like data are available)
- COMPUTE (draft and iteratively adjust the model)

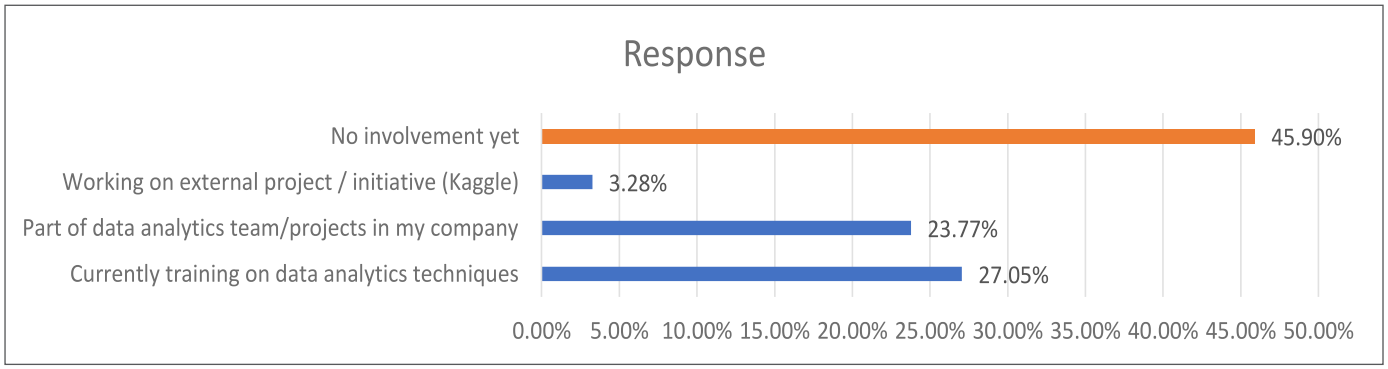
- ENGAGE (apply the model on real data under real world circumstances)
- LEARN (learn from the experience and apply outcomes in models to improve the model).

In another example, he discussed the use of *Natural language processing* to classify the customers worth pursuing for business and the strategies needed to be incorporated in public dealings to improve business. Large number of variables (~1600) were used in this method which can be processed using data science techniques.

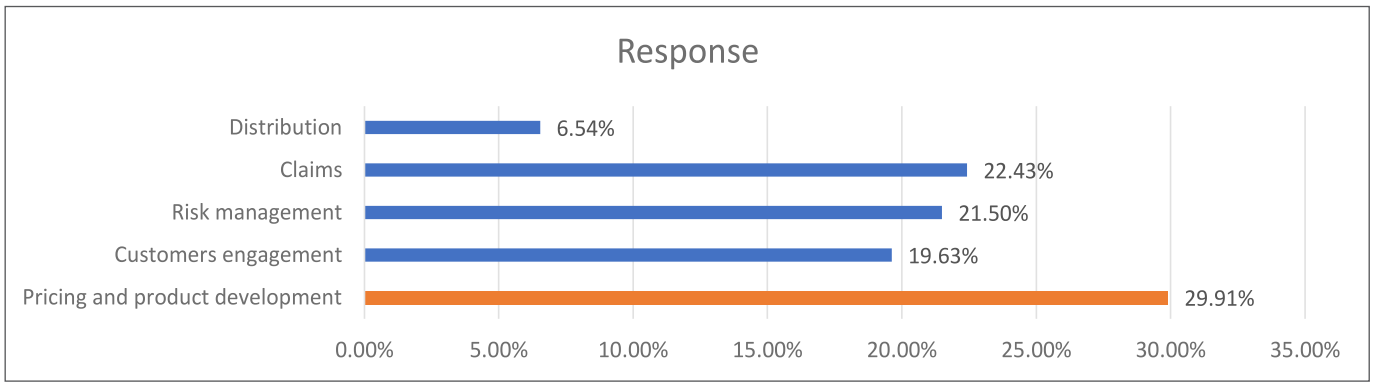
He concluded that problems that are prevailing among various industries can be solved with cloud computing technology and deep learning techniques which need to be adopted in the rapidly digitalizing world.

Poll Questions

1. How are you currently involved in data analytics?



2. In your company, which area has most deployments of data analytics initiatives?



Thank you

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5th Webinar on Data Science & Analytics

Day 2 Date: 23 May 2020; Saturday Time: 15:00 - 16:30 IST

Panellists: Danny Quant, Principal Actuary, Milliman, UK
Valerie du Preez, MD, Dupro, UK
Shailesh Dhuri, ED, Decimal Points, India
Xavier Maréchal, CEO, Reacfin, Belgium

Impact of Technology and data science on business post Covid-19

It was Saturday afternoon, on 23rd May as we settled down to attend the panel discussion hosted by Mahidhara Davangere. This webinar is one amongst a series of webinars organised by IAI to help us continue our professional development during lockdown, while also providing valuable insights on how COVID-19 might impact the work of actuaries.

After an introduction by Heerak Basu and a welcome note by Sunil Sharma, the panellists' views were sought on the macro level changes expected due to COVID-19.

Valerie explained that regulatory requirements not related to COVID-19 are being deprioritised. Bank of England is expected to become a data centric regulator. Data Science and Machine Learning are currently helping fight the pandemic through contact tracing, screening etc. Mundane tasks are expected to be automated, creating greater efficiencies in actuarial functioning.

Xavier discussed that Europe expects large increase in unemployment, fall in equities, volatility in interest rates and fall in the value of assets. Decrease in premium income due to increase in lapses and lower new business is expected. A second order impact on mortality due to lack of access to medical treatments for other ailments is likely. In non-life, certain lines of business may have higher claims, for example, 'loss of wages' product. Others, like motor or worker compensation, may experience lower claims.

Further systematic changes might be expected. There might be increased cyber risk and data breach risk as working from home becomes necessary. Implementation of digitalisation is likely to speed-up.

He expects (and poll results also corroborated) that the highest impact of COVID-19 will be on the assets, followed by health claims, life claims and the least impact on non-life claims.

Danny asked us to consider how might the volatility have changed in the UK market compared to last 15 years. 56% of us thought it would have increased 10%, 25% thought it might have gone down and only 20% thought it might have increased by 1%. In fact, 20% were correct. Over time, there are various crises that impact markets, and therefore in the long term, the impact is not expected to be high. In fact, the current low levels in markets, might be an investment opportunity for long term investors.

He also discussed that while calculations may be automated, judgement and insight that actuaries provide will remain valuable even as use of Artificial Intelligence (AI) increases.

Shailesh explained that there has been a reduction in Gross Domestic Product (GDP) due to the restrictions, with the cities being more impacted than the villages. Within the cities, the effect of lockdown is the highest on the lower income strata. He expects a second wave of the pandemic in India around monsoon, and in US/Europe in winter. He noted that the current scenario has led to a huge influx of orders for data analytics and greater access to talent pool.

In response to the moderator's question on whether there is any need for insurers to review coverage and premiums due to the impact of COVID-19, Xavier opined that there probably is, and that data science techniques might facilitate this.

The discussion then moved to what role technology might play in the current environment.

Shailesh explained how COVID-19 forced many businesses to review their strategy in the last 4 months. Due to need for isolation value of digital assets is rising. Technology is helping in carrying on the business digitally and in transforming the business under the new scenario. Valerie stressed the need to understand the business while applying data science rather than blindly following models. Time saved by automating manual tasks can be used to drive value and strategy. Professional training

should be used to validate the results and ensure trust can be placed on the proposed solution.

Danny discussed the retired individual's dilemma of how much to draw down from her retirement fund. Data Science and AI can come in handy in providing customized solutions to individuals, taking their circumstances into account.

Xavier discussed that data science can play a role in non-life insurance through personalised product development, sophisticated pricing, individualised underwriting and claims processing. While technology can help build models, actuaries and data scientists should work together in understanding and interpreting the results.

Overall, it was a very thought-provoking discussion by the panellists leaving the audience with many aspects to ponder. One of the key take-aways was that it is imperative that actuaries leverage technology to automate tasks, and invest their time in understanding, interpreting, and communicating results to build trust and value. A Saturday afternoon very well spent indeed.

Written by

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Megha Garg is a consulting actuary with 10+ years post qualification experience.

CALL FOR ARTICLES

Institute of Actuaries of India

We invite articles from the members and non members with subject area being issues related to actuarial field, developments in the field and other related topics which are beneficial for the students of the institute.

The font size of the article ought to be 9.5. Also request you **to mark one or two sentences that represents gist of the article.** We will place it as **'break-out' box** as it will improve readability. Also it will be great help if you can suggest some **pictures that can be used with the article, just to make it attractive.** Articles should be original and not previously published. All the articles published in the magazine are guided by **EDITORIAL POLICY of the Institute.** The guidelines and cut-off date for submitting the articles are available at http://actuariesindia.org.in/subMenu.aspx?id=106&val=submit_article

Webinar on "COVID-19 in India: An Actuarial Perspective"

Date: 26 May 2020; Tuesday **Time:** 10:30 - 12:00 IST

Chair: Heerak Basu, Pandemic Research Group (the 'Group') for COVID-19

Invitee: Sunil Sharma, President, IAI

Moderator: Kailash Mittal

Speakers: Kailash Mittal, Tanay Chandra, Archana Anoor, Palash Shah, Abhijit Pal, Megha Garg, Swati Gupta, Manish Sen

Introduction

Institute of Actuaries of India (IAI) has constituted a Pandemic Research Group (the 'Group') for COVID-19. A webinar titled "COVID-19 in India: An Actuarial Perspective" was conducted by the Group on May 26, 2020. The webinar covered a study on development of COVID-19 in different countries across the globe, usage of multi-state models to project cases and measures adopted by insurers across various geographies to soften the impact of COVID-19 and steps that Indian insurers can consider. The webinar kick started with an introductory session by Sunil Sharma, Heerak Basu and Kailash Mittal.

Learning from Overseas

Tanay Chandra put COVID-19 in perspective by sharing statistics on development of COVID-19. Since the reporting of the first case in China, COVID-19 has affected more than 200 countries with around 5.5 million confirmed cases and around 3 lakh deaths. He furnished facts on development of COVID-19 in Italy, Singapore and Germany mentioning about the confirmed, active, death and recovered cases. Archana Anoor spoke about development of COVID-19 in South Korea, USA, Sweden, UK and China. The speakers provided insights on Case Fatality Rate (CFR) and how some countries managed to flatten the curve by measures like aggressive contact tracing adopted by Singapore and also the possibility of resurgence in China. Archana mentioned that in South Korea, patient no. 31 is known as 'Super Spreader', as she is believed to have infected around 45% of the total cases confirmed as on date. Compared to other countries, India cannot afford to stress its healthcare system which is one of the objectives of the lockdown and social distancing protocols. The government should use data and technology to trace cases and ensure rapid testing to contain the spread.

Model and Projections

Kailash Mittal started this section by mentioning the objective of understanding the emerging pattern around the spread of COVID-19 pandemic with an eventual outcome of having a view on the expected number of cases and deaths and recoveries over the next two months. For this purpose, the group focused on two multi-state models: HIRD and SEIR.

