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INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

List of Candidates Scoring Highest Marks in June 2019 examination

Sr. No.	New Subject	Subject Name	Prize Fund	Candidate Name	Membership ID	Place
1	CS1	Actuarial Statistics	Shri. H V Krishnamurthy Prize	Maadhav Gupta	35154	Delhi
2	CS2	Risk Modelling And Survival Analysis	Shri. R. Krishnaswamy Prize	Bhavya Mukesh Shah	36831	Mumbai
3	CM1	Actuarial Mathematics	Smt. Vidhya Wati and Smt. Santosh Kumari Memorial Scholarship Prize	Varun Vishnu Agrawal	34931	Nagpur
4	CM2	Financial Engineering And Loss Reserving	Shri. G S Diwan Centenary Commemoration Prize	Vinayak Rawat	33684	Jaipur
5	CB1	Business Finance	Shri. Atma Ram, Shri Chhaju Ram and Smt. Parvati Devi Memorial Scholarship Prize	Radhika Rathi	31665	Mumbai
6	CB2	Business Economics	Shri. R M Joshi Prize	Korounganba Phuritshabam	35840	Chennai
7	CP1	Actuarial Practice	The Future Actuary Prize	Deepesh Hemendra Gada	31742	Mumbai
8	CP2	Actuarial Modelling	Shri R. Krishnaswamy Memorial Prize	Shreya Agarwal	25531	Kolkata
9	CP3	Communication Practice	J R Joshi Prize	Vishal Grover	2230	Mumbai
10	SP1	Health And Care	Shri. G S Diwan 100th Birth Anniversory Memorial Education Prize	Gaurav Jaswal	2802	Delhi
11	SP2	Life Insurance	Late Shri. Janardan Pundalik Nerurkar Prize	Kaustav Sen	30341	Delhi
12	SP4	Pensions And Other Benefits	Shri. K A Pandit Memorial Prize	Deepali K Mittra	4060	Delhi
13	SP5	Investment And Finance	Shri. Kamal Kumar Noranglal Podar Prize	Yash Gopal Ratanpal	27002	Mumbai
14	SP6	Financial Derivatives	Late Shri. D Basu Prize	Tanvi Milan Doshi	31940	Mumbai
15	SP7	General Insurance Reserving And Capital Modelling	-	Mahipal Choudhary	26485	Chennai
16	SP8	General Insurance : Pricing	-	Hemant Devidas Rupani	28256	Mumbai
17	SA1	Health And Care	Shri. G S Diwan 100th Birth Anniversary Memorial Education Prize	Manish Sen	5509	Gurgaon
18	SA2	Life Insurance	Shri. G S Diwans Memorial Prize	Kruti Dinesh Malde	24630	Mumbai
19	SA3	General Insurance	Late Shri K P Sarma Memorial Prize for the Meritorious in General Insurance	Nikhil Kamdar	19580	Bangalore
20	SA4	Pensions And Other Benefits	Canada Life Scholarship Endowment Prize	Timsi Sethi	12300	Delhi
21	SA7	Investment And Finance	Shri. G S Diwan Memorial Scholarship Prize	Abhishek Rastogi	10032	Delhi

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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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From the Desk of President

Mr. Sunil Sharma

It seems the time is flying. It's already been a year since I took over as President of this noble Actuarial Profession. I am very pleased to announce the dates for the **21st Global Conference of Actuaries**. The 21st GCA is scheduled to happen from 17-19th of February, 2020. We must have this as a special GCA as the actuarial profession in India completes 75 years of journey. The GCA organising group is extremely enthusiastic about the GCA event being planned this year being Platinum Jubilee of the Indian Actuarial profession.

Other critical event, which is scheduled that I must mention is **Asian Actuarial Conference (AAC), 2019**, is just two weeks ahead of now. AAC is scheduled on 21-24th October 2019 in Singapore. The theme of the conference is **"Crazy Responsive Actuaries - Taking action to secure the future"**. The three day conference covers a range of subjects everything in insurance and other key topics like IFRS17, AI, Big data and analytics in which IFRS17 is one of the keynote address. The three day conference topics indicate as to how Actuaries in the path of redefining their roles to evolve themselves in the ever changing market, risk and technology.

Richard Holloway, Vice President and me are attending the AAC meeting. We look forward to meet leaders of other Actuarial professional bodies to see what collaboration opportunities exist with them.

The profession is blessed with highly energetic volunteers who are contributing in various areas. The **"Actuarial Job Portal (AJP)"** is fully functional for use of students and employers. Quite a good number of students have already uploaded their profiles in the portal. I will encourage all actuarial personnel looking for new jobs or change of job to please update their profile on AJP. We are regulatory tracking the progress of profile updates by students.

I would like to congratulate Advisory group on Pensions and Retirement benefit have successfully conducted two day seminar on 5-6th September. The Advisory group did a fantastic job in terms of picking up the topics and expert speakers in their respective areas.

Another seminar attraction of the previous month was the Capacity Building seminar on Crop Insurance held on 26th September. I must thank **Ms. T L Alamelu**, Member(Non-Life), IRDAI who gave her key note address during the seminar. All important topical issues under crop insurance were covered under the program which include, pricing, underwriting, catastrophe modelling, claims management, product design and re-insurance.

In the path of serving public interest, Actuaries have a greater role in studying and advising the Government on various schemes of Public welfare in terms of social security, health and life. They also have a great role in projecting revenues and expenses on a long term basis by identifying and advising on various risk factors and ways and means of mitigation. In order to explore this service opportunity, we have set up a working group to look into and submit recommendations on setting up of a Government Actuarial Department (GAD) in similar line with UK model.

Results of the first examination based on the 2019 curriculum are out. The IAI has noted few takeaways from the results and have initiated few actions on priority basis. One of the areas which we have picked up is development of comprehensive course material for supporting students for CS1B and CS2B examinations based on R. The material is under development and shall be formally available from the next year examinations onwards.

We have seen good response to our notification inviting application for staff actuaries in IAI. Those who are interested in the Education side of Actuarial profession may please submit their interest at the earliest. Once staff actuaries are on board, I expect significant enhancement in the quality of services of the Institute in respect of Education and Examination.

The online coaching for November 2019 examination has already been announced. The biggest advantage of utilising this facility is that, it reduces the preparation time to an extent of 75% by which more time can be devoted for practising question papers and mock examinations which will increase the chance of success in a significant manner. By involving expert faculty members to connect with students, the subject is taught with strong credentials of concepts. Please connect with hoet@actuariesindia.org for any support. The IAI is also planning to conduct an R class room training sometime in the beginning of next month. Please watch out the website for the announcement and make use of the services.

The profession is celebrating their Platinum jubilee this year; a time to remember all our founders and great contributors of the Indian Actuarial Profession. I sincerely express my gratitude and appreciation to all our stalwarts who immensely contributed for the growth of the profession and brought us all glory and value in the market. I also congratulate all our members on the occasion of their great achievements.

I would like to sign off for now and will be back with more updates from my meetings with the leaders of Actuarial profession at AAC.

From the Desk of Chief Editor

Ms. Bhavna Verma

"Change in the only constant", an adage repeated very often however seems to be glaring at all of us as individuals, as well as a professional community, now more than ever. The awareness of this fact is rather clear from the themes of actuarial conferences around the globe; the latest I noted was "Crazy Responsive Actuaries – Taking action to secure the future". And we thought clearing actuarial examinations was the real struggle to attaining the perfect life!

The pace of change around us (technological, mindset and attitudes, lifestyle preferences, risk needs among others) is astonishing. The most 'useful' invention of modern times, the mobile phone has replaced our landline phones, calendar, watch, alarm clock, newspaper, diary, camera, television etc. as a one stop technology solution for a lot of our life needs. In order to enable such convenience however, businesses and processes are likely becoming more complex. Integrated solutions, digitization, operational ease, segment focused product offerings, risk based pricing are aspects that are increasingly discussed in the insurance ecosystems. Enabled by rapid adoption of data mining skills coupled with fundamental actuarial concepts, solutions to these emerging business problems are likely to benefit immensely from the active participation of actuaries.

This issue includes coverage of the seminars on Current Issues in General Insurance (CIGI) and Current Issues in Retirement Benefits (CIRB) which included some interesting sessions. The most recent Economic Survey forewarns of India's ageing population, even proposing an increase in retirement age. The role of actuaries in serving this larger public interest and

collaborating to find optimal solutions for retirement funding is hence critical.

Other features in this issue include life insurance industry update and an informative piece comparing healthcare systems in different countries; can India develop an innovative and effective model in due course suited to its peculiarities?

Do take note of the invitation to participate in projects related to risk management by the Advisory Group on Risk Management. It is a good opportunity to contribute thought leadership in your area of specialization and to do something interesting beyond your BAU.

Hope you enjoy the read. The festive month lies ahead and may this Diwali light up our lives, minds and profession even more!

ANNOUNCEMENT

4th Capacity Building Seminar on IFRS 17

Organised by: Advisory Group on IFRS 17 (IND AS 117)
Venue: Holiday Inn, Mumbai **Date:** 6th November, 2019 **Time:** 9:30am to 6:30pm

Background:

The International Accounting Standards Board on 18th May 2017 issued the new standard IFRS 17 - Insurance Contracts, with further amendments being proposed as part of the Exposure Draft ED/2019/4 Amendments to IFRS 17. This Standard sets the "rules" for determining the liabilities for insurance contracts. The implementation of IFRS 17 or the Indian equivalent IndAS 117 will impact measurement and reporting of financials not just from an actuarial perspective but also at an overall Company and Industry's perspective. In this seminar, which will be fourth among the series of such capacity building seminars, we have picked up some of the key topics under IFRS 17 and aim to perform a deep dive discussion on these topics. Objective is to encourage discussion with the participants on these topics such that Indian industry is well prepared for IFRS 17 implementation.

The Seminar would focus on the following:

1. A panel discussion on the topic of IFRS 17 implementation and its challenges with senior members from IRDAI, International Accounting Standards Board, Institute of Chartered Accountant of India, Institute of Actuaries of India.
2. Multiple deep dive sessions on topics such as Reinsurance, dealing with onerous contracts, new proposed IFRS 17 amendments, discount rates.

Presenters:

Experienced professionals who have dealt with this transition in other jurisdictions or are in the phase of transition with their clients / companies would be participating in this capacity building seminar and sharing their experiences and insights with the audience. For this seminar we are expected to have senior members from IRDAI, ICAI and IASB for some of the key discussions.

Who Should Attend?

- The seminar is open to all who wish to enhance their skills in IFRS 17
- Non-members are welcome to attend.

Any Pre-reads?

Participants are encouraged to have read the IFRS 17 standard, its Basis of Conclusions, IASB staff papers, IFRS 17 Exposure draft ED/2019/4 Amendments to IFRS 17. It is also encouraged that IRDAI's report on Report of the Working Group on New Standard on Insurance Contracts (equivalent to IFRS 17 Insurance Contracts) dated 31 Oct 2018 is also read.