Palash Shah spoke about the HIRD model, which covers healthy, infected, recovered, dead states. The model was calibrated using the data for COVID-19 in India from February 29, 2020 to April 14, 2020. He further explained about the state transition probabilities and the estimation of parameters. The expected results from the model were tested against the actual cases for the period from April 15, 2020 to May 10, 2020. Basis this the model fit was concluded to be reasonable. Abhijit Pal spoke about the other multi-state model, SEIR. The states considered were susceptible, exposed, infected, quarantined, recovered and death. The model was fitted using the actual data until April 20, 2020 and validated against actual data until May 10, 2020. Both the models, HIRD and SEIR, were calibrated assuming the recovered cases were not being infected again. Megha Garg established that HIRD model was used for final projection of cases as it provides more flexibility in projecting multiple scenarios. The SEIR model was used for performing sense checks on the projected cases. She further mentioned that the cases were projected for 4 different scenarios, each with varying level of social distancing and lockdown norms followed by the Indian citizens. Kailash Mittal continued the session by providing detail about how the expected numbers from the model stack up against the actual numbers. The actual versus expected ratio for the projected results generated by the Pandemic Research Group for active and confirmed cases, for the period from April 21, 2020 to May 25, 2020, using the

HIRD model has been with the range of +/- 5% corridor. (Refer fig. 1.1)

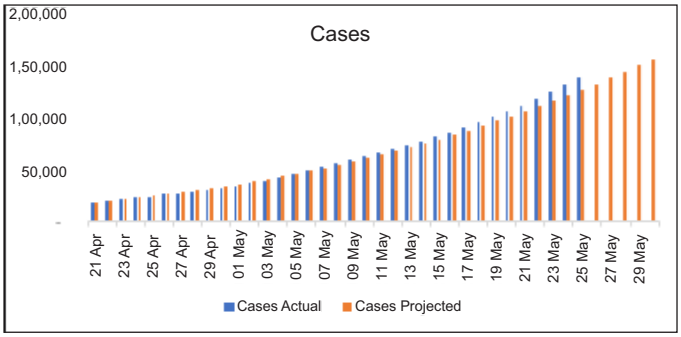
Products: Global Trends and Coverage

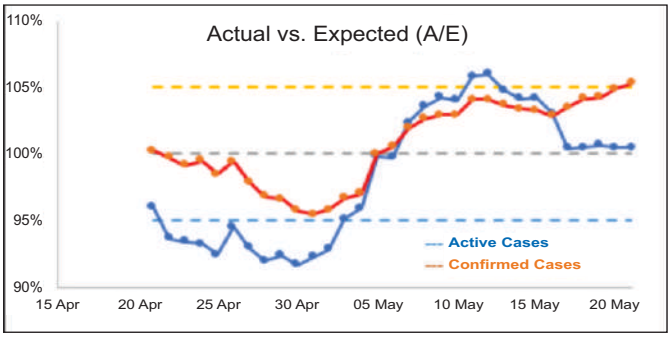
Swati Gupta provided insight on some notable global trends in the insurance industry with attention on USA, China and Italy. She spoke about premium rebates and waiver of cost sharing on medi-claim type plans provided by insurers in USA. She further added that in some countries, discounts and extensions have been offered for motor insurance because of people driving less. Swati Gupta also gave a perception on the possible steps that Indian life insurers can undertake concerning the product design, product options and pricing and reinsurance strategies along with the challenges that insurers might have to tackle.

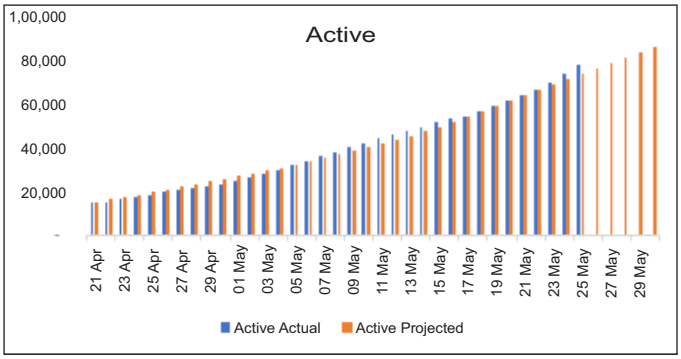
Manish Sen added to this section by throwing light on various ways in which non-life insurers can re-visit the product options and underwriting process. Insurers should explore options for tele-verification and tele-medical underwriting to overcome the barriers created by lock-down. He also mentioned about some of the salient steps that Insurance Regulatory and Development Authority of India (IRDAI) took like extension of grace period, exclusion of force-majeure clause for COVID-19 related death claims and fast track approval for COVID19 specific products. He concluded by mentioning about COVID-19 related covers offered by some of the Indian insurers.

The webinar concluded with Sunil Sharma acknowledging the work done by the Pandemic Research Group and extending appreciation to each of the members of the Group.

Figure 1.1:







Full report of the Pandemic Research Group is available on the IAI website

Written by

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Vatsal Shah is a student member of IAI and currently working as a Deputy Manager with Deloitte Touche Tohmatsu India LLP.

LIC of India IPO - Cracking the Conundrum

The announcement came in the Budget speech of 2020, there were some rumblings for the past few years, but few had anticipated that it would come in this manner.

"Listing of companies on the stock exchanges discipline a company and provides access to financial markets and unlocks its value. It also gives an opportunity for retail investors to participate in the wealth so created. The Govt. now proposes to sell a part of its holding in LIC by way of an Initial Public Offer." Finance Minister in the budget speech.

The media hype that followed the announcement was on the expected lines, highlighting the size, scale and complexity of the exercise; some pitching it to rival the Aramco mega IPO when it came. Hence the speculations around the size of the valuation and the timing.

The Ministry insisted that 2nd half of FY 21 was a likely time line, even though it required an amendment to the LIC Act, converting LIC to a company under the Companies Act, seeking regulatory approval etc. Analysts suggested this was ambitious; SBI Life Initial Public Offering (IPO) took nearly 9-12 months to prepare the Embedded Value Report and get necessary approvals and SBI Life was nowhere near LIC in terms of scale and complexity.

There were speculations regarding the likely valuation of LIC. The government indicated that LIC IPO would be a key component of the target ₹2 lakh crore disinvestment plan for FY 21. The indications that came were that a 10% dilution would yield the government an amount of around ₹0.8 to ₹1.2 lakh crore. There was also a suggestion from another quarter of ₹20 lakh crore as a likely valuation for LIC.

This line of thinking seemed to have come from a comparison with the other listed life insurance entities. If LIC's AUM was around 20 times that of SBI Life's, given the latter's market cap, the former would be valued at ₹10-12 lakh crore.

Not everybody agreed to this given as the argument went, LIC's structure entailed a 5% surplus attribution to the shareholders. Theoretically, EV could be the present value of this future profit cash flow plus the net worth. If that be around ₹25,000 to ₹50,000 Cr and the market supported 3-5 times the EV as the valuation, it would fall way short of the earlier estimates.

What we set out to do and what follows from here on is an overview of the current structure of LIC as it has been historically set up and the constituent value (shareholder interest) components. The pooling of funds and the 95/5 sharing of surplus have implications on the extent of ownership of these components. We will then look at a possible restructuring or a reworking of the current structure, thereby exploring a crystallization of the ownership by way of an acceptable governance process. Having done that we will aim at a rough estimation of its valuation. The restructuring is of much more consequence as we will see later, thereby the focus of the thought processes would be on the latter.

Pooling, Life Fund & Ownership

Many aspects of LIC's business is governed by the LIC Act 1956. LIC's capital requirement of ₹5 Cr was amended in 2011 to ₹100 Cr. Sec 28 of LIC Act stipulated that 95% of (all) surplus emerging will be allocated to the with profits or participating policyholders. Even though this was amended to 90%, LIC is magnanimous and continues to allocate 95% of the surplus to the policyholders.

Historically, LIC has been and remains a big pooled fund called the Life Fund or the Long Term Fund. De jure, the Life Fund and thereby all surplus emerging out of it belong to the with profits policyholders to the extent of 95%. This includes all the non-profits (ULIPs included) funds or businesses that sit within the pooled fund, where the with profits policyholders claim 95% ownership to their profits. A glance at the revenue statement of LIC indicates that the profits/losses of business segments other than the participating, are entirely moved to the participating business.

This is in sharp contrast to the other private companies which mostly operate lines of business which are entirely owned by the shareholders. In LIC hence, apart from the shareholder fund, pretty much everything else is majorly

owned by the participating policyholders, leaving the shareholders with a claim to the residual 5%.

Asset & Liability

Dig deeper and we will unearth further complications within the big pooled fund.

In a fair value, market consistent world, the assets are required to be valued at the market prices if traded, or a reasoned estimate of what it would have been if it had been traded at that time.

A market consistent liability would consist of a best estimate liability and a risk margin. The former typically is the present value of the expected future cash flows, discounted using the risk free rate. The Risk Margin represents the theoretical compensation for the risk of the future experience being worse than the best estimate; the cost of holding capital for risks that cannot be hedged. It is calculated by projecting forward the future risk capital that is required to be held during the run off of the existing business.

Best Estimate liability and the Risk Margin together constitute a fair value price of the liability if there was an arm's length transaction.

While Non-Par policy benefits are mostly fixed in nature, thereby the future cash flows are also fixed, there are very specific considerations around the participating policies.

The obligation to the in-force participating policyholders would take into account both the policy benefits by way of contractual obligations already vested as well as a fiduciary duty to meet future policy benefit obligations that fulfil their (policyholders') expectations in a well-defined or reasonable manner. While there are legal uncertainties around the definition of 'reasonable', a broad agreement exists within the actuarial profession that it should be based on 'asset-share'. A degree of actuarial discretion is inherent in the calculation of the asset-share and its application to decide future benefits to participating policyholders; there may be a documented internal policy around this, past practices, statements made, indications given in the past to these policyholders or an adoption of global best practices may help navigate this issue.

The reasonable expectation would typically include a share of the surrender profits, a share of profits from non-profit business written within the fund etc. It would also include an entitlement to the full asset-share or something very close to the full amount; albeit a degree of smoothing ensuring some protection from the volatility from market returns.

The asset-share would then be a fair representation of the best estimate liability of the participating policies.

Residual (Excess) Surplus

The excess of the fair value of assets over liability defined in the above manner is often called estate or 'inherited estate'. It is not unusual for large legacy with profits companies across the globe to have carried sizable estates. Why should there be an excess?

A participating policy typically pays out at maturity, all premiums net of actual expenses and claims accumulated at the pooled rate of investment return earned over its term. This amount is referred to as 'asset-share' and is fundamental in deciding an equitable pay-out at maturity or for that matter at earlier surrender. Such equity is achieved by allocating regular bonuses during the term of the policy and a final bonus at maturity.