Registration Fees (Excluding 18% GST):

Categories	Amount in INR
Students & Associate Members	3,500
Fellow & Affiliate Members	7,000
Non Members	7,500

General Points

- **Register at:** http://www.actuariesindia.org/SeminarRegistration.aspx
- **CPD Credit for IAI members:** 6 hrs. Technical (Any one practice Area as per APS 9 -Rev. Ver 3)

ANNOUNCEMENT

32nd India Fellowship Seminar (IFS)

DATE	5th & 6th December, 2019 (Thursday & Friday)
VENUE	The Orchid Hotel, 70-C, Nehru Rd, near Mumbai Domestic Airport, Navpada, Vile Parle East, Vile Parle, Mumbai, Maharashtra 400099; Phone: 022 2616 4000
PROGRAMME TYPE	Non-Residential
CPD CREDIT	12 hours, 6 hrs. Technical (Any one practice Area) & 6 hrs. Professional as per APS 9 (ver. 3)
PARTICIPATION FEE	₹ 15,000 + 18 % GST (Indian Rupees Fifteen Thousand Plus 18% GST) for IAI Fellow & Affiliate members. ₹ 15,000 (No GST) (Indian Rupees Fifteen Thousand Only) for IAI Students & Associate members. **Please login to your account on IAI website to Register & pay online (Kindly ensure that your subscription is up to date for the year 2019-20)**
PARTICIPANTS	The programme is open to: 1) All IAI Members for CPD requirement under APS 9 Ver. 3; 2) Student & Associate Members who have passed all the examinations or are close to qualifying as FIAI for fulfilling requirement for admission as FIAI. 3) Affiliate Members as a requirement for admission as FIAI.
REGISTRATION AND CONDITIONS	Login to your account on IAI website and Register latest by **1st October, 2019**. On successful completion of registration you will receive a Receipt from Noreply@actuariesindia.org. In view of the fact that all students, associates & affiliates participating for Fellowship have to be assigned topics for presentation, **the registration will close by 1st October, 2019. for Students, Associates & Affiliates** (those participating for admission as FIAI). The registration for IAI Fellow members will remain open till 30th November, 2019.
NOTES	1. The session on both the days will end at 5 p.m. Marking of attendance will be compulsory at the end of day on both days for granting CPD credits on the respective days. 2. Those participating for admission as FIAI will be subject to assessment of their performance by an Assessment group consisting members of Advisory Group on PEC. The decision of the Assessment group will be final. 3. Few fellows will be assigned roles and responsibilities as a Guide or Chairing a session, by the Advisory Group on PEC and this will be communicated in advance. 4. Registration will be on first come - first served basis.
DRESS CODE	Formal

INVITATION

Invitation to participate in projects related to risk management

Dear All,

In order to fulfil the Institute of Actuaries of India's vision of enhancing the skill sets of our actuarial students in the area of risk management, the Advisory Group of Risk Management (AGRM), will be initiating a series of projects. At this time, the AGRM is inviting an expression of interest from motivated students who are interested in enhancing their understanding of risk management.

The projects that we have identified, along with a brief of each project, is provided below:

1. Application of risk management in retirement benefits

The structure of retirement benefits may be simple, but the risks associated with them are not. Contributions made by individuals are invested in a fund and are paid back in the form of pensions when these individuals retire. The long-term nature of these investments lead to significant uncertainty, especially in relation to future investment returns, salary levels and longevity.

The AGRM expects that this project will help further develop our professions' understanding of retirement benefits. This may include the identification, quantification and mitigation of the underlying risks.

2. Credit risk

Businesses are increasingly becoming inter-dependent. We are increasingly dependent on our counterparties. But what if they default on their commitment? Can we measure this risk and include its cost in the decisions we make? Can we conduct qualitative analysis that help us make better decisions with respect to these risks?

The AGRM expects that this project will help further develop our profession's understanding of credit risks, various measurement models available and suggest a course for effective risk management.

3. Catastrophic risk modelling

Catastrophes are increasingly resulting in huge losses of lives and property, resulting in mounting losses for insurers and reinsurers. The infrequent nature of such events makes it difficult for actuaries working in this area to accurately estimate the risks involved. Can we model the risk and arrive at a reasonable price for this risk to help guide decisions at the time of underwriting?

The AGRM expects that this project will help further develop our profession's understanding of the challenges in modelling catastrophe risk and reveal a path towards developing a robust model to quantify catastrophe risk. If the team can produce a model, that would be a cherry on top!

4. Application of risk management techniques in management of fixed immediate and deferred annuities

Fixed immediate and deferred annuities are becoming increasingly popular in the Indian market. However, these products introduce a lethal combination of economic and insurance risks. Some other markets have introduced such products with mixed results and can teach us many lessons on the sound management of such products.

The AGRM expects that this project will help further develop our profession's understanding of the risk involved in writing such products and suggest practical methods to help mitigate some of these risks.

We envisage that we will create teams of two or three individuals for each project. We may increase this number if we receive a large number of requests. Each team will be allocated one senior practising actuary, who will act as a mentor. The team selected for each project will select the exact scope of their project and will provide the AGRM with a short brief of their plan. Following this, these teams will meet at regular intervals to progress each project and provide the AGRM with regular updates on their respective projects. The outcome of each project would be either a paper or a presentation on the chosen topic.

We anticipate that these projects will help participants in enhancing their skills in the area of risk management and enable them to show case your skills to the wider profession.

On the successful completion of each project, each team will be granted an opportunity to present the findings in an appropriate actuarial forum – either a capacity-building workshop, a seminar or a conference!

Please note that the intellectual property developed as part of each project will belong to the Institute of Actuaries of India.

If you are a recently qualified actuary or a student nearing qualification interested in undertaking above project or if you are a qualified actuary willing to mentor a small group of interested participants, then please email your expression of interest to hod@actuariesindia.org by 31st October 2019.

We look forward to your participation.

Sincerely,
Advisory Group on Risk Management

6th Seminar on Current Issues in General Insurance (CIGI)

Organized By: Advisory Group on General Insurance
Venue: Hotel Sea Princess, Mumbai **Date:** 29th and 30th August, 2019

Day 1

Welcome and Keynote Address

The seminar began with a Welcome Address by **Mr. Jatin Arora**. He thanked the participants, IRDAI Members and IAI President for taking out time to attend the event. He introduced the seminar and mentioned that this was aimed to cover a wide array of topics currently impacting the General Insurance Industry which included topics like Insuretech, Peer Review and Product Developments to mention a few.

Mr. Sunil Sharma, President, IAI welcomed everyone to the event. He provided an update on IAI Activities which included the recent celebrations on Actuaries Day. He mentioned the need for growth in the profession as the number of member admission in the Institute over the years had stabilized. He highlighted the 5 key Goals of the Institute in respect of the profession:

- Well recognised profession in Public Domain
- Grow members to over 30,000 in the next 3 years
- More than 750 Qualified Actuaries in next few years
- Sustainability in terms of the Institute having its own material in the next 2 years
- Enter in relevant areas like Finance/Data Science/ERM and Banking

He also provided details regarding the recent initiatives the IAI had taken in terms of launching a Job Portal, Professional video outlining the profession, plating trees and starting multiple Advisory Groups. He mentioned that there was an ideation box for students to contribute and work on the idea if there was no Advisory Group for the same.

Session: Current Challenges in General Insurance Industry and Actuarial Work

Speaker: Ms. Pournima Gupte

Ms. Gupte noted the need of actuarial work gaining wider acknowledgment that just numbers. She emphasized on the fact that the role of the Appointed Actuary was wider that numbers which included ensuring solvency, pricing philosophy consistency between teams, risk management and regulatory compliance to name a few. She urged the members to understand that Actuaries would be fit for wider roles in the companies based on their background and there was a need to involve them in more areas. In terms of issues she

highlighted particular to GI Industry:

- Non Availability of Resources of relevant experience: IRDA faces a challenge when the company is staffed by people with limited experience. All reliability cannot be on the AA alone. Work such as reserving and premium rating needs to be carried out by people with relevant experience.
- Lack of Independent Audit of Actuarial work: Auditors do not generally review the details of the Actuarial Work which would change in the next few years. There was a need to peer review the work submitted by the AA.
- RI Contract Review: As a part of Actuarial roles teams should be involved in RI Contract details and implementation.
- IFRS Implementation: Actuaries should be involved in IFRS implementation in companies.

Overall, she highlighted that there is a need for Actuaries to be involved in wider fields and increase their role to more management and business related avenues to help grow the business.

Session: CEOs Panel Discussion - Current Issues in General Insurance

Speakers: Ms. Pushan Mahapatra, Mr. Ritesh Kumar and Mr. Mahesh Balasubramanian

Moderator: Mr. Jatin Arora

The session started with the discussion on Growth of the GI business considering slowdown in Motor Industry which is a major contributor to the Premium Growth of the Industry. **Mr. Ritesh** noted that the target of 15% approximately would be achieved because other sectors were also contributing to the growth of the GI Sector let alone Motor; **Mr. Mahesh** added that there was a need for penetration and development of new products in the market but the growth would not be impacted by the current situation. **Mr. Pushan** mentioned that growth story for every company might be different but the overall level shall be achieved. The issue was more pertinent on penetration and there was a need for technology related products to be developed so as to increase the level of penetration in the market. Mr. Ritesh cited that products need to develop to focus on growth. The instalment system of Mutual Funds can be implemented in GI Industry to ease the burden of lump sum premiums on customers.

Mr. Pushan highlighted the need for more governance and discipline in the Industry. Listing of companies might be a way to achieve this which was discussed by each of the CEOs. Overall the view stood that there was a need to start looking at Bottom Line, without considering Cross Subsidy. Mr. Ritesh noted that there need to be a view on the long term rather than short term and there is a need for governance for the same. He also noted the need to be more open to customers and implementation of things like KYC in the Industry.

Later the discussion was held on Actuaries and their need in the wider areas. Mr. Mahesh highlighted that Actuaries need to gain a more business sense and commercial view of the business. Data Science and other areas are great opportunities for the Actuaries to develop and advance. Mr. Ritesh added that the Industry is data focused and everyone needs to work towards an end goal which might not necessarily mean to be an Appointed Actuary. Mr. Pushan mentioned the need to communicate effectively so that other teams can contribute and work together.

Session: Asset Management and ALM in Current Market Scenario

Speakers: Mr. Ganesh Prasad and Mr. Param Dharamshi

The first half of the session focused on the uncertainty of timing in quantum of the cash flows for liabilities. Interest Risk, Liquidity Risk, Credit Risk and a few others were highlighted as part of Risk Management. Consideration needed to be given to Reinsurance and other liabilities apart from Technical Reserves.

Mr. Prasad continued on Asset management by giving a macroeconomic view point. The impact of slowdown seen in US, China and other countries was seen to impact

the interest rates received in India. The yield of returns on assets was seen to be lower the past recent years, which highlighted the need to assess assets more realistically going forwards with decreasing Yield Rates.

Session: Changes in Motor Vehicle Act

Speaker: Mr. Sanjay Seth

The session highlighted the recent changes made in the Motor Vehicles Act and its impact on the Insurance Industries. The speaker highlighted the changes in the policy like the Golden Hour which was introduced to provide medical assistance to Customers within an hour of the accident. There was introduction of community services as a punishment to change the mindset of people. There were laws introduced to protect the Good Samaritans during an accident. A time limitation to filing of cases was introduced which would help control the delay the reporting claims in Insurance Industry. There was clarity on Drivers and Cleaners being classified as third party members. Overall the discussion was detailed and provided a view on the changes to the Motor Policy.

Session: Product Innovation

Speaker: Ms. Prabha Chokhani

The session started with discussion on the changing customer behaviour and how they have transformed to be 'Virtual Alphas'. **Ms. Chokhani** stressed on how the industry has changed to aim at consumer experience rather than only products. There is a shift in the industry towards machine learning and automation with small ticket type of claims entering the market. Use of technology like chat bots to increase fraud detections was seen. She noted the evolution in distribution channels where customers have now moved completely online. They prefer a packaged product and policy with quick results. Automation and value added services have advanced to dethrone the human effort.

Overall the session was informative on the changing scenario of Insurance Industry both from Consumer and Company point of view with the development of Technology and automation playing a major role with every passing year.

Session: Actuaries Panel Discussion - New Emerging Products

Speakers: Ms. Gayle Adams, Mr. Adarsh Agarwal and Mr. AV Kartikeyan

Moderator: Mr. Yogesh Agarwal

The session kick started with **Mr. Adarsh** highlighting the role of actuaries in new products. He mentioned regarding completely new product development in the markets along with innovation in existing products, considering satisfying the basic insurance principal. **Mr. Kartikeyan** dwelled on the aspects one needs to consider when launching new products. This included data, documentation, RI, claims, and all other areas one needs to look at before launching new products. Ms. Adams noted the automation and digitization of products. Companies were launching more of catch-up products. Machine Learning is important for all new products.

Mr. Adarsh mentioned about new innovative products in line with developing technology, for example, the rental area has developed massively in the last few years and

this can be the new market for product launches. There was a need for products like short term basis, 2 wheeler insurance, and drone insurance. There was discussion on SME segment and need for penetration in this area. **Mr. Kartikeyan** mentioned that the traditional approaches had not worked in the field and there was a requirement for technology intervention or Regulatory expert panel. The area was dominated by concentration of risks and claims were seen to be clustered. Ms. Adams added that to penetrate in rural areas the premiums needed to be small and policies should be easy to understand. **Mr. Adarsh** added that the policy wordings were written by lawyers which made them difficult to interpret and understand. There was a need for change to make things easier for customers.

Overall the session was informative and very interactive.

Day 2

Session: Panel Discussion - Underwriters - Product Standardization and Underwriting in Digital Era

Speakers: Mr. Sunil Singh, Mr. Anurag Rastogi and Mr. Pranay Shah

The session began with the discussion on the recent changes in the Industry. **Mr. Anurag** noted that long term products is an issue due to estimation of liability, fraudulent claims etc. **Mr. Pranay** noted that an option to go for long term policies is good initiative however mandate might not necessarily be good. There might be an issue with implementing for old vehicles as they would carry many more rating factors. **Mr. Sunil** noted that New India had started an initiative to teach students on how to walk on roads. Such initiatives along with license issue and vehicle registration systems need to improve to decrease the number of accident cases. Mr. Anurag noted that there had been a lack of creating awareness for 3rd Party amongst policyholders. Initiatives are being taken by Delhi Police and Andhra government to quiz children on the benefits of Insurance to educate them.

Mr. Sunil highlighted the need to be more detailed while issuing policies. The premiums need to be influenced by factors such as customer's choice of repair shop, kind of people driving the car etc. Motor pricing needs to be more standardized moving away from competitive pricing. Mr. Anurag mentioned that there was a need to price every segment properly so as there is risk selection rather than price selection in the market.

The session continued with discussion on the standardisation of products. Mr. Anurag supported the decision to standardise as most of the products as available with add-ons without any price impact. Standardization helps small and medium size customers to make a more informed choice. Mr. Pranay also supported by stating that standardization helps bridge the gap and might lead to increase in penetration levels. Mr. Puneet asked about the changes in RI Rates and Cross Subsidy in the Industry. Mr. Sunil mentioned that level playing field had come for Underwriters and there was a need to move to exposure pricing rather than premium pricing. Mr. Pranay added that there was a need to understand P/L of Insurance Company and move away from Cross Subsidy.

Overall the session was informative with detail discussions on development and the way forward for GI Industry.

Session: Peer Review in General Insurance - Learning in the last 2 years

Speaker: Mr. Khushwant Pahwa

The session started with the discussion on APS33 and the implementation to Peer review General Insurance Reserves in the past 2 years. **Mr. Khushwant** talks about the important areas one looks at when performing a Peer Review. He noted the importance to add value based on the review. A review would involve a complete check on the processes of the Actuarial Team, utilisation of the reserves, opinion on reserves and reasonableness of the reserves. Mr. Khushwant talked about the discussions

one needs to have with the Appointed Actuary and documentation of the opinion on reserves.

Overall the session was informative and concluded with discussion and debate with participation from the audience.

Session: Indian Insuretech Experience

Speaker: Dr. Prasun Aachharyya

Dr. Prasun started the session by grouping the Insurance Industry in Phases and mentioning that period post 2017 was considered Phase 4 and the disrupter of Industry through Technology. The session initially highlighted the Customer's Prism which was categorised as following:

- Communication: Attributes, benefits and value to the Consumer
- Consideration: Awareness of the GI Industry
- Conversion: Buying the product
- Classification: Intent or Opportunity based marketing to Customers

Dr. Prasun then moved to highlight the Insurer's view point. He mentioned that the traditional outset was changed by aggregators and then by the customisation of the products. The products would be moment based in the future and data was the new focus area for the Insurers.

Overall the session was extremely informative to understand the impact of changes in Technology both from Customer and Industry point of view.

Session: GIC's perspective on Indian Property Market

Speaker: Mr. Hitesh Joshi

Mr. Hitesh started by highlighting that Fire/Property had shown high volatility in the past apart from Crop Insurance. The growth seen in this sector is seen to be

about 11%. GIC has revised its rates to reflect the changing experience in the market. Frequency and Severity of the Hurricanes has increased in the past decade, whereas Earthquake which was seen to be a dominant peril has reduced significantly. Hurricanes have increased in speed/severity and intensity. Mr.Hitesh highlighted that models had failed to predict reliable scenarios and there was a need to work extensively to understand the weather impact on Property.

Overall the session highlighted the changing scenario in the Property market.

Session: Crop Insurance - Pricing Aspects and Pool as Sharing Mechanism

Speaker: Ms. Harini Kannan

The session started by discussing the various Insurance available apart from just Crop Insurance. **Ms. Harini** highlighted the key risks involved in Crop Insurance and that there were gaps in data used currently. She noted the use of technology to improve the Crop Yield predictions and also improve surveillance cost to Insurers. Currently the market was using a fit distribution for the expected losses in the product and adds a CAT and heterogeneity load to arrive at the results. There was discussion on setting up of Pool in the Country however clarity was needed in terms of

operation and control of the Pool. A few examples were cited from Countries where the Pool system had been successfully implemented.

Overall the session was informative.

Session: Learning's from IFRS 17 Gap Assessment

Speaker: Mr. Hariharan Mani

Mr. Hariharan started the session by discussion the IFRS 17 journey so far and the amendments made in the standards recently. He highlighted the significant impact for GI Industry and the need to have a closer look at the implementation of the standards in India. He noted the major areas of concerns which were the LFRC, PAA Eligibility, RI Contracts, Risk Adjustment to name a few. Mr. Hariharan also mentioned regarding the role of Actuaries in the implementation as there was a need for integration of systems and various segments.

Overall the session was interactive with audience participating through debate and deliberation.

Session: Increasing Role of Actuaries in General Insurance and beyond

Speaker: Mr. Anurag Rastogi

Mr. Anurag kick started the session by giving his background in the field of Actuarial and taking the audience through his career journey and experiences. He

pushed the actuaries in the room to understand that there were a lot more field available and open to the profession than currently explored. Mr. Anurag said that he believed areas such as Finance and Motor Underwriting could use inputs from Actuarial functions due to the background the professionals working in the field carry. There was a need to develop business skills and use analytical skills. He highlighted that learning and education for everyone does not stop at any stage of life.

Overall the session was inspiring to everyone.

Closing Remarks

Speaker: Mr. Puneet Sudan

Mr. Puneet thanked all the speakers and audience for a lively, insightful and meaningful Seminar over the past 2 days.

Written by

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"Mr. Ujjaval Agarwal is currently working as a Manager in the Actuarial Department of SBI General Insurance Company."

16th Seminar on Current Issues in Retirement Benefits (CIRB)

Organized By: Advisory Group on Pensions, Other Employee Benefits and Social Security
Venue: Hotel Sea Princess, Mumbai **Date:** 5th & 6th September, 2019

Welcome Address

Mr. Kulin Patel, Chairperson of the Advisory group, welcomed everyone and shared with the group that current seminar has beaten participation record of CIRB seminars conduced so far. He further shared the theme of the seminar "Beyond the Horizon", rationale of the theme and how the sessions are organized for the two days keeping that in mind involving external speakers and global perspective.

Mr. Sunil Sharma, President of IAI, was invited to inaugurate the seminar and address the group. He began with acknowledging the professors and senior actuaries for their contribution to bring the profession to current level and thanked the advisory group for conducting seminars.

He further suggested the group to look beyond the current capacity of work and identify new areas of service that we can provide. Reiterating his message shared on Actuaries Day, he mentioned the vision of the Institute, five big and brave goals like target to have 30,000 student members and 750 actuaries in next 3 years, experts in Data science, analytics and ERM fields.

He praised all Chairpersons and Secretaries of the advisory groups who collaborate over weekend for brainstorming sessions.

Mr. Sunil concluded the address with the statement "We have been Krishnas, let's be Arjunas now".

Session: Labour reforms in India - Labour Laws and Social Welfare

Speaker: Ms. Rituparna Chakraborty

Ms. Rituparna Chakraborty is Co-Founder and EVP of TeamLease, President, Indian Staffing Federation. Her goal is "Putting India to Work" and hence says "Not sure whether we can solve all of India's job problems, but we shall die trying."

Session Highlights

The session started with current employment status of the country and progressed into the expected increase in job creation in time to come.

Further, the speaker spoke about few of the major reasons of India being poor. To mention a few, around

50% of the population is self-employed, over 50% graduates earn less than Rs 6,500/- per month, almost half of the salary is taken away in name of mandatory deductions. Moreover, there is a disparity in distribution of job creation and suitable candidates geographically.