- One source of estate is capital injected by the shareholders into the life fund, which is not the case here.
- Often, the estate may well be, largely or wholly, a result of past, now terminated participating policyholders receiving less than the asset-shares, e.g.
    - Prudence may have led to pay-outs being smoothed well below asset-share levels
    - Lack of the necessary wherewithal at earlier times to track asset-share; company may have wished to err on the side of underpayment if the systems for asset-share or bonus rates were inadequate.
    - Surrender profits and profits from non-profit products not credited to asset-share
    - Inability or simply unwillingness to pass on unrealized gains on equity and property
    - Besides, merger of the erstwhile private companies into LIC in 1956 may have created surplus at that time.

There have also been several occasions in the past where instances of insouciance on the part of the Corporation may have led to drawdown of the estate. Some of the instances could be:

- Guaranteed addition life and guaranteed deferred pension products sold during early part of 2000 decade, where the pay outs were too far out of line with the then available market yields.
- Gratuity / superannuation rates to corporate clients in the past have often been much higher than the underlying earnings on funds.
- Annuities often continued to be sold in large volumes subsequent to sharp decline in interest rates before re-pricing them.

Estate Reattribution

Who does the estate belong to?

The question of what rights the policyholders have in the inherited estate has often been the subject of heated discussion within the actuarial profession and in other interest groups. In the end there is no single answer! There are only divergent points of view:

- The estate is of course surplus, and to distribute part of it to shareholders in any other manner is inconsistent with the basic with profits principles, which requires 90% (95% for LIC) of the distribution to be to the policyholders.
- Equity is nor served by transferring undistributed profits from past terminated policies to those now in force and other yet to be written; except in a limited way to achieve an acceptable degree of smoothing of benefits between generations of policies.
- Current participating policyholders as a class, cannot have a right to the estate as there is no requirement to distribute it; if not done (distributed through the reattribution) they would never get it and would eventually exit the fund having received their rightful (normal) benefits.
- Policies have a finite life and on being terminated cease to have any claim whatsoever on the fund. Shares on the other hand have indefinite existence and may carry full rights to residual surplus/estate.

Reattribution is a process under which a firm which carries on with profits business seeks to redefine the rights and interests that the with profits policyholder have over the inherited estate - FCA.

Many of the estates originated many years ago. For LIC, given the lack of historical data and the complexity of its origin and legacy, it can be very difficult to determine the sources of inherited estate with any degree of certainty but a major part of it could have emerged out of past under-distribution.

There are no regulations in India that define or govern the distribution of estate, nor is there precedence to follow. There is however, a few international precedence, particularly in the UK.

UK Regulations:

COBS 20.2.21 (Financial Conduct Authority FCA, UK): At least once a year and whenever a firm is seeking to make a reattribution of its estate, the firm's governing body must determine whether firm's with profits fund has an excess surplus. If the fund has an excess surplus, to retain that surplus would be a breach of Principle 6 (A firm must pay due regard to the interests of its customers and treat them fairly).

COBS 20.2.42 (FCA): A firm that is seeking to make a reattribution of its inherited estate must: (1) first discuss with FCA as part of the determination under COBS 20.2.21 ..... (2) following the discussions referred to in (1), identify at the earliest appropriate point a "policyholder advocate" who is free from conflict of interest..... to negotiate with the firm on behalf of the relevant with profits policyholders..

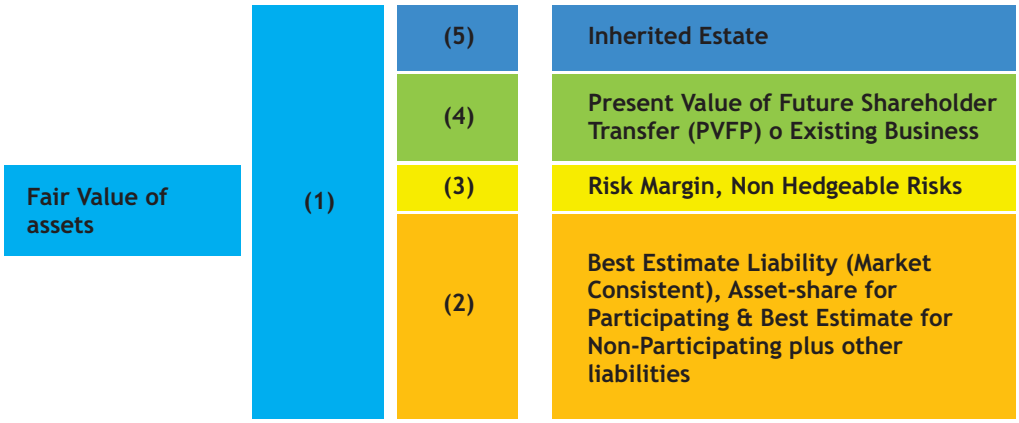

Diagram-1: Composition of the Life Fund (other than the shareholder fund): (1) Fair Value of Assets (2) Backing policyholder obligation (3) Backing policyholder obligation (4) Shareholder value (5) Policyholder (95%) & Shareholder (5%) under normal circumstance.

To conclude, any reattribution exercise (the process of a negotiated buying out the policyholders' interest in the Estate through some legal means) would be in order and that it is fair to the policy holders to be offered a choice. In exchange for a pay out of a fixed amount (PIP, Policyholders' Incentive Payment) now, the policyholders may choose to give up the uncertain prospect of any future more favourable distribution of the estate.

Eventually, the balance of the arguments and a measure of quid pro quo will decide the respective shares between the

two parties. This would follow a complex actuarial/accounting exercise, which 'would' normally require legal / quasi legal oversight and eventually regulatory approval.

A crude estimation

Hereinafter, we look at ways and means of putting numbers to the above boxes and make a rough inference on LIC's overall valuation. Our effort at the valuation would be at best for academic interest, given that it will be based on sample data, subsequent scaling up of the results and on information available in the public domain only.

The other part of the valuation piece is of course the goodwill represented typically in a life company as the value of New Business. We will try and propose some numbers for this as well.

The estimation is based on the publicly available information on assets and liability, assumptions, past bonuses etc.

From Statutory to Realistic Balance Sheet / 31.03.2019

Policy Liability	**Statutory**	**Realistic**
	Cr.	
Individual Par Life & Pension#	21,80,000	20,27,400
Individual Non-par	9,000	8,100
Annuity	60,000	57,000
Group Fund (Gratuity, Superannuation etc.)	4,30,000	4,39,890
Group Term etc.	12,000	9,600
ULIPs	78,000	78,000
Total	**27,69,000**	**26,19,990**
Other Liability		
Current Liabilty	38,336	38,336
Provisions##	17,600	2,657
Total Liability	**28,24,936**	**26,60,983**
Assets exluding the Shareholder fund		
Application of Fund (BS)		31,07,434
MTM Bonds		38,284
Market Value of Assets		**31,45,718**
Future Shareholder Transfer		29,800
Risk Margin###		45,000
Estate		**4,09,935**

Table 2: # Realistic Policy obligation based on asset-share, excluding future shareholder transfer.
14943 Cr, provision towards solvency margin excluded
Risk Margin includes Cost of Guarantee and Cost of Risk Capital with respect to risks that are not hedged. Based on equivalent estimation of other life companies.

- Segment wise segregation of statutory liability is approximate as the financial statements and public disclosures afford limited visibility.
- For participating policies, an excel sheet based simulation was done based on a small representative pool of policies with assumed mix in terms of products, terms and outstanding terms. Asset-share is based on historical market yields for bonds, equity index, policy loans, cash and a long term return on property, on an assumed historical mix of assets. Past regular bonuses are used.
- Bonds are assumed invested for the outstanding term and held to maturity.
- PVFP (Present Value of Future Profits) is estimated based on future shareholder transfer from the current levels of regular bonus continuing into the future and residual transfer as terminal bonus, the latter, whether positive or negative. The future accumulation and discount rate is the risk free forward rates.
- The ratio of asset-share to reserve varies by outstanding term from 40% to 140%, being lower for the recently issued policies. At an aggregate level it works out to 93%
- The model outputs (asset-share, Reserve, PVFP) are scaled up; the model and sample portfolio is calibrated by scaling up the cost of bonus estimated from the model to the actual cost of bonus for FY 2018/19.
- Reserves are based on the currently available reserving assumptions.
- For non-participating business high level adjustment is made to the reserves to turn them into best estimate realistic reserve, based on the nature of the business
- For spread & fee business (Group Funds & ULIPs), the reserves are left at their reported statutory basis levels except for any undistributed unrealized capital on the assets backing the liability in respect of the former, assuming 5% equity backing; which may be argued to be required to back policyholder liability.

Shareholder Interest

We now populate diagram (1) with the estimates to hazard an assessment of the shareholder interest in the business as at 31.03.2019.

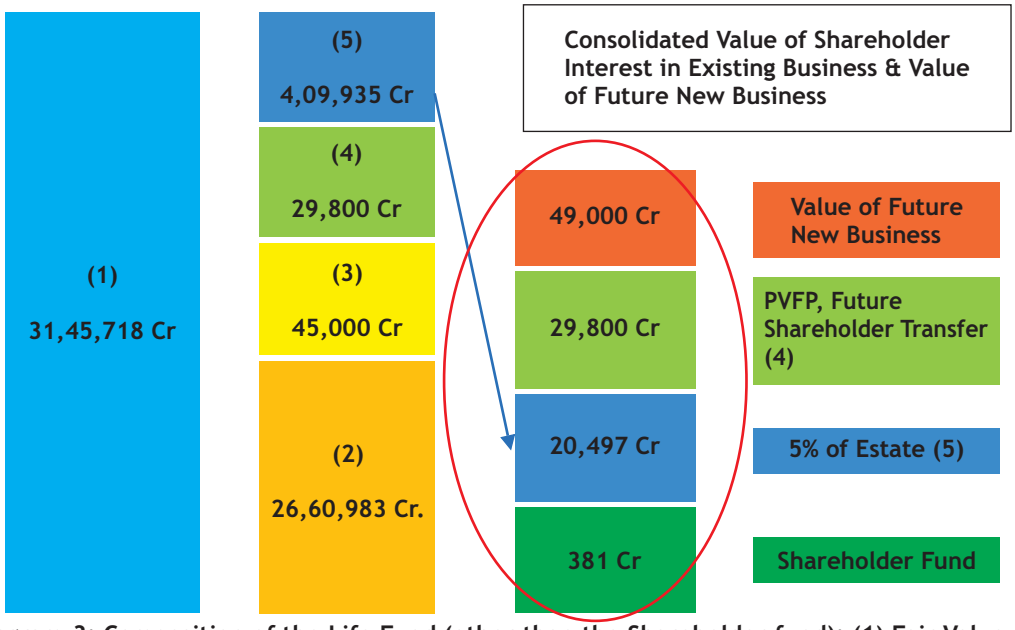

Diagram-3: Composition of the Life Fund (other than the Shareholder fund): (1) Fair Value of assets (2) Realistic Liability (3) Risk Margin for risks that cannot be hedged, includes cost of guarantee specifically for the group fund business (4) Future Shareholder Transfer (PVFP) (5) Estate: Policyholder (95%) & Shareholder (5%) under normal circumstance.

Value of Future New Business FY 2018/19

Segment	New Business APE 2019	Estimated Margin	VONB Cr		VONB Cr	Value of Future New Business
Individual Participating Life & Pension	29050	8%	2324		2,593	49,000
Individual Protection	1500	75%	1125	@5%		
Annuity Individual & Group	1700	30%	510			
Group Accumulation Fund	7650	25%	1912.5			
Group Term/Protection	4600	40%	1840			
Total APE	44,500					
Total NBP	1,44,400					

Diagram-4: (1) NB Margins are typical of the business segment as seen in similar companies
(2) VONB from Non-Participating business will contribute only 5% to the Participating VONB

Assuming 15 years of future New Business, an annual growth of 15% and a risk discount rate of 12%, the multiple works out to 19, giving the value as 49,000 Cr.

To conclude

A reiteration of the earlier caveat that the estimation is approximate, for academic interest only; thereby no claim is made for nor any pretence to any level of accuracy. Judgement is often used in the various workings, this is no substitute for facts and figures.

The market value of the real estate is taken as the book value plus the revaluation; an appropriate valuation if carried out, could see some divergence.

As things stand, the major part of LIC's value would emerge from the estate and significantly as a consequence of reattribution which would be the sine qua non of the larger process.

It should be possible to embark on a fundamental restructuring exercise leading to a segregation of the Life Fund into participating and non-participating business lines, the latter wholly owned by the shareholders; the shareholders would then need to provide the risk capital and compensate the former for the future profits on the latter business lines.

Views expressed are of my own and they do not in any way reflect those of my employer or profession.

Lastly, I acknowledge a discussion paper of 2011 by C D O'Brien titled "Equity between with-profits policyholders and shareholder" - UK actuarial Profession, for some of the thoughts expressed here.

Written by

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Sanjeev Pujari is currently President in SBI Life Insurance Co, overseeing Actuarial, Risk and Product Management functions.

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COVID-19 and Health Insurance

COVID-19 Pandemic has emerged as a Critical Risk which has impacted various industries across the globe. Health Insurance will get impacted directly due to this pandemic and will have varying impact in short, medium and long term.

COVID-19 Pandemic: COVID-19 is the worst health crisis of recent times. One of the main reason for this being so critical is that Coronavirus appears highly transmissible. The transmissibility can be measured by Basic Reproduction Number (R0) which is defined as an expected number of cases directly generated by one case in a population where all individuals are susceptible to infection. The length of incubation period also has influence of R0 among other factors. The R0 rate for COVID-19 is still not known currently but various studies peg it between 2 to 3. Taking an average 2.5 value shows that 60% (1-1/R0) of the population can be infected eventually if no mitigation measures are taken. Case fatality rate (CFR) which reflects the percent of diagnosed people who die from a disease varies widely by countries. High Basic Reproduction Number and Case Fatality Rate make COVID-19 so dreadful and various countries are taking drastic measures to deal with the situation. Some of these measures are unprecedented.

There are following two time-tested mitigation measures to deal with any Pandemic:

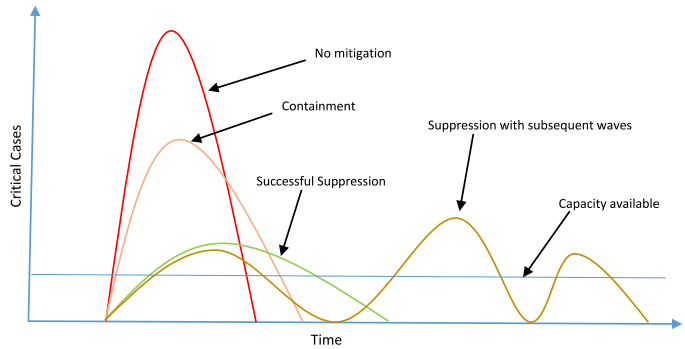
1. Containment of Pandemic
2. Suppression of Pandemic

While the objective of both the methods is to bring down the replication number, they may vary in terms of intensity and duration of measures taken.

1. **Containment of Pandemic:** This involves measures like isolation of known cases, quarantine of symptomatic cases, social distancing by highly susceptible group (e. g. older people), not allowing congregation of large people, closure of public places like, educational institution, cinema, etc. The objective of all these measures is to bring down the Replication Number (R0) but keep it slightly above 1. This may result in more cases in initial months but helps in building herd immunity over medium to long term. The advantage of this measure is that chances of being hit by second and subsequent waves on pandemic are greatly reduced. The disadvantage is that health care facilities may be inundated in the initial few weeks and months by case load resulting in big strain on the available infrastructure and higher case fatality. This measure may not be suitable in case of very deadly disease and where health care infrastructure is poor and inadequate.

2. **Suppression of Pandemic:** This involves much more stringent measure as compared to containment, like complete lockdown of cities, states and entire country for weeks and months. Social distancing is observed by both high and low risk group categories and the areas where there is danger of super spread of disease are completely sealed. The objective of all these measures is to bring down the Replication Number (R0) below 1. The advantage of this measure is that it may help Government to keep case load below the surge critical care bed capacity in the short term and it may ramp up the capacity to handle more critical cases in the medium term. The disadvantage of this measure is that it doesn't provide herd immunity and unless effective vaccine is developed and administered there is danger of second and subsequent waves whenever these stringent restrictions are lifted.

The following graph explains the strategies to deal with pandemic for illustration purpose:



India has adopted second measure to deal with the disease given its vast population, ineffective contact tracing and inadequate surge critical care bed capacity. While building Scenarios for financial projection actuaries should consider these factors and possible prognosis of disease in different scenarios.

We can study the impact of COVID-19 on various important metrics for Health Insurance Portfolio as follows.

Impact on GWP: The impact on GWP for health insurance business can be analysed in two parts, i. e., short term and long term. In the short term the new business for

some of the channels like selling through agents, direct sales team, bancassurance, may get affected adversely due to do measures like social distancing and lockdown while the uptake of digital channels may go up. In the medium to long term there will be higher awareness and propensity to buy health insurance, therefore, ideally the new business through all the channles should increase. The renewal business may see some dip in a very short term but should recover soon. Therefore, due to COVID-19 the relevance of health insurance will go up but due to restrictions on face-to-face meeting insurance companies should device mechanism to procure business through digital means even in traditional channels.

Impact on Claims: Any Pandemic by very nature of it will impact the claims of health insurance portfolio in a very big way. The situation today is a bit tricky and we can study the impact on claims incurred and consequently loss ratio due to COVID-19 under the following heads:

a. Avoided Claims – Saving in Claims: In case of lockdown, social distancing and fear of hospital induced infection some people may avoid hospitalisation altogether. These claims can be for diseases like, gastroenteritis, high grade fever, etc. Also the OPD in most of the hospital is closed and therefore the conversion from OPD to IPD will not be there. The claims related to accident will reduce due to much reduced mobility. These are permanent saving in claim cost.

b. Emergency Claims – No change: Claims for admission for reasons like heart attack, stroke, etc. will not be impacted by COVID-19 spread.

c. Elective Surgeries - Deferral: Some of the surgical procedures like Cataracts, Knee replacement, etc. can be deferred and therefore may shift from lockdown period to when situation become normal. This may have impact on our assumption of uniform earning of exposure.

d. Claims for treatment of COVID-19 – Additional Claims: This is the most important part of claim forecast and there are challenges regarding availability of data for the disease and varying experience of spread of pandemic in different countries. Actuaries should use different scenarios regarding the trajectory the disease can take by varying Basic Reproduction Number (R0). This should give the probable infected population in the country. The range of scenarios may include optimistic scenario like where vaccine is developed fairly quickly to apocalyptic scenario where large part of the country is infected before herd immunity is developed.

   If a particular insurance company has major presence in specific geography or customer segment, the relevant adjustment can be made to arrive at total infected lives under portfolio. The next step is to multiply the infected portfolio under each scenario with admission rate by age in infected population for which experience of other countries is available. Care is to be taken while applying age wise admission rate (from other geographies) as to whether these are rates on total infected population or symptomatic population and accordingly adjustment needs to be made. There can also be a limit imposed on number of claims due to overall capacity constraints in the health care infrastructure in the country. Estimation of average claim size will be impacted by the proportion of public and private hospital and critical and non-critical cases under each scenario. There is some emerging data available in this respect at industry level and the same can be used to estimate claim severity.

   The major upsurge in COVID-19 and consequential impact on economy may also give rise to claims due to mental disorder in the medium to long term.

Impact on Expenses: There can be slight increase in expenses initially to enable employees to work from home. Over a period of prolonged lockdown there will be saving in expenses related to office running. Any capital expenditure decision may get deferred due to uncertainty around duration and intensity of spread. In current environment companies across sectors are trying to optimise expenses under various heads.

Role of actuaries in current situation: Actuaries can play a vital role in current situation. They are natural risk managers by education as well as experience. Important thing is that they need to get involved not only in financial aspects of it but also contribute from operational and strategic point of view. The following are some of the important actions that may be required in current situation:

1. Scenario Modelling: Management and Board of Directors will be quite keen to know the range of financial outcome COVID-19 Pandemic can entail on the organisation with respect to important metrics, like, GWP, Claims Ratio, Profit, Cash Flow, Capital, Investment Portfolio, Net Worth, etc. A collaborative effort is required in this respect by various functions across the organisation, like, Financial Planning & Analysis, Sales, Clinical Teams, Operations, etc. Actuaries can anchor the whole scenario modelling exercise because they are at vantage point and have holistic view of things.

2. Investment Risks and mitigation: In current situation where claims out go may increase and business volume may go down the investment related risks may be very relevant and need immediate attention.

Important aspect is not only to highlight risk but also suggest action plan to mitigate the same. Actuaries can play an important role in mitigation of following risks:

a. Market Risk: There is a sharp decrease in the equity value coupled with all time high volatility in last month or so. The interest rate cuts globally have increased the Mark-to-market (MTM) profit in bond portfolio on the other hand. It is important to optimise portfolio allocation in different asset classes with medium to long term view without crystallising losses in the short term. The use of derivatives to the extent permitted may also be resorted to for the purpose of hedging risk.

b. Credit Risk: There are slew of credit downgrades and increase in spread for corporate bonds in last few months. The COVID-19 Pandemic may further increase the credit spread. This may set-off some of the MTM gain in bond portfolio and may have impact on liquidity position of the insurance company. A thorough and forward looking analysis of the investment portfolio is required involving experts with clear action plan. A proactive approach can be of great value here rather than reacting after credit event.

c. Liquidity Risk: In current scenario liquidity is paramount. The Market and Credit Risks have direct impact on liquidity position of the organisation. The increase in volatility and credit downgrades may have negative impact on marketability of the assets. On the other hand lower new business volume and higher claims outgo may both have higher demand on the liquidity. Therefore, it is important at this time to conserve cash and to invest new cash flow in liquid assets. Liquidity and Security of portfolio take precedence over return in these volatile times.

d. Reinvestment Risk: The interest is on lower side currently, hence any assumption on yield for future needs to be re-looked at in near term. It is important to choose the duration of the portfolio while investing new funds and should take into account the interest rate outlook in medium to long term. The equity prices are down and volatile and any investment there should be considering risk appetite of the company.