The speaker appreciated the fact that the writers of the Constitution of India at the time of execution were so detailed that they foresaw the issues that may arise in future and made laws for beforehand where some of the developed nations are still identifying and trying to deal with the issues. She explained that how the laws need to be reformed with time and the government is trying to combine and remove the redundant laws and bring unification in the system. She further shared with the group the compression of 44 labour laws into four codes - wages, social security, industrial relations and occupational health and safety. The Wage Code bill will be introduced soon which will extend the minimum wage law to all activities. The government is also trying to dilute many more compliances for the ease and simplicity of the laws. Currently, around 46% of the compliance filings are labour compliances.

Session: Social Security in India- Present Scenario and (Uncertain) Future

Speaker: Ms. Renuka Sane

Ms. Renuka Sane is an Associate Professor at the National Institute of Public Finance and Policy. She is also a member of the Pension Advisory Committee of the Pension Fund Regulatory Development Authority (PFRDA).

Session Highlights

The session started with emphasizing the importance of pension to finance consumption in old age and how the government is trying to ensure it by introducing social security schemes like National Pension Scheme (NPS), Employee Provident Fund (EPF) etc.

Subsequently followed the discussion on 5 major issues with the current status of the social security in India. The first issue discussed was fund management where speaker mentioned the stringent investment guidelines like cap on equity investment and international investments not allowed that reduces the scope of return on investment. Th next issue discussed was governance which detailed about lack of information available publicly, ineffective monitoring of pension funds, need for a central regulator. The next issue was coverage that mentioned that all of the social security schemes cover about 8-12% of the workforce and need to improve the coverage highlighting the challenges like reluctance of employees to contribute. The fourth issue was Annuities that doesn't have a much developed market in India and hence the money's worth ratio is not very high. Also, there is inconsistency between EPF and NPS lumpsum withdrawal policy. The last issue discussed was the state capacity that mentioned about the debt strain due to various schemes, changing the investment policies, increasing the fees and political economy of fund managers.

Concluding the session, speaker pointed out that the pension market is very small with more focus on improving the retail coverage and there is a need to focus on solving the fundamental issue.

Session: Developments from the Employees Provident Fund Organisation (EPFO)

Speaker: Mr. P. B. Verma

Mr. P. B. Verma is regional PF Commissioner-1 with twenty years of experience in various capacities in EPFO in many states.

Session Highlights

The session began with the current status of the EPF, its population size, features, benefits etc. and progressed into the changes made in recent years for the improvement of the fund and benefit of participants like reduction in admin charges from 1.1% to 0.5% and

increase in equity from 5% to 15%.

The speaker further discussed few of the cases that were highlighted due to their salary components used for PF contribution calculation like Surya Roshni Ltd vs EPF and another.

Sharing the vision of the organization, the speaker shared the target of around 45 crore active members by 2020.

Session: Market Structure and Challenges for Annuities in India (Panel Discussion)

Moderator: Ms. Chitra Jaisimha, Consulting Actuary practicing out of Mumbai

Panelists: Renuka Sane and Dr. K Sriram, Consulting Actuary engaged in Employee Benefits Consulting Practice

Session Highlights

The discussion began with the concern of the maturity of population mentioning that by 2050, more than 19% of population will be over 60 years thus creating a burden on the social security schemes and it's active members. Also, the annuity market in India is very small and not much developed.

Further, the challenges of annuity market were discussed like interest and longevity risk, low money's worth calc due to limited options available. The consideration for behavioural economics was also highlighted at the time of product design.

The requirements for good annuity market like better mortality data, long dated bonds, index linked bonds were discussed.

Concluding the session, the government's initiatives were shared like RBI issued 10 to 20 years bond more in last few years that can potentially lead to growth of annuity market in India.

Session: Introduction to Collective Defined Contribution (DC) plans - case study from Japan

Speaker: Mr. Jeff Howatt, Head of Retirement for Asia with Willis Towers Watson

Session Highlights

The session began with the need for a new solution in Japan. While only less than 40% companies are providing DB plans, more than 50% of the DC assets are invested in cash leading to less investment return.

The Collective DC plan, new in Japan, is a collectively funded pension plan where investment and actuarial risks are pooled. Further, the speaker spoke about some pros and cons of having this plan both for employer and employees. To mention a few, investment and actuarial risk transfers from employer to employee, the benefit will no longer be guaranteed but targeted. The speaker also shared few of the key issues like design, communication, governance etc.

A case study was shared for a plan that moved from DB to collective DC highlighting the new plan design and asset allocation changes and the financial impact of the change in the financial books.

Session: Long-term Financial Security - A Consumer's Perspective

Speaker: Ms. Mrin Agarwal

Ms. Mrin Agarwal is a financial educator & a licensed money mentor with an experience of more than 20 years in wealth management industry.

Session Highlights

The speaker opened the session with the need for financial welfare awareness programs where she spoke about how financial stress impacts health, productivity and workforce management of employees that as a

result impacts employer and how wellness engagement programs help employees and hence employer to attract and retain the talent, increase the productivity and efficiency and help employees plan their retirement in an effective way.

Talking about current spending and savings, the speaker mentioned that most employees save less than 25% of their take home salary, unsecured loans have seen significant increase in last three years. More than 50% of the household still want to rely on children after their retirement.

The inadequate knowledge on investments also leads to insufficient funds at the time of retirement and no formal financial advice is taken or considered at the time of planning. Talking about more challenges, traditional risk averse investments that do not beat inflation, focus is on tax planning than investing and too many loan options available and not involving family in financial planning are few more.

Talking further, the speaker mentioned how employers are taking initiatives to improve financial well-being of employees and how this has worked for and against.

Concluding the session, Ms. Mrin mentioned that there is a need to change mindset of people and how employers play an important role in that as employees trust their employer.

Session: Environmental, Social and Governance (ESG) Investing in India - a pension fund perspective

Speaker: Mr. Amit Gopal, Business Leader of Mercer's Investments business in India

Session Highlights

The speaker initiated the discussion with some background on ESG and other common terms used in context. He further shared how the concerns about environmental risks have increased over last ten years.

Talking about India, he mentioned why ESG investing is not popular and the mindset of people.

Mr. Amit concluded the session with how pension funds can invest in ESG and how the investment returns are increasing on these funds as people are becoming more aware. However, there are some challenges to invest in pension funds like absence of data and expertise in India, strict investment regulation etc.

Session: Liability Driven Investment in Pension funds

Speaker: Dr. K Sriram

Session Highlights

The session commenced with some background of funded status of US DB pension plans and options to improve it. The speaker shared few of the ways to deal with two of major risks: interest rate risk and longevity risk.

After the quick brief, the discussion moved towards LDI philosophy which is to maximise the assets performance relative to liabilities. The key considerations to implement LDI were discussed from choice of hedging instruments to risk appetite and choice of funds.

From Indian context, the challenges to implement LDI were highlighted like mandated investment strategies, restricted market for swaps in India etc.

Concluding the session, speaker emphasized on the importance of considering natural hedges that may be available which can partly offset the liability risks.

Session: Data privacy demands in employee benefits valuation

Speaker: Ms. Inderjot Dang, Chief Compliance Officer for Mercer India

Session Highlights

"Data is cash these days" was one of speaker's initial statements to draw attention of the audience towards the importance of data privacy. The actuaries work with sensitive and PI data which when used responsibly can benefit everyone, however, if misused can lead to adverse consequences and it is obligatory for actuaries to protect data.

The speaker shared how the global status of laws and regulations that require everyone to comply with legal provisions of data protection is evolving and there has been a 100% increase in laws in last 10 years. Talking about India, there is a new law proposed which will soon be passed and breachers will be penalised strictly along with reputation damage, lost clients and trust.

The speaker further shared few of the incidents where data breach happened and the consequences followed.

Concluding the session, speaker reiterated that it is each and every individual's responsibility to protect data and report if there is a breach and the effective compliance will give business a competitive advantage.

Session: Global developments in actuarial (funding/investment strategies) compliances

Speaker: Mr. Hemant Kumar, Leader of Actuarial function in Principal Global Services, Pune

Session Highlights

The session commenced with the demographic evolution of maturity of social security schemes and its participants that showed that by 2050, most of the countries will have more than 20% population over age 65. Further, the Global pension index ranking of various countries was shared from Netherlands at rank 1 with pension index of 80 to India at rank 33 with index of 45.

The impact of 2008 crisis on funded status of pension plans was discussed progressing into the need to have diversification of funds globally with increased percentage of alternative assets and how the investment strategies have advanced over years comparing trends of various countries mentioned under global pension index ranking.

The speaker mentioned that limits set by investment regulations of pension funds globally have softened over time allowing more discretion further highlighting the need of sound governance.

Session: Case study of actuaries and social security

Speakers: Mr. Ritobrata Sarkar, Consulting Actuary and Head of Retirement Practice India for Willis Towers Watson

Mr. Suranjan Banerjee, Consulting Actuary for Willis Towers Watson

Mr. Harsh Agarwal, Retirement Consultant for Willis Towers Watson

Session Highlights

The team presented their case study on first actuarial valuation of Atal Pension Yojana (APY) completed by Willis Towers Watson. The session started with brief

background of the scheme and progressed into the need for an actuarial valuation.

As the scheme offers a minimum guaranteed benefit, the purpose of the valuation was to estimate the funded status of the scheme and provide insights on future status. In addition, the PFRDA was provided with information on any modifications into the scheme, e.g., higher benefit introduction impact, contribution for the extended ages.

The team shared with the audience that one of the main challenges was to deal with the huge dataset consisting of more than 9 million subscribers and it was interesting to know how they modelled the data to form homogeneous groups based on various factors like age, sex etc. After data, setting up assumptions was another task as it involved lot of discussions with PFRDA. They also shared the basis of the assumptions used.

Towards the end of session, team discussed few learnings not specific to actuarial valuation but for the whole project undertaken and completed by them.

Session: New mortality table- readiness to implement

Speaker: Mr. P K Dinakar, Appointed Actuary at PNB MetLife India Insurance Company Ltd

Session Highlights

The speaker shared with the group basis of the new mortality table IALM 2012-14 effective from 1st April, 2019 in detail talking about the dataset used provided by 24 insurance companies, assumptions set, graduation method etc.

Comparing the table with IALM 2006-08, the speaker mentioned that the new rates are lighter for all ages up to 75 except for ages 12-21 due to shift of accident hump.

Session: PEBSS Advisory Group Presentation on Developments and Way forward

Speakers: Ms. Preeti Chandrasekhar, Wealth and Health leader of business for Mercer in India

Mr. Kartikey Kandoi, Actuary at M/S. K. A. Pandit

Session Highlights

The speakers shared the key conclusions drawn from feedback from last CIRB seminar like more visibility, new areas of work to name a few and the initiatives taken by the advisory group to meet those.

Talking about goals, they shared some of the focus areas going forward that included research on key relevant topics, liaison with external stakeholders like ICAI, Labour ministry etc to have more visibility of the profession and enablement through CIRB, webinars etc.