3. Business Continuity and Operational aspects: The safety of employees and continued service to its customers should be the highest priority of any organisation. The Business Continuity Plan (BCP) is invoked in most of the organisation. It is imperative that all functions support and contribute for common business goal in this need of hour. It is most important to ensure that there is no adverse impact of customer service related to claims or otherwise due to this disruption.

4. Product Innovation: A successful product is the one which caters to the need of the insured and at the same time viable from the perspective of the insurer. There is certainly a heightened sensitivity around this pandemic and actuaries can build products around this but while pricing such products a care should be taken to mitigate risks because the extent of this Pandemic is still unknown. All stakeholders should be closely involved and aware of range of outcomes any such product can entail.

5. Strategic Directions: Once the Pandemic is over companies across sectors will explore ways to re-align their business model to deal with such catastrophes more effectively in future. In this respect digital is the way to go whether it is related to acquiring business or running operations. The digital initiatives will get lot of impetus and organisations across sectors will realise the importance of running business digitally in view of cost efficiency, convenience, robustness and resilience in case hit by such catastrophic events, etc. Actuaries need to not only adept themselves in this respect but also champion the cause across the organisation.

6. Think the unthinkable: COVID-19 is certainly a 'Black Swan' event and will have long lasting impact on risk management strategies of insurance companies. Particularly for health insurance companies, pandemic of such magnitude may have multitude of impact by way of business disruption, higher claims outgo, short term dip in new business, etc. There will be heightened sensitivity around such 'Black Swan Events' and we as actuaries we need to model such events and align our pricing and reserving practices to them.

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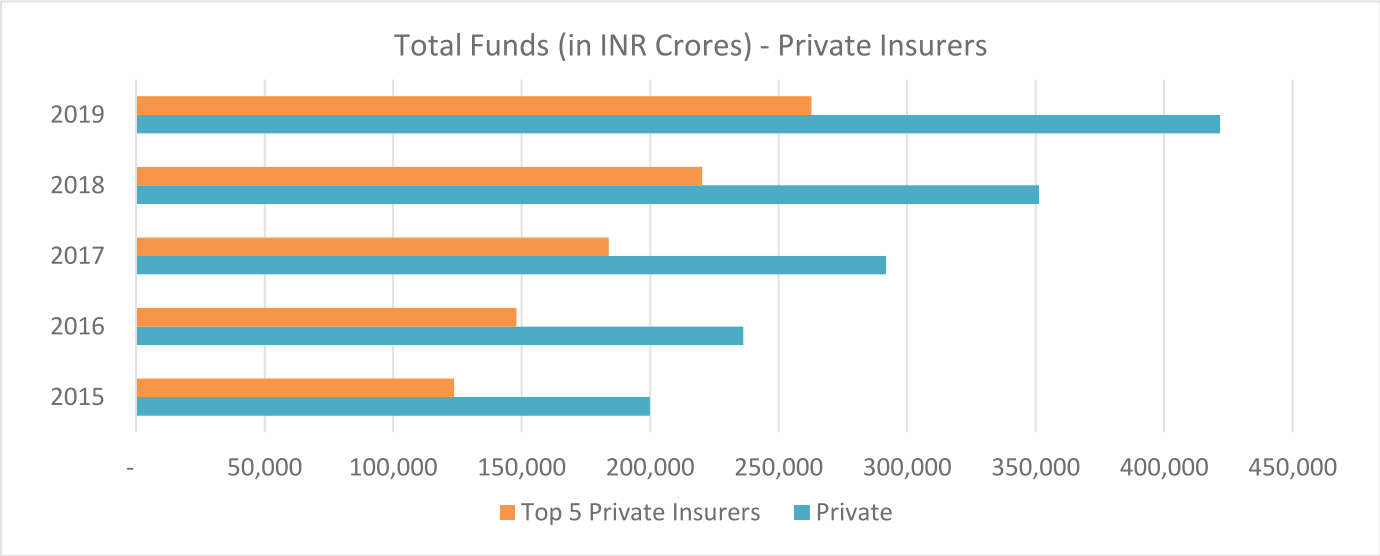
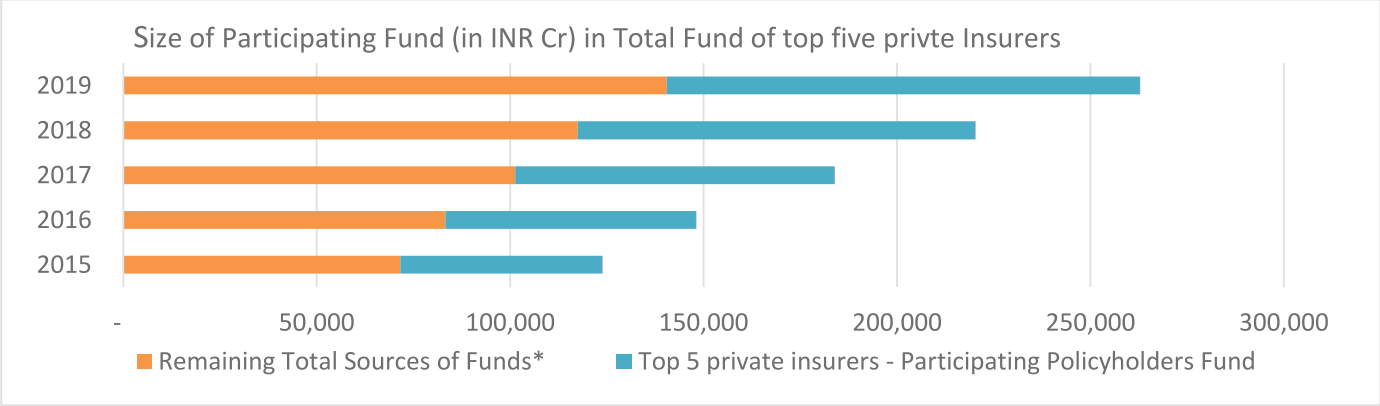
Risks to Policyholder Reasonable Expectations posed by Covid-19 pandemic

Insurance is a typical choice for individuals seeking to secure their wealth over a long period of time. It offers in-built risk coverage for untimely death before maturity and some level of guaranteed (potentially tax-free) returns on survival benefits till maturity. Customers endeavor to maximize the benefits offered under the product to match their needs of protection and savings, which in turn is influenced by the customer's risk aversion. To meet these requirements, life insurance companies have introduced products with varying features and participating (with-profits) products continue to be a popular choice amongst customers in recent years.

The graph below depicts the total sources of funds for private insurers excluding the assets held to cover the linked liabilities ("total fund"), split between the top five private Insurers and the remaining private Insurers. The top five private Insurers have been selected based on the total fund under management as of 31st March 2019. It can be observed that in the financial year 2018-19 almost 62% of total fund is concentrated within the top five private Insurers (INR 262,800 Crores of total fund of top five Insurers out of INR 421,817 Crores of total fund of all private Insurers as at 31st March 2019).



The graph below demonstrates the split of the total fund for the top five private Insurers between Participating fund and the remaining total fund during the last 5 financial years. It can be observed that Participating fund is approximately 47% of the total fund of the top five private Insurers (Participating fund of INR 122,289 Crores out of INR 262,800 as of 31st March 2019). It can be inferred that the par business has grown at approximately the same scale and pace as that of the non-linked non-par business in the past amongst those top five private Insurers.



While the growth in participating fund is remarkable, the pressure on private Insurers to meet Policyholders' Reasonable Expectations (PRE) is equally high. The admissible assets in which the premiums (net of expenses) are invested are well regulated. The invested assets are mostly of investment grade bonds with strong ratings and limited exposure allowed in risky assets such as equity, corporate bonds or derivatives. There are strong governance standards implemented by all insurers to meet the prescribed regulatory requirements for matters of investments.

Additionally, various regulations have been introduced over time in order to protect the interests of and ensure fair treatment to with-profits policyholders of the Company. In 2013, the concept of a "With-Profits Committee" was introduced consisting of an Independent Actuary in addition to the Appointed Actuary. Recently the regulator enhanced the scope of the With- Profits Committee. The latest 2019 Regulations now require the Committee to explicitly comment on how PRE is met and to look into the finer aspects of asset share methodologies and Bonus Earning Capacity calculations. This would help strengthen the governance of participating fund so that the insurers are reasonable in terms of setting and meeting PREs through policy illustrations and bonus declarations.

Under the current stress to the economy created by the Covid-19 pandemic, an important question that arises is whether insurers can continue to meet PRE and attract new business in the participating fund. The answer depends on the following key items: Insurer's past history of bonuses, illustrations at point of sale, bonus philosophy of the company, the quality of the invested assets, the availability of long term assets of investment grade quality, size of the par fund and their financial strength under various economic stress scenarios together with the management actions to combat those shocks.

The bonus philosophy of the Company outlines the key elements underlying its strategy for overall participating fund management. Important points to consider under the current environment would be – how the philosophy deals with losses due to actual asset defaults, the company's past practice of allowance for expected defaults, allowance for cost of guarantees and smoothing etc. while setting bonuses for new business illustrations and annual declaration of regular bonuses for in-force business.

Total investment losses in the participating fund would be shared between asset shares and estate. Where there is no cost of smoothing (or expected credit defaults) charged to asset shares, then any actual investment losses (realized losses or impairments) would be proportionally passed onto the asset Shares via the actual investment return credited for the year.

If asset shares have been charged with some smoothing costs, then in the current scenario any actual asset defaults might first need to be adjusted against accumulated amounts of these smoothing charges (cost of investment guarantee, cost of smoothing, cost of expected defaults lying within the estate) as on date, and any excess may be charged proportionally to asset shares and the remaining estate.

The current stress on the economic markets has increased the credit spread on corporate bonds significantly. Whilst the investors are looking for safe heaven, the demand for government bonds are expected to increase, causing an uptick in price of such bonds and a downward trend in the government bond yield curve.

Alternatively, the yield curve could become inverted as the demand for long term bonds could be higher than short term bonds. This could have a downward impact on the long-term best estimate yield that can be generated from the investments, considering the reinvestment risk. While credit spreads widen, the treatment of expected asset defaults, investment guarantees and smoothing within the participating fund and the declared historical bonuses could become the key component of the bonus earning capacity and bonus sustainability – for both of the in-force block and future new business that is to be underwritten in the future.

The quality and mix of assets in the par fund, together with strong and proactive investment management would be crucial for ensuring that PRE is met. The industry is bracing itself for expected credit losses and fall in market value of equities in the near future, especially with respect to those stocks or bonds pertaining to industries adversely impacted due to COVID-19 such as Airlines, Tour and Transport, Hospitality, Export oriented industries etc. to name a few. Proactive investment management is the need of the hour to ensure that any expected changes in the projected assets cash-flows are closely monitored and suitable action is taken to minimize any adverse impact.

After taking into consideration the above factors, any remaining mismatch between the assets and liabilities and the availability of assets to meet the required reinvestment yield on net cash flow would be important to the ability of the Insurer to fulfil its PRE commitment.

One of the key components of the PRE is historical trends and thereby the level confidence of the customers on insurers' ability to meet their reasonable expectations. Insurers who have been aggressive in the past in terms of bonus declarations to attract higher levels of new business, with an overall objective of achieving economies of scale in the participating fund and thereby

maximizing returns to the policyholders, might be required to revisit the level of bonuses in the current scenario, depending on the extent to which they were successful in scaling up the size of the participating fund.

The size of the participating fund would be an important component to determine the ability of Insurers to exercise a steady plan to manage the risks that it could be facing to meet PRE and attract new business under the current environment. It is advisable that insurers devise appropriate capital management plans, based on varying economic scenarios together with various management actions. This would assist them in taking corrective actions quickly together with lower expected costs, in order to manage similar economic stresses in future.

Lastly, Insurers can explore investment in asset classes (e.g. structured products etc.) that can help them hedge market risks, based on their risk appetite, subject to regulatory constraints.

To manage PRE, insurers can also look into viability of products currently offered for sale, in the context of inherent levels of investment guarantee. Actions could include changing certain product features to manage the investment guarantee risks appropriately. Other important areas where insurers should focus would include more active investment management (e.g. tracking stressed assets and devising an appropriate management action plan for them), regular Asset Liability Management (ALM) updates, assessing solvency levels more frequently by stressing economic and non-economic parameters appropriately, revisiting their business plans and capital management plans in the light of the investment and business risks posed by the Covid-19 pandemic.

The details mentioned in this article are the independent views of the writers of this article and not that of their employers or clients.

[All the data sources are from IRDAI website]

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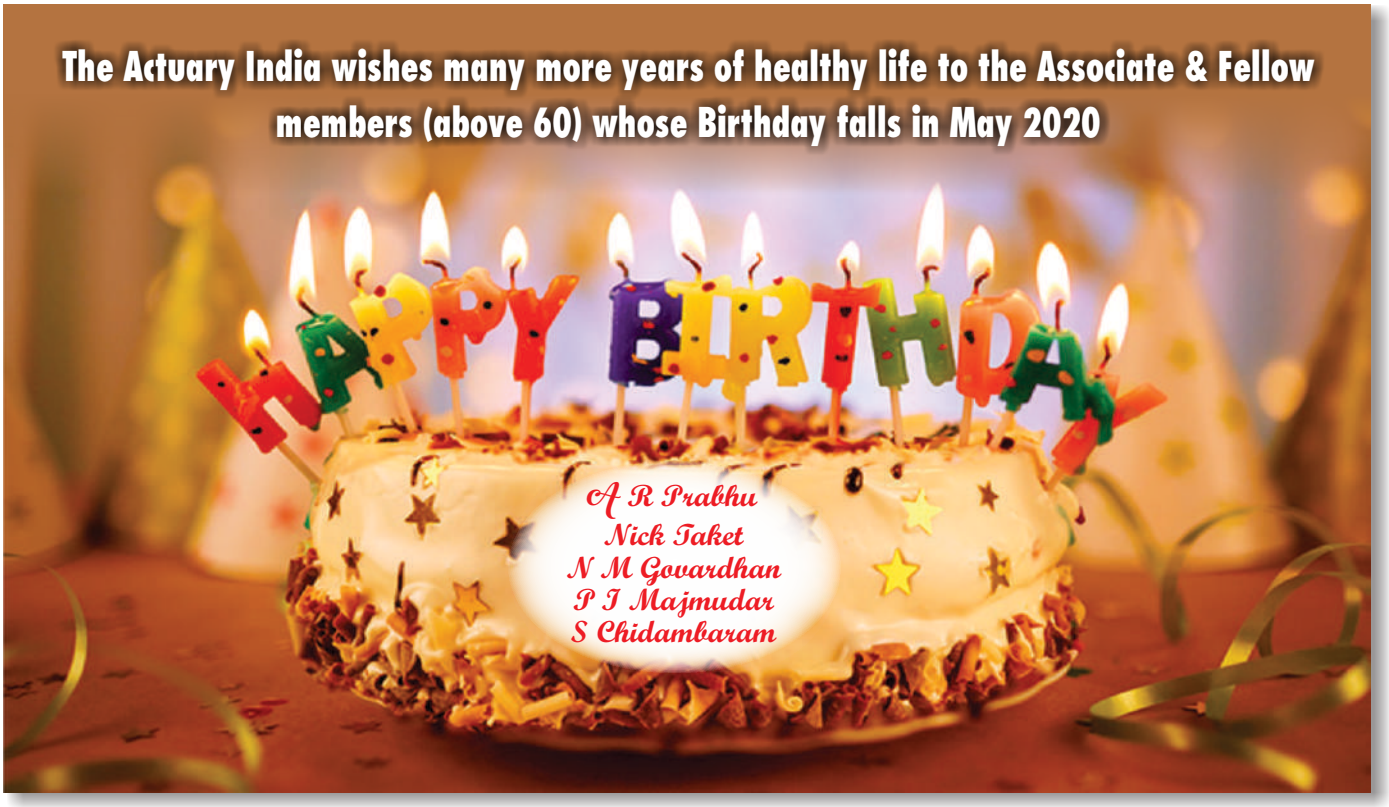


Epidemic Model - S.I.R.

Introduction

In this article, we are going to learn the broad definition of epidemic and understand the various mathematical models used in the epidemiology world. Further, we will look at a very simple mathematical model SIR with some numerical examples.

What is Epidemic?

A broad definition of the epidemic is rapid spread of disease to a large number of people in a given population within a short period of time. Other definition is "affecting many persons at the same time, and spreading from person to person in a locality where the disease is not permanently prevalent."

Mathematical models of Epidemic:

Various mathematical models are developed and used to project how infectious diseases progress in the population over a short duration and help to decide whether the situation is epidemic or not.

These models are based on certain set of assumptions and/or collection of various medical and statistical information to formulate the model and estimate parameters in the model.

These parameters are helpful to predict the effect of different interventions like lock-down of the region, self-quarantine, social distancing, vaccination programmes etc.

Further, these models are broadly categorised in two types. Stochastic and deterministic.

In this article, we are going to study the simple epidemic model called SIR model which is a deterministic model.

SIR Model

SIR stands for -Susceptible, Infected & Recovered

Let us consider the population under study as (P) and divide it into three different buckets.

First bucket is labelled as 'Susceptibles' (S). Susceptibles are those people who are capable of becoming ill from infection assuming that infection is present in the system & they are capable of infecting others. Hence, at the beginning of the study, we assume that everyone in the population is susceptible to infection.

There is second bucket of people 'Infected' (I) where all the people in this bucket are currently infected. When people are in infected bucket (I), they have already left the bucket of susceptible (S).

Over the period of time, infected people in bucket (I) will hopefully be transiting to recovery phase and they will transit into 'Recovery' (R) bucket. Here, it is assumed that death rate is very negligible compared to recovery rate and it is ignored in the modelling.

Modelling assumptions

So, let us make the following assumptions for this model:

1. Population under study (P) will remain constant over the period of time.
2. Rate of transmission (α) and rate of recovery (β) is constant over the period of time.
3. Infected people (I) are capable of transmitting infection to other people or they will recover
4. Those who have recovered from infection are currently in 'Recovered" (R) bucket & they will neither get infected again in future nor spread infection to any other people.

Hence, based on above assumptions, we can write the following simple equation:

$S(t) + I(t) + R(t) = P$ (entire population under study);

for $t>=0$

Beginning conditions in the model

For any model building exercise, we always try to find the initial values at time 0.

At the beginning, number of people susceptible at time 0 are $S(0) = S_0$, and number of people having infection at time $t = 0$ are $I(0) = I_0$ (Very small number in the beginning compared to S_0)

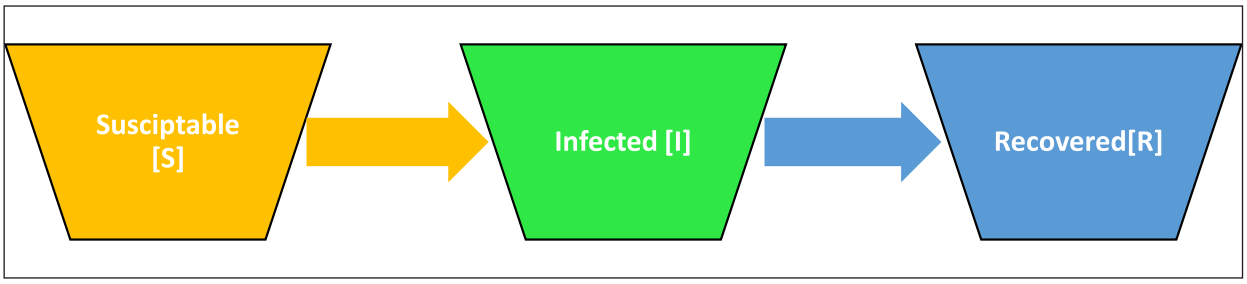
It is obvious that at t=0, there are no people in the recovery bucket i.e. $R(0) = 0$.

Therefore, $\frac{d(S + I + R)}{dt} = 0$

Hence $S + I + R = S_0 + I_0 = P$

Simple SIR Model:

Now let us see diagrammatically how simple SIR model looks:



Construction of SIR Model

Now we are interested to know how the rate of susceptible [S] will change with respect to time (t).

Similarly, we are interested to know how the change in number of infected [I] & recovered people [R] with respect to change in time [t].

That means that, we are interested to know

$\frac{dS}{dt}$, $\frac{dI}{dt}$ and $\frac{dR}{dt}$.

Now our task is to formulate three differential equations and solve these equations.

Now let us first construct the equation for $\frac{dS}{dt}$. Using the following argument.

If infected person comes closer to susceptible person then there is some likelihood that susceptible person can be infected. The more the number of infected and susceptible people come closer to each other, higher the likelihood that a greater number of susceptible people will get infected.

Thus, $\frac{dS}{dt} = -\alpha S I$ where $\alpha > 0$, α is a transmission rate [1]

Here rate of change is negative as a smaller number of susceptible people will be there in the susceptible bucket as infectious people from this bucket will move/transit to the bucket of infectious people [I].

Now let us construct the equation for $\frac{dI}{dt}$

As seen above that susceptible people who got infected would transit to infectious bucket [I]. Further, those affected people in the infectious bucket [I], some might get permanently recovered due to their strong immune system & they would no longer will be able to infect other people after they recover from infectious stage.

i.e. $\frac{dI}{dt} = \alpha S I - \beta I$ where $\alpha, \beta > 0$ [2]

For $\frac{dR}{dt}$, it is easy to construct the equation.

Here, those who have recovered from infectious state will be moving into the recovery bucket [R]

Hence the rate of recovery will be:

$\frac{dR}{dt} = \beta I$ where $\beta > 0$, β is a recovery rate [3]

Hence, we have constructed following systems of differential equations which need to be solved.

$\frac{dS}{dt} = -\alpha S I$ where $\alpha > 0$, α is a transmission rate

$\frac{dI}{dt} = \alpha S I - \beta I$ where $\alpha, \beta > 0$

$\frac{dR}{dt} = \beta I$ where $\beta > 0$, β is a recovery rate

These equations are solved easily for S, I and R using R software.

We can us general solver for ordinary differential equations using the function in R with (desolve) package:

ode(y, times, func, parms, method = ..., ...)