There will be more articles published on latest accounting standard, mortality table and wages definition in the time to come to have better understanding of the changes impacting the industry.

Written by

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"Ms. Noopur is a student actuary working with Principal Global Services, Pune on US Pension funding and accounting valuations for DB clients."

Climate change

Climate change is, the warming of the world's climate system, including its atmosphere, oceans, and land surfaces. The rise in average global temperatures can be attributed to increasing levels of atmospheric carbon dioxide emissions (and other greenhouse gases, or GHGs) originating from significant increases in combustion of fossil fuels particularly in the energy and transport sectors, agriculture (e.g. livestock), and industrial processes (e.g. cement).

As the world's population grows and the global economy expands, the Earth's natural carbon dioxide "sinks" - such as large forests -decreases, meaning that there is a reduced capacity for the absorption of carbon dioxide through natural systems.

If no action is taken, the rise in temperatures could exceed 4 °Celsius (relative to pre-industrial levels) by the end of the century. This is great cause for concern as global warming greater than 2 °Celsius could have a catastrophic and irreversible impact on the planet.

Climate change is accelerating at an unprecedented rate. Global average air temperature has risen by about 0.8 °Celsius since 1900, with 2018 being the hottest year in the past decade. Impacts associated with global warming have led to a 20 cm rise in sea levels since 1901.

Climate-induced catastrophic events around the globe have focused the attention of governments and businesses, particularly insurers, on understanding the implications of climate risks. **Increasingly, insurers are considering climate risk as a core business issue.** They are exposed to a range of financial risks arising from climate change, from unexpected increase in insurance claims frequency and severity to suffering severe losses in climate-unfriendly investments.

Climate change impacts the frequency, severity and distribution of hurricanes, floods and wildfires. Scientific evidence indicates that the proportion of destructive hurricanes has increased at a rate of 25-30% per 1° Celsius of global warming.

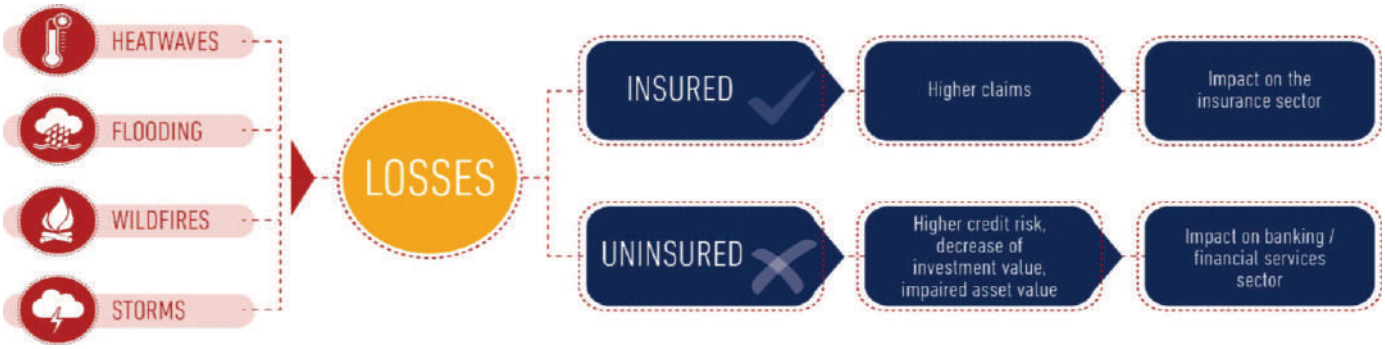
The impact of climate risk on Insurers

Climate risks impact all areas of society including financial services and capital markets. Insurers are inherently susceptible to threats from climate change, and adjusting their underwriting and investment strategies can facilitate the effective management of their climate risk exposure.

Climate risks pose a threat to the insurers' investment strategy as the profitability of insurers' investment portfolios may be affected. This could lead to an adverse impact on insurers' ability to pay future claims.

Climate risks are broadly classified into Physical risks, Transition risks and Liability risks.

These risks have an impact on Underwriting activities of both General and Life Insurance businesses and also on investment activities.



Ways to monitor Climate Risks

- **Climate Risks in Risk Frameworks**

Risk frameworks provide information on how firms manage and monitor risks in general. Climate change does not create new categories of financial risk but can manifest itself in existing risk categories such as underwriting and reserving risks.

Climate risks may heighten insurance risk exposures of non-life insurers more than life insurers. However, one may take the view the climate risks give rise to the same level of strategic and reputational risks of all insurers regardless of whether they are life or non-life insurers.

- **Stress Test**

One can use stress tests to assess the resilience of the insurance sector to climate risks. From a climate change perspective, such stress tests would consider weather-related natural disasters like hurricanes and windstorms, which may be aggravated by climate change. More specifically, this means reflecting the increased likelihood and severity of extreme weather patterns in the stress tests.

- **Assessing Transition Risks**

Quantifying the financial impact of transition risks on insurers' investment portfolios can be an extremely difficult and complex task. For example, it may not always be clear which financial assets are considered 'high-carbon'. A possible solution is to consider revenue-based metrics by examining revenues derived from carbon-intensive activities of the firm.

- **Scenario analysis**

Climate risks have long-term repercussions and it is important to understand how insurers may be impacted by climate risks in the future. To examine the potential future impact, one can consider different climate scenarios over longer timeframes. For this purpose, scenario analysis is useful to look for trends rather than shocks.

Scenario analysis is particularly useful to explore how insurers' investment portfolios may be impacted by different market, policy, technological or social changes associated with the transition risks to a low carbon future.

Written by

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"Mr. Simon Yeung is a Director at Mazars Actuarial. He is an expert specializes in advising clients in the general insurance sector."

Events scheduled in the upcoming months

4th Seminar on Data Science and Analytics on 02 Nov, 2019 in Hotel Ramada Gurgaon Central, Gurugram

4th Capacity Building seminar on IFRS 17 on 06 Nov, 2019 in Hotel Holiday Inn, Mumbai

2nd Capacity Building Seminar on Enterprise Risk Management (CB ERM) on 13 Nov, 2019 in Hotel Sea Princess, Mumbai

32nd India Fellowship Seminar on 05 Dec - 06 Dec, 2019 in Hotel Orchid, Mumbai

7th Capacity Building Seminar in Health and Care Insurance (7 CBHCI) on 13 Dec, 2019 in Hotel Ramada Gurgaon Central, Gurugram

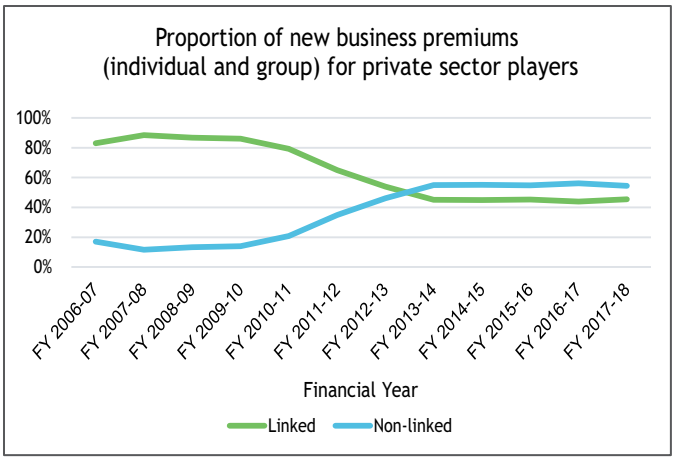
15th Seminar on Current Issues in Life Assurance (CILA) on 19 Dec-20 Dec, 2019 in Hotel Sea Princess, Mumbai

For more information visit www.actuariesindia.org

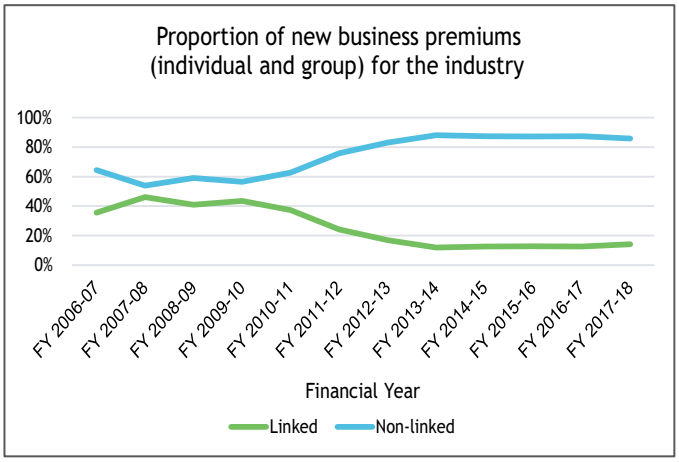
The product landscape in the Indian life insurance industry – are we on the right path?

Background

The product strategies adopted by the Indian life insurance industry have seen a significant change over the past 19 years. When the private sector insurers started business in 2000-2001, most adopted a similar product strategy to the Life Insurance Corporation of India (LIC), offering traditional participating endowments. Unsure as to whether the market was ready for a new range of products, the initial new entrants chose to base their business plans on product strategies that were largely in line with that adopted by the LIC and thus developed a traditional range of products that were priced in the high interest rate environment prevailing around 2000-2001.



Source: IRDAI disclosures



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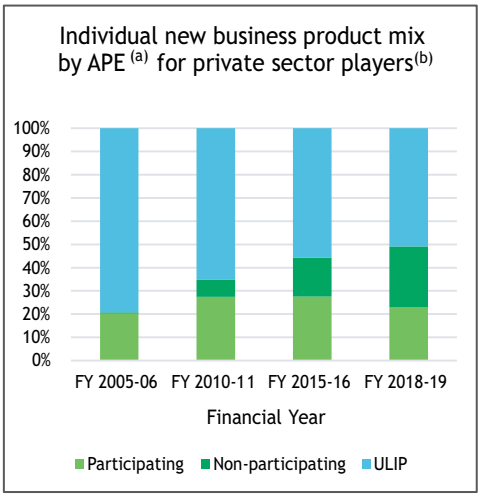
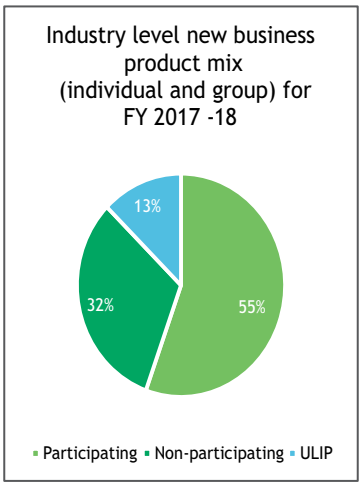