Model Investigation

Now, let us zoom the equation $\frac{dI}{dt} = \alpha S I - \beta I$ which we have seen above.

Before we decide whether there an epidemic or not epidemic, we have to look at the beginning of the time period i.e. at t=0

$$\left.\frac{dI}{dt}\right|_{t=0} = \alpha S_0 I_0 - \beta I_0 = I_0 (\alpha S_0 - \beta)$$

If $\left.\frac{dI}{dt}\right|_{t=0} < 0$ means number of infected people are lower than number of recovered people in each time period. No epidemic. That means if

$(\alpha S_0 - \beta) < 0$ or $\frac{\alpha S0}{\beta} < 1$ then no epidemic.

If we want or $\frac{\alpha S0}{\beta} < 1$ then we aim for:

1. Lowering the transmission rate α.
   This can be achieved through washing our hands with soaps on regular basis, using hand sanitizes, following self-quarantine, maintaining the social distancing, locking-down and keeping the house and the city clean & hygienic.

2. Lowering the initial susceptible population S_0
   This is achieved by giving the vaccine so that number of susceptible people S_0 from the population P will be less in number at initial time 0.
   If vaccine is not yet developed then nothing can be done to reduce the susceptible number S_0 at time 0.

3. Increase the recovery rate β:
   This is bit harder to achieve and it depends on the person's immunity and strength of antibodies which can resist the attack of virus. It is generally found that the recovery rate is lower with people who are suffering from other diseases and old aged people with some other illnesses.

If $\left.\frac{dI}{dt}\right|_{t=0} > 0$ means number of infected people are higher than number of recovered people in each time period. This is an alarming situation and it shows the presence of epidemic in the population.

i.e. $\frac{\alpha S0}{\beta} > 1$

Example to understand the model

Now let us take a hypothetical scenario where the initial population under study is P =100,000 with initial number of susceptible and infected people are S_0 = 99,900 and I_0=100 respectively.

Now let us study two scenarios:

1. Scenario1: $\frac{\alpha S0}{\beta} < 1$

2. Scenario2: $\frac{\alpha S0}{\beta} > 1$

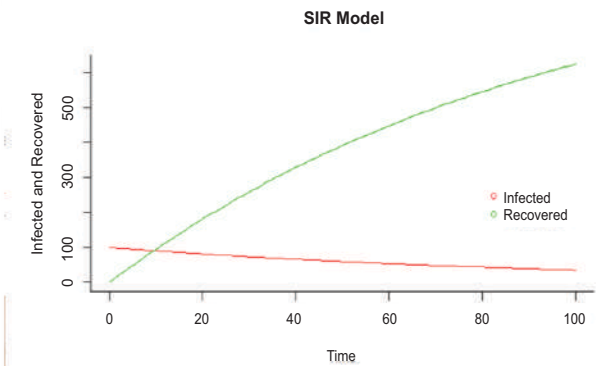
Scenario 1 (No epidemic): $\frac{\alpha S0}{\beta} < 1$ i.e. $\frac{\alpha}{\beta} < 0.00001010$.

Let us take β =0.1 & α = 0.0000009

then $(\frac{\alpha}{\beta})$ =0.000009 <0.00001010

Here, we expect that there is no epidemic. You can see the following table and the graph:

No. of days	Susceptible	Infected	Recovered
0	99,900.00	100.00	-
1	99,891.05	99.00	9.95
2	99,882.20	98.00	19.80
3	99,873.44	97.01	29.55
4	99,864.76	96.04	39.20
--	--	--	--
97	99,349.61	36.54	613.85
98	99,346.36	36.16	617.48
99	99,343.14	35.78	621.08
100	99,339.96	35.40	624.64



Based on above table and the graph, we can see that number of infected people are reducing over time period and number of people are recovering at a faster pace over the same time period. This is a good sign and hence this scenario is not depicting an epidemic situation.

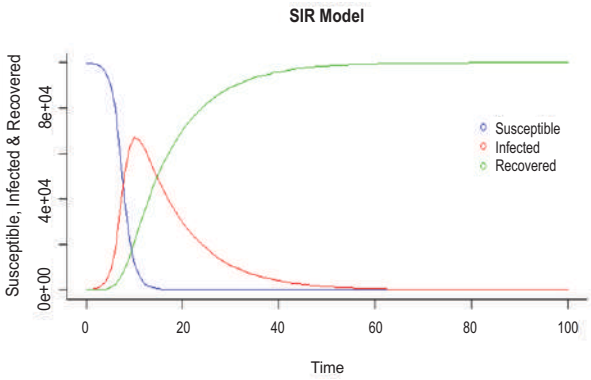
Scenario 2 (Epidemic): $\frac{\alpha S0}{\beta} > 1$ i.e. $\frac{\alpha}{\beta} > 0.00001010$

Let us take β =0.1 & α = 0.00001011

then $(\frac{\alpha}{\beta})$ =0.0001011 > 0.00001010

Here, we expect that there is an epidemic. Let us carefully study the following table and the graph:

Time in days	Susceptible	Infected	Recovered
0	99,900.00	100.00	-
1	99,735.44	248.25	16.31
2	99,328.63	614.63	56.73
3	98,331.89	1,511.62	156.49
--	--	--	--
8	39,762.66	51,125.15	9,112.19
9	22,195.33	62,925.46	14,879.21
10	11,435.64	**67,125.84**	21,438.51
11	5,814.40	66,056.70	28,128.90
12	3,033.28	62,401.68	34,565.04
--	--	--	--
98	4.0697	12.22	99,983.71
99	4.0692	11.05	99,984.88
100	4.0688	10.00	99,985.93



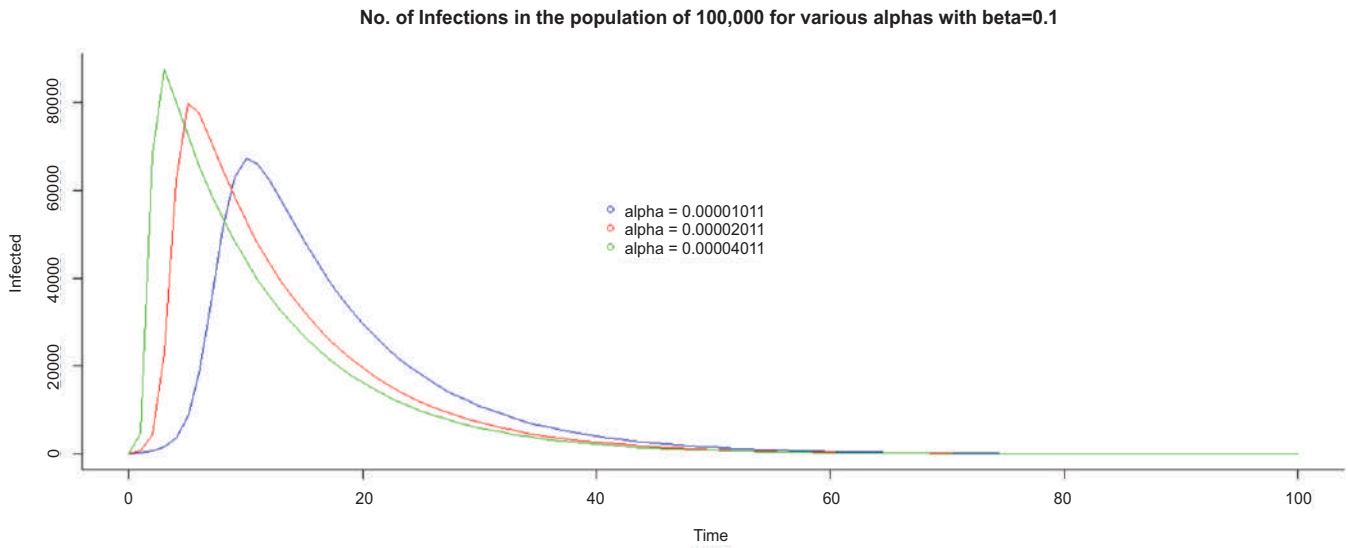
We can see that infected people are increasing from time 0 to time 10 at much faster rate than the recovery of the people during the first 10 days. This is the epidemic period which is small and the number of cases is increasing rapidly in exponential way during this short period of 10 days. This is the challenging period if the authorities are unable to cope up with the number of infected cases which increases at much faster rate in the first few days.

From the graph, it can also be seen that number of susceptible people reduces over the time period as during initial time period, they move more into the infectious bucket (epidemic period) and during later time period it moves into the recovery bucket.

Now let us take different values of infectious rates (α) with rate of recovery β =0.1 and see the impact.

Let us draw the graph for various transmission rates

α = 0.00001011 , α = 0.00001011 , α = 0.00001011 with β =0.1



You can see that higher the transmission rates (α), higher the steepness of the exponential curve.

So, authorities aim is to bend the exponential curve by lowering the transmission rate (α)so that it can get more time to arrange for medical and other facilities and simultaneously control the epidemic by implementing various measures as discussed above.

Conclusion:

Reduction in rate of transmission is very important before situation goes beyond control.

To achieve this, various measures must be taken from washing the hands with soaps to self-quarantine & social distancing.

Model is trying to project the number of people in various categories- "Susceptibles, Infected and Recovered" based on certain set of assumptions.

In reality there are various other factors which are complicated to model. Nevertheless, epidemic models help the authorities in planning various resources and keeping health care system ready in advance thereby helping the population to recover from the epidemic.

Last but not the least, we have to fight vigorously with an unseen enemy (epidemic) and defeat it by just strictly following instructions and directives issued by authorities from time to time.

Written by

Suresh Sindhi

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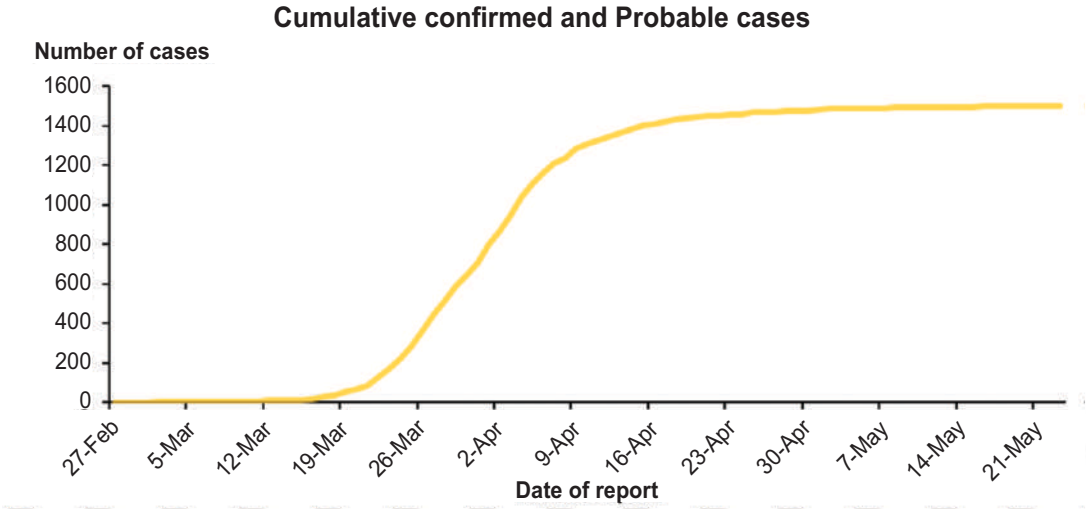
Suresh Sindhi is a qualified actuary both from Indian and UK Actuarial institutes with more than 20 years work experience in life insurance and pension actuarial domain.