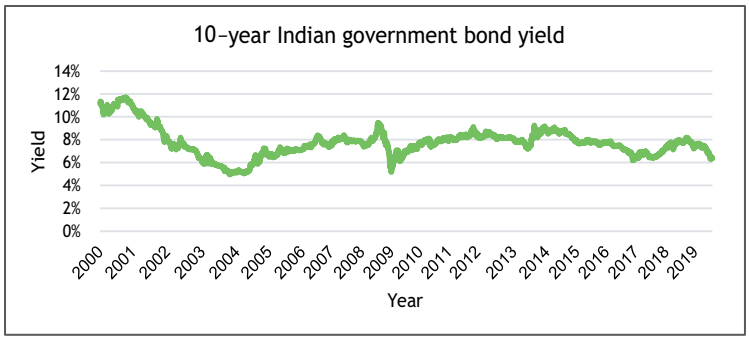
Source: Disclosures by insurers and internal analysis
Note:
(a) APE represents 100% of premiums from regular premium policies and 10% of single premiums.
(b) The above chart is in respect of the following insurers who have disclosed their segment-wise split for the given years:
- FY 2005-06: Max Life, Bajaj Allianz Life
- FY 2010-11: Max Life, Bajaj Allianz Life, ICICI Prudential Life, HDFC Life
- FY 2015-16, FY 2018-19: Max Life, Bajaj Allianz Life, ICICI Prudential Life, HDFC Life, SBI Life, Kotak Mahindra Life



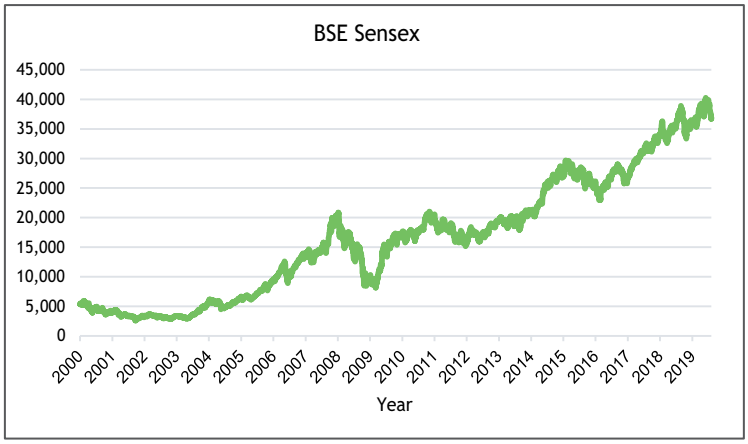
Source: IRDAI disclosures

However, a few years later, interest rates declined sharply, forcing insurers to revisit and lower bonus rates in their range of participating products, soon after the business was sold. During the same period, a handful of new players launched their operations with a different product strategy, with a focus on selling unit-linked insurance plans (ULIP) and unitised with-

profits plans (UWP). Seeing the early success of ULIPs from such players and helped by the buoyant stock markets at that time, most insurers soon switched their focus to ULIPs. Soon, almost the entire private sector industry had a product strategy that was focused solely, or predominantly, on ULIPs.



Source: https://www.investing.com/rates-bonds/india-10-year-bond-yield-historical-data



Source: Bombay Stock Exchange historical data

The aggressive growth that the industry achieved through this strategy did, however, lead to some questionable sales practices among distributors, resulting in high levels of lapses in early policy durations, giving poor value to such terminating policyholders. This led to the Insurance Regulatory and Development Authority of India (IRDAI) introducing ULIP regulations in 2010, which placed limits on the various charges that can be levied on ULIPs. Although this helped to address the poor value to policyholders terminating policies early, the limits on charges specified by the IRDAI significantly reduced the profitability and attractiveness of ULIPs to shareholders.

The restrictions on ULIP charges also meant that insurers were unable to provide the same levels of compensation to their distributors. In contrast to ULIPs, distributor compensation levels for traditional products continued to be at a higher level. Consequently, many distributors switched their focus and started again to focus more on traditional participating products. Some insurers also started to develop traditional non-participating products that offered longer term investment guarantees, encouraging distributors to sell such products as they offered higher levels of profitability.

With the benefit of hindsight, the intervention by the IRDAI in 2010 was expected and, in a way, necessary, to arrest the bad sales practices that were prevailing in the market at that time. However, it is worth standing back to ask ourselves the following questions -

a. Have the 2010 ULIP regulations achieved the desired impact on the industry?
b. What are the unintended outcomes?
c. What needs to be done to develop the industry going forward?

In this article, we will try to answer these questions in a holistic manner.

Mis-selling and high lapse rates

It is worth clarifying that for the pre-2010 ULIPs, although surrendering policyholders would have received poor value for money, had they continued for the entire term, the resulting return or internal rate of return (IRR) would not have been low. The poor value for money from pre-2010 ULIPs was the outcome of a market conduct issue (i.e. mis-selling) on the part of the distributors, rather than the product itself offering fundamentally low investment returns, if held to maturity. In other words, pre-2010 ULIPs were not unattractive for policyholders seeking to hold the policy to maturity.

13th month lapse rates across the industry for different financial years

	FY 2010-11	FY 2012-13	FY 2014-15	FY 2016-17	FY 2018-19
Minimum	15%	18%	19%	14%	13%
Average	33%	37%	35%	29%	22%
Maximum	47%	60%	64%	52%	34%

Source: Disclosures by insurers and internal analysis

For many insurers, even today lapse rates continue to be high despite distributors switching to selling traditional products. Even in ULIPs, there continue to be instances of distributors mis-selling even after the 2010 regulations capping the charges.

Over the years, many insurers have taken steps to control high lapse rates. Indeed, lapse rates in the industry today are relatively better (lower) than prior to 2010 even for traditional products, where the surrender values continue to be low.

Given this, one could argue that the improvement in lapse rates has not been entirely due to the 2010 ULIP regulations, but instead have been the result of other factors such as internal pressures on management to improve profitability, achieve expense efficiency and ultimately improve shareholder valuations. In other words, one may argue that the companies would have ultimately addressed the high lapse rates even in the absence of the 2010 ULIP regulations. One may also argue that the regulatory intervention could have been more direct, by taking action against the questionable market conduct of the distributors, rather than indirect by placing lower limits on the charges (including surrender penalties) on ULIPs.

One consequence of these events can be evidenced by a significant reduction in the share of ULIPs in the industry with several insurers now selling traditional products – participating and non-participating. Could this also have been one of the objectives of the IRDAI when introducing charge caps on ULIPs?

Traditional products vs. ULIPs

So what is more suitable for Indian consumers – traditional products or ULIPs? We believe that different consumers may have different needs and consequently different products may be suitable. Indeed, in some other markets (for example, in Singapore and Malaysia), both types of products co-exist, serving different segments of the market. It is precisely for this reason that we believe that when some distributors are unwilling to sell ULIPs (e.g. due to low commission rates on such products) and are, instead, selling traditional products, such a strategy may not necessarily be in the best interest of all customers.

Given the investment restrictions applicable on funds backing the traditional products, the investment return that a life insurance company can expect to earn on the assets backing such business is much lower (potentially around 7% - 7.5% p.a. in the current environment) than what could be earned on assets backing ULIPs (say around 9.5% - 10% p.a. or even higher on equity oriented funds, in the current environment). This, added to the restrictions on charges on ULIPs means that the investment returns to policyholders on maturity of their policies may be much higher on ULIPs (around 7% - 7.5% p.a., in the current environment) as compared to that on traditional products (not more than 6.5% p.a. on certain products, but typically much lower than this level – around 4% - 5.5% p.a., in the current environment), albeit the policyholders may value the guarantees in traditional products.

Thus, purely from the perspective of policyholder's internal rate of return (IRR), ULIPs are expected to offer a better return at maturity than traditional plans. Given this, a product strategy focused only (or predominantly) on traditional products may not be in the best interest of all consumers.

Increased risks and other issues

Apart from expecting to deliver a lower maturity IRR to the policyholders (albeit with underlying guarantees), the current product landscape also poses the following issues –

1. Traditional participating products

- The less transparent nature of the traditional participating products may not be in the best interests of consumers in the long run.
- At the same time, shareholders are permitted to take a maximum of 10% of the surplus arising from such products (with the remaining 90% being passed to policyholders in the form of bonuses). Thus, from shareholders' perspective, such products are less attractive than the products where shareholders can take 100% of surplus arising.

2. Traditional non-participating products

- The longer term investment guarantees offered on these products may result in the insurer being exposed to significant investment risk. Although in theory, such risks can be hedged by investing in appropriate derivative contracts, in practice, the ability of companies to hedge these risks is severely restricted in India due to the lack of appropriate instruments in an under-developed derivatives market.
- If a sustained low interest rate scenario materialises (in 2003, the 10 year government bond yield in India had fallen to a low level of approximately 5%), then the insurance industry may be exposed to the risk of reduced profitability, with pressure on solvency and potential capital calls.

3. **ULIPs -**

- Compared to traditional products, the new business strain on ULIPs is high (largely as a result of the distribution costs that are higher than the low level of charges). This, together with the high lapse rates (albeit improving gradually in many insurers), leads to levels of profitability that are much lower than other products.

- Reputational issues for the industry if equity markets do not perform well and ULIPs fail to deliver appropriate returns to the policyholders, as many may perceive products offered by the insurance industry as 'safe'.

4. **Protection -**

- Although these are relatively simple products for the consumer to understand, distributors may be unwilling to sell such products given the low ticket size and consequently low commissions. The low ticket size also means that insurers find it difficult to focus entirely, or predominantly, on such products, as the premium volumes do not meaningfully support the high levels of fixed costs.

Thus, the 2010 ULIP regulations may have inadvertently pushed the Indian life insurance industry into offering a range of products that are less transparent for the consumers, and less profitable and riskier for the shareholders in the long run.

Suggested steps

There are a number of steps that can be considered by the IRDAI / insurers / other stakeholders in order to ensure that the life insurance industry is further developed and achieves a profitable growth in the medium to long term. These include:

1. **Focus on the basics -** Insurers should continue to enhance their focus on the basics – controlling costs, managing the risk of 'mis-selling' and improving persistency rates, and managing the underwriting and claims process. This will enable a strong foundation for selling an appropriate suite of products to consumers that meet their needs.

2. **Explore hedging arrangements for long-term investment risks -** Insurers should actively look for opportunities to hedge the long term investment guarantees being offered through their traditional non-participating products.

3. **Enhance transparency and the governance structure to support the sale of traditional participating products -** The enhanced scope of the With Profits Committee that has been introduced in the IRDAI (Non-Linked Insurance Products) Regulations, 2019 is a welcome step. However, the insurers and the IRDAI may need to take further steps to ensure that the level of transparency in and policyholders' understanding of participating products is enhanced.