New Zealand

New Zealand closed its borders to non-residents on 20 March, with 14-day isolation for returning residents. Full lockdown except for essential services started on 26 March. The number of Covid-19 cases has levelled off, with reopening in stages from 14 May.



Going hard and going early helped. As of 24 May, 259,152 tests on 176,302 people had been performed (3.5% of population) of which 1,503 are confirmed or suspected cases (8.5% of people tested, 0.03% of population). There are a further 176,302 test kits in stock, with more on the way.

1,455 of first wave cases have recovered (96.8%), 21 died (1.4%) and 27 are still active (1.8%). Systems are in place for extensive testing, contact tracing and quarantining all inbound passengers. This should contain any potential future outbreaks.

Australia has also largely contained the outbreak, with talk of exempting travellers between Australia and New Zealand from quarantine requirements within a combined Trans-Tasman bubble.

As with the WHO Wuhan study, fatality rate increase with age. The NZ rates are: 0.0% up to age 59, 1.7% 60-69, 9.3% 70-79, 29.2% 80-89 and 57.1% 90+.

There is a sense of optimism that the worst is over. Government is providing a large fiscal stimulus, supported by monetary stimulus for the Reserve Bank of New Zealand. New Zealand's debt to GDP (19.2% in 2019) is lower than most other OECD countries. Hence, the ability to do whatever it takes to prevent unemployment rising above 10% (4% pre- Covid-19).

Domestic tourism may help fill the loss of international travellers. The volume of primary exports should hold up and currency devaluation to partly offset lower prices.

Impact on life insurers

Life insurance claims will not be materially affected. The few Covid-19 deaths in New Zealand are mostly uninsured retirees.

Meanwhile, Income Protection claims will worsen. Insurance covers inability to work through illness or injury, not unavailability of work or unhappiness at work. However, the diagnosis of mental health or muscular skeletal conditions relies the patient's perception rather than just objective diagnostic tests.

Studies elsewhere show new claims increase and fewer claimants return to work when unemployment and under-employment increase. The impact is mitigated in New Zealand by an easily accessible safety net, now without an offset for retrenchment benefits.

Most life insurers have placed underwriting restrictions on new income protection covers. Taxable benefits will be capped at 75% of pre-disability income (rather than agreed value), benefits limited to a maximum of five years (rather than to age 65) and deferring 'at risk' cases for 3 months (rather than 1 month for life cover).

Reinsurance capacity remains in-tact with no price increase for mortality or Covid-19 exclusion. Reinsurance rates will increase to remediate income protection (this was 'on the cards' pre-Covid-19).

Insurers with Pandemic excess-of-loss cover are likely to exercise reinstatement provisions. New pandemic cover is available for New Zealand and Australian cedants, but at a much higher price than last year.

Some advisers used technology to video-call prospects and get electronic signatures that all underwriting questions are accurate and complete. Thus, submissions have held up quite well.

Lapse rates have halved, despite unemployment rising from 4% to 10% and many people working reduced hours. There is a fear of leaving the family uninsured when there is a heightened awareness of infections and deaths.

Life insurance has been income inelastic, helped by lots of government grants to employers to pay furloughed workers. As life returns to normal, government cash runs out and fear of Covid-19 subsides, lapses may increase. Meanwhile, home-loan rates have fell and banks allow restructuring, enabling insured customers with less income to reduce mortgage payments. This stabilises household disposable income to meet necessities such as insurance premiums.

Initially, regulators were very active, checking in frequently, asking about business continuity, providing information on websites about unaffected coverage and specifying scenario testing. Insurers are submitting a summary solvency return every month, to supplement the half-yearly full solvency return.

Although insurance was designated an essential service virtually all staff have been working from home, supported by good technology. Most insurers started working from home before the lock-down started.

Productivity has increased during the lock down. Staff are handling more call volumes with no noticeable increase in call abandonment rates or call waiting times. Some insurers are planning a gradual return to the office. Next month, two groups will alternate working from home one week and in the office the next week. It remains to be seen if this becomes an enduring change.

Remote working has a lot of support from those who would normally spend a considerable amount of time commuting to and from work. However, people also miss the face to face interaction at the office. The consensus is to spend about half the time in the office.

Written by

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John Smith is the Appointed Actuary of Fidelity Life the largest New Zealand owned Life Insurer and Convenor of the Professional Standards Committee of the New Zealand Society of Actuaries.

Agriculture Insurance Company of India Limited

Head Office, Office Block 1, 5th Floor, Plate B & C, East Kidwai Nagar New Delhi 110023

Agriculture Insurance Company of India Ltd., New Delhi is inviting application for **Actuarial Apprentices**. The candidates should have passed Graduation in any discipline from recognised University with at least 60% or more marks in aggregate (55% in case of SC/ST candidates), and have passed or have been exempted from at least 5 actuarial exams conducted by Institute of Actuaries of India (IAI) or Institute and Faculty of Actuaries, UK as per Curriculum 2019. For details, eligibility criteria visit Company's website **www.aicofindia.com** (Notice Section).

Commencement date for submission of application : **21st May 2020 (from 8.00 a.m.)**
Last date for submission of application : **11th June 2020 (upto 8.00 p.m.)**

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RECRUITMENT OF ACTUARIAL APPRENTICES

National Insurance Company Ltd., Kolkata is inviting applications for Actuarial Apprentices from aspiring students who are pursuing Actuarial studies to become Actuaries.

APPRENTICESHIP CONDITIONS:

- Period of apprenticeship is two years.
- On completion of two years, apprentices shall be eligible for the post of Administrative Officer (Scale I) on passing minimum 2 (two) additional actuarial papers and subject to satisfactory work performance during the apprentice period.

TOTAL NUMBER OF VACANCIES:

6 (Six) (Reservations shall be applicable as per Government guidelines).

ELIGIBILITY CONDITIONS AS ON 1st June 2020:

- Qualifications:

  1) Graduation from recognised university with at least 60% or more marks in aggregate (55% in case of SC/ST candidates).

  AND

  2) The candidate should have passed or have been exempted from at least 5 actuarial exams conducted by Institute of Actuaries of India (IAI) or Institute and Faculty of Actuaries, UK as per curriculum 2019.

- Age: Not more than 30 years as on 01.06.2020, relaxation up to 33 years for OBCs and 35 years for SC/ST and 40 years for person with PWD.

MONTHLY STIPEND:

- 1st Year = ₹30,000 per month.
- 2nd Year = ₹32,500 per month.

OTHER IMPORTANT DETAILS:

- All eligible candidates will have to appear for Personal Interview, their selection will be based on their performance in the same.
- Postings of selected candidates will be at Head Office, Kolkata
- For 'how to apply' and other important details, candidates should visit the recruitment section of website of National Insurance Co. Ltd. **https://nationalinsurance.nic.co.in/**.

LAST DATE FOR RECEIVING APPLICATIONS: 25th June 2020.

Sd /-

(Chief Manager)
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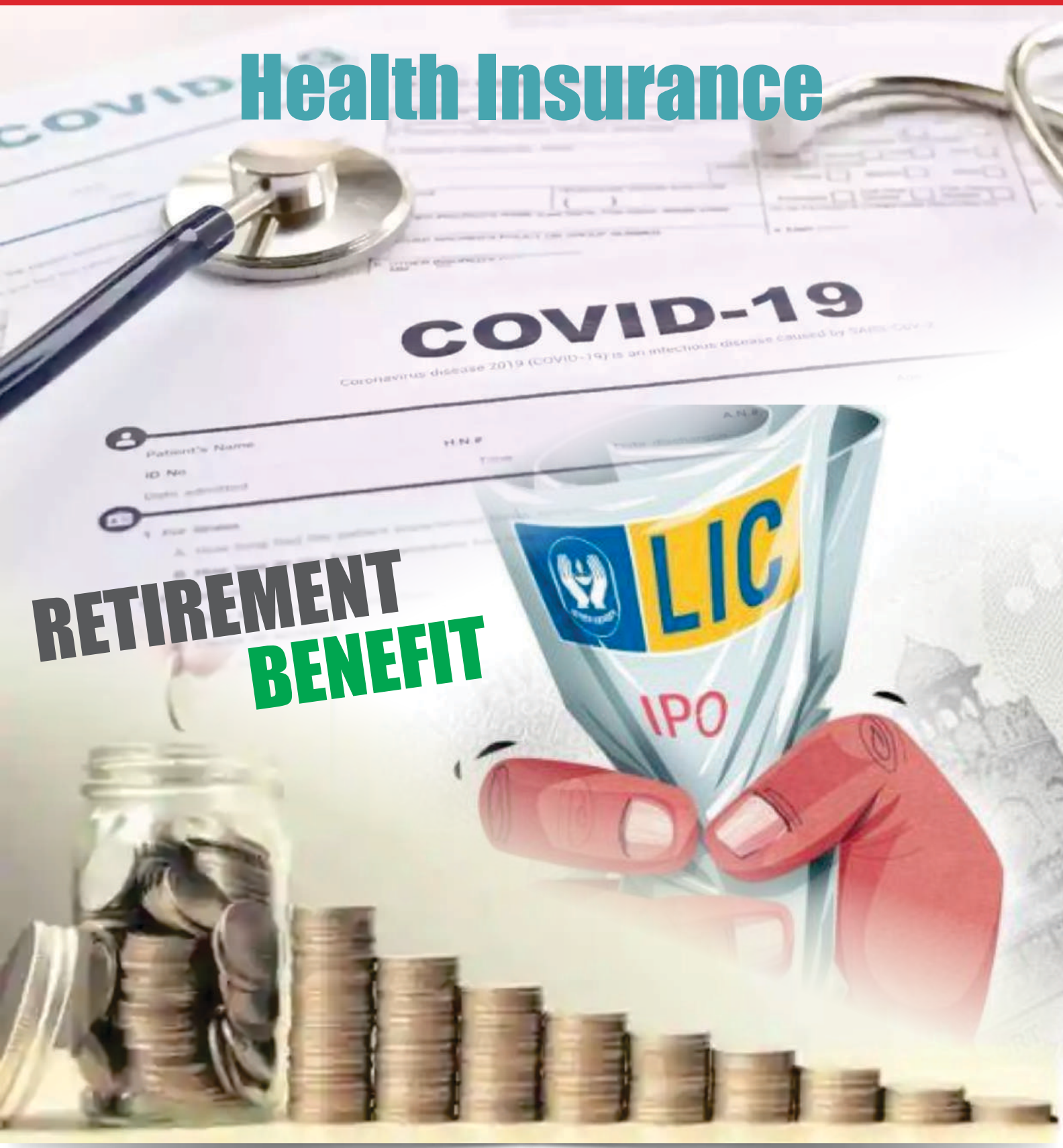

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