4. **Other steps by the IRDAI may include:**

a. **Relaxation on investment norms -** For example, allowing a higher proportion of corporate bonds / equity investments, enhancing the scope of derivative contracts, allowing third party funds to be offered etc. Such changes may allow insurers to potentially generate higher investment returns that can be passed on to the policyholders.

b. **Re-visiting the 90:10 profit sharing rules in participating business -** In several other markets, there are no such regulatory restrictions on sharing of profits between policyholders and shareholders. Although it may not be entirely desirable in the current environment to revisit these restrictions, the IRDAI may consider revising these in order to improve the overall profitability of the business.

c. **Introduction of risk based capital (RBC) -** This may greatly help in rewarding efficient companies who have a tighter control on their business and risk management area covering insurance risks, market / ALM risks and operational risks. This may also remove some of the anomalies in the existing solvency regime (e.g. a higher level of prudence in reserves may lead to a higher level of required capital), thereby improving the shareholders' return on capital.

d. **Rationalise the charging structure in ULIPs (e.g. relax the early year surrender penalties), but enhance controls to minimise instances of mis-selling -** One could argue the current regulations promote the wrong behaviour amongst policyholders by allowing them to lapse / surrender early, without much financial penalty. Rationalising the early year surrender penalties may help insurers offer adequate compensation to its distributors, thereby allowing the growth of the ULIPs business again. Perhaps, this may help achieve a more balanced portfolio, reflecting preferences of diverse consumer segments in India.

It may not be advisable for the life insurance industry to expose itself to longer term interest rate risk. Steps such as those set out above may help the industry to rebalance its product portfolio, which may be skewed

currently in many insurance companies towards offering products providing longer term guarantees that are unhedged. The recently introduced 2019 products regulations would appear to be open to permitting index-linked products, although this is yet to be tested. If permitted, this would be a welcome step as insurers may be able to decrease their exposure to interest rate risk by offering such products.

Conclusion

Prompted by the 2010 ULIP regulations, the shift away from ULIPs in many life insurers has resulted in them focusing more on less transparent traditional participating products, and being exposed to interest rate risk through the sale of fully guaranteed non-participating products. At the same time, the traditional products result in proving lower IRRs (albeit with guarantees) to the customer vis-à-vis ULIPs.

To support sustainable growth of the industry and to protect the interest of customers over the long run, the following steps are suggested:

- Focus on the basics - controlling the costs, improving persistency and managing the underwriting and claims processes;
- Explore arrangements to hedge the long-term investment guarantees offered in the non-participating products;
- Enhance the transparency and governance framework of participating products;
- Take regulatory steps such as revisions to the profit-sharing restrictions on participating products, investment norms and introduction of RBC framework for solvency measurement; and
- Revisit the merits of amending the ULIP charging structure to make the products more attractive to both distributors and shareholders, in order to promote the sale of ULIPs and to stimulate growth.

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The Actuary India wishes many more years of healthy life to the Associate members (above 60) whose Birthday falls from January 2019 to October 2019

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Healthcare Systems Compared

Introduction

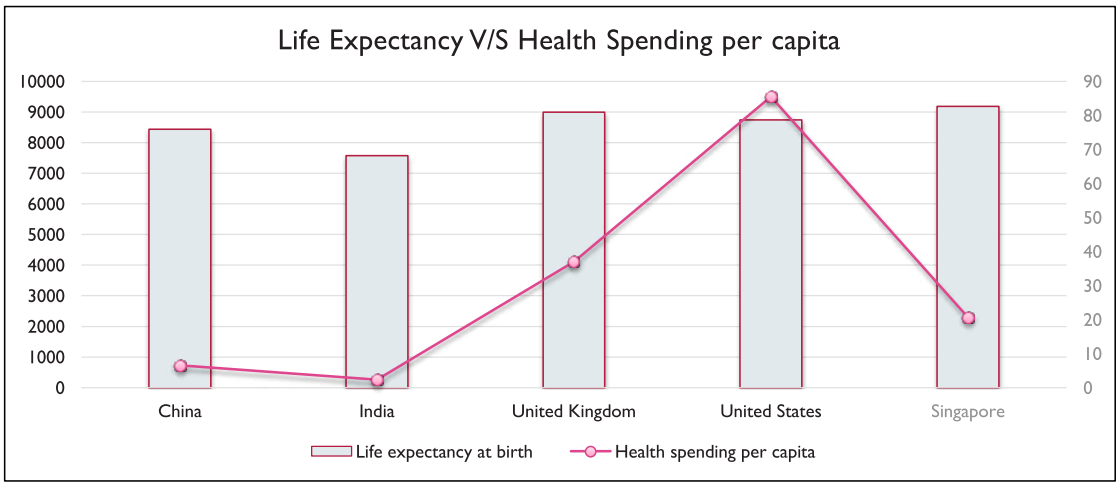
The World Health Organization (WHO), the directing and coordinating authority for health within the United Nations system, is promoting a goal of universal health care: to ensure that all people obtain the health services they need without suffering financial hardship when paying for them.

Health systems can vary substantially from country to country, and in the last few years, comparisons have been made on an international basis. **The World Health Organization, in its World Health Report 2000**, provided a ranking of health systems around the world according to criteria of the overall level and distribution of health in the populations, and the responsiveness and fair financing of health care services.

The goals for health systems, according to the WHO's World Health Report 2000 – Health systems: improving performance are:

1. Good Health
2. Fair Financial Contribution
3. Responsiveness to the expectations of the population

Direct comparisons of health statistics across nations are complex. The Commonwealth Fund, in its annual survey, "Mirror, Mirror on the Wall", compares the performance of the health systems in Australia, New Zealand, the United Kingdom, Germany, Canada and the United States Its 2007 study found that, **although the United States system is the most expensive, it consistently underperforms compared to the other countries.** A major difference between the United States and the other countries in the study is that the United States is the only country without universal health care.



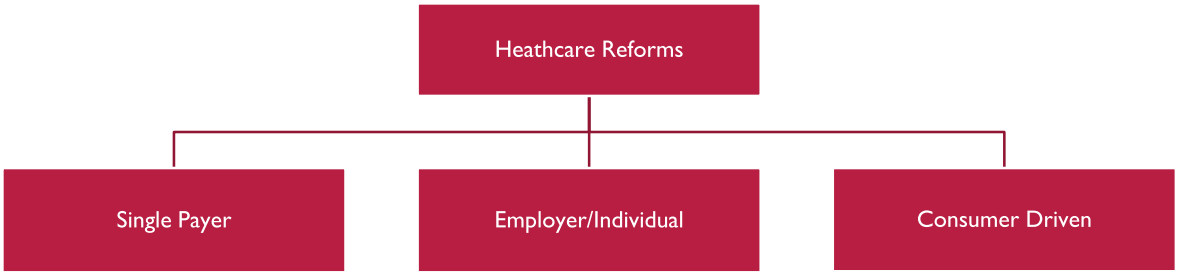
As it is clear from the above given graph, The United States spends the most on Healthcare than the rest of the countries compared here and India spends the least. Singapore has the highest Life Expectancy among all these countries.

This data is taken from OECD Health Statistics 2017. Now let's take a closer look into the Healthcare systems of the countries individually.

The US Healthcare System

The United States currently operates under a **Mixed Market** health care system. Government sources (federal, state, and local) account for **45%** of U.S. health care expenditures. Private sources account for the remainder of costs, with

38% of people receiving health coverage through their employers and **17%** arising from other private payment such as private insurance and out-of-pocket co-pays.



Health care reform in the United States usually focuses around three suggested systems. First is **Single-payer**, a term meant to describe a single agency managing a single system. Second are **employer or individual insurance mandates**. Finally, there is **consumer-driven health**, in which systems, consumers, and patients have more control of how they access care. Over the past thirty years, most of the nation's health care has moved from the second model operating with not-for-profit institutions to the third model operating with for-profit institutions. **In the US, 12% to 16% of the citizens do not have health insurance. The United States is alone among developed nations in not having a universal health care system**. Together, these tax-financed programs cover 27.8% of the population and make the **government the largest health insurer in the nation**. The U.S. also spends **17.1% GDP** per year on healthcare, more than double the nearest developed nations expenditure.

Healthcare in the U.S. does, however, have significant **Publicly funded components**: -

- **Medicare:** It provides health insurance for Americans aged 65 and older, younger people with some disability status as determined by the Social Security Administration, as well as people with end stage renal disease and amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease).
- **Medicaid:** A federal and state program that helps with medical costs for some people with limited income and resources. Medicaid is the largest source of funding for medical and health-related services for people with low income in the United States.
- The Children's Health Insurance Program **(CHIP)** - formerly known as the State Children's Health Insurance Program (SCHIP) that provides matching funds to states for health insurance to families with children. The program was designed to cover uninsured children in families with incomes that are modest but too high to qualify for Medicaid.
- **The Veterans Health Administration** directly provides health care to U.S. military veterans through a nationwide network of government hospitals.
- **TRICARE:** formerly known as the **Civilian Health and Medical Program of the Uniformed Services (CHAMPUS)**, is a health care program of the United States Department of Defense Military Health System. Tricare provides civilian health benefits for U.S Armed Forces military personnel, military retirees, and their dependents, including some members of the Reserve Component.

The UK Healthcare System

The four countries of the United Kingdom have separate but co-operating public health care systems that were created in 1948: in England the public health system is known as the **National Health Service**, in Scotland it is known as **NHS Scotland**, in Wales as **NHS Wales (GIG Cymru)**, and in Northern Ireland it is called **Health and Social Care in Northern Ireland**. Most healthcare in England is provided by the **National Health Service (NHS)**, England's publicly funded healthcare system.

All four provide state-paid healthcare to all UK residents, paid for from general taxation. Though the **public systems dominate**, private health care and a wide variety of alternative and complementary treatments are available for those who have private health insurance or are willing to pay directly themselves. Since health care delivery is a devolved matter, considerable differences are developing between the systems in each of the countries. In UK, the total expenditure on healthcare as a proportion of **GDP in 2016 was 9.76%.**

In a 2014 report by the Commonwealth Fund ranking developed-country healthcare systems, the **United Kingdom was ranked the Best healthcare system in the world** overall and in the following categories: **Quality of Care (i.e. effective, safe, coordinated, patient-oriented), Access to Care, Efficiency, and Equity.**

The exit of the United Kingdom from the European Union can make an impact on the healthcare industry if there is a no

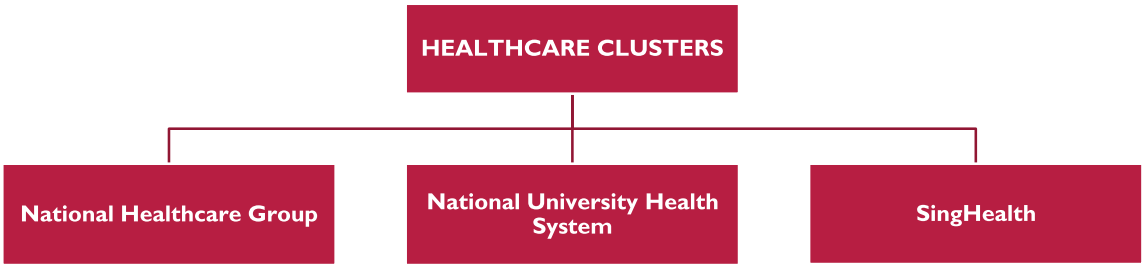
deal Brexit. There are speculations that the supply of medicines to the UK will be hit. As a precautionary measure, the government has asked the drug companies to stock up a six-week supply of medicines and make arrangements for their storage.

The majority of funding for the NHS comes from general taxation, and a smaller proportion from national insurance (a payroll tax). The NHS also receives income from copayments, people using NHS services as private patients, and some other minor sources. Coverage is universal. All those "ordinarily resident" in England are automatically entitled to NHS care, largely free at the point of use, as are nonresidents with a European Health Insurance Card. For other people, such as non-European visitors or undocumented immigrants, only treatment in an emergency department and for certain infectious diseases is free.

Private insurance offers more rapid and convenient access to care, especially for elective hospital procedures, but most policies exclude mental health, maternity services, emergency care, and general practice.

Healthcare System in Singapore

Healthcare in Singapore is supervised by the Ministry of Health of the Singapore Government. It largely consists of a government-run universal healthcare system with a significant private healthcare sector. In addition, financing of healthcare costs is done through a mixture of direct government subsidies, compulsory savings, national healthcare insurance, and cost sharing.

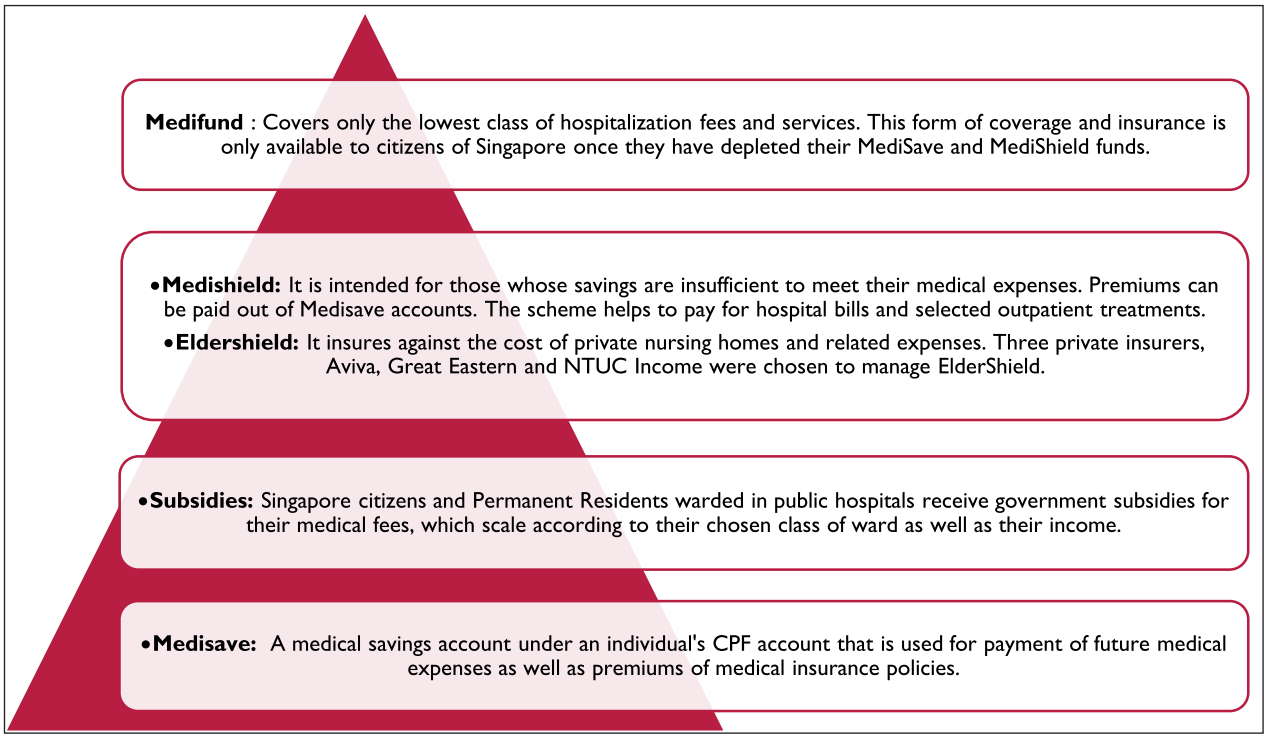


Approximately **70-80% of Singaporeans obtain their medical care within the public health system**. Overall government spending on public healthcare amounts to **4.47% of annual GDP**.

Singapore has an incredible reputation for health services and healthcare systems; in **2000, the country was ranked sixth in the world by the World Health Organization.** Public hospitals have autonomy over management decisions, and compete with one another for patients. Singapore's healthcare system uses a mixed financing system that includes **Nationalized life insurance schemes** and deductions from the compulsory savings plan, or the **Central Provident Fund (CPF)**, for working Singaporeans and permanent residents.

Publicly financed health care: Coverage is funded through a combination of government subsidies (from general tax

revenue), multilayered health care financing schemes, and private individual savings, all administered at the national level. National capital expenditures are set in the government's annual budget.



Healthcare System in India

The Constitution of India makes healthcare in India the responsibility of the state governments, rather than the central federal government.

The National Health Policy was endorsed by the Parliament of India in 1983 and updated in 2002 and then in 2017. The recent four main updates in 2017 mentions the need to focus on the growing burden of the non-communicable diseases, on the emergence of the robust healthcare industry, on growing incidences of catastrophic expenditure due to health care costs and on rising economic growth enabling enhanced fiscal capacity.

In practice, however, **private healthcare sector is responsible for the majority of healthcare in India**, and most healthcare expenses are paid out of pocket by patients and their families, rather than through insurance. Government health policy has thus far largely encouraged private sector expansion in conjunction with well-designed but limited public health programs.

There has been an ambitious healthcare project launched in the year 2018, which is perhaps one of the **biggest government funded healthcare insurance, called Ayushman Bharat**.

According to the World Bank, the total expenditure on health care as a proportion of **GDP in 2016 was 3.66%**.

Despite being one of the most populous countries, **India has the most private healthcare in the world**. Out-of-pocket private payments make up 75% of the total expenditure on healthcare. **Only one fifth of healthcare is financed publicly.** This is in stark contrast to most other countries of the world. According to the World Health Organization in 2007, India ranked 184 out of 191 countries in the amount of public expenditure spent on healthcare out of total GDP.

Initiatives to improve access

The Twelfth Plan

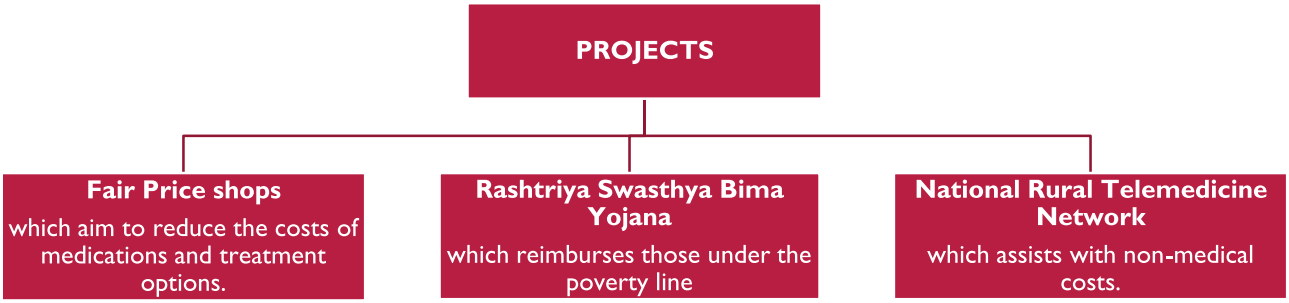
The government of India has a Twelfth Plan to expand the National Rural Health Mission to the entire country, known as the **National Health Mission**. Community based health insurance can assist in providing services to areas with

disadvantaged populations. Additionally, it can help to emphasize the responsibility of the local government in making resources available.

Public-private partnership

One initiative adapted by governments of many states in India to improve access to healthcare entails a combination of public and private sectors. The Public-Private Partnership Initiative (PPP) was created in the hopes of reaching the health-related Millennium Development Goals.

It consists of three separate projects with different focuses:

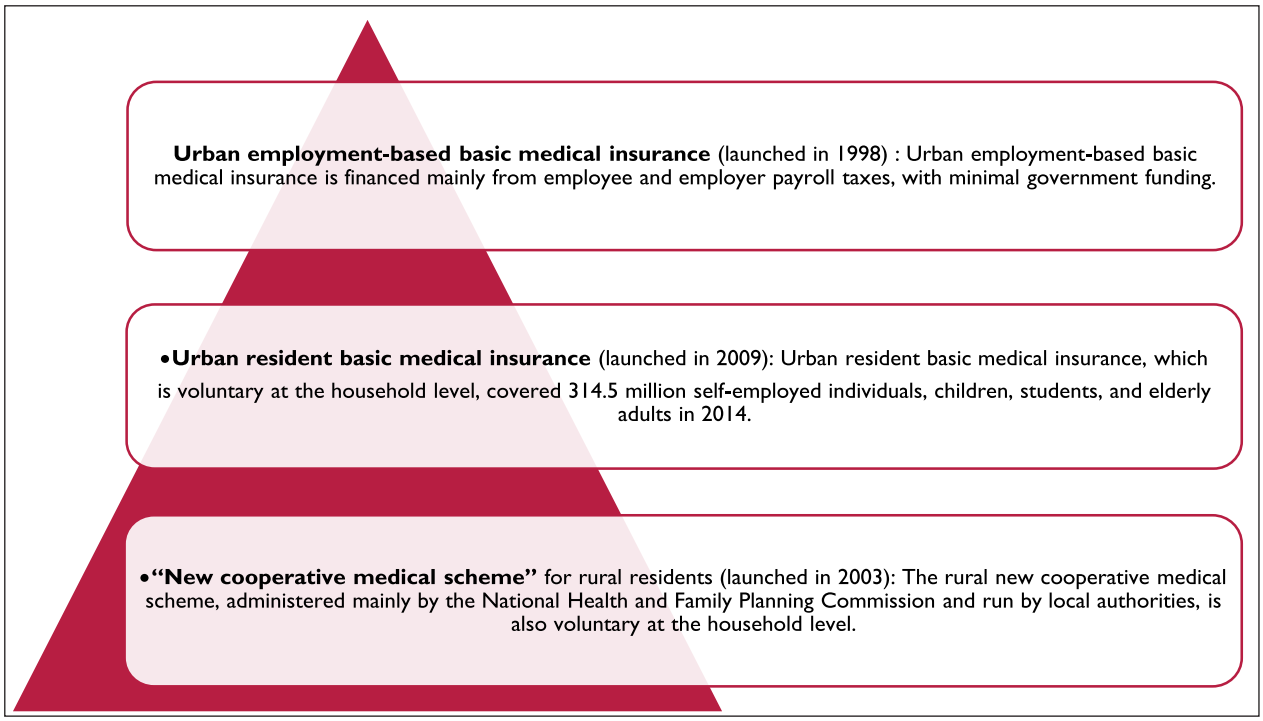


Healthcare System in China

Healthcare in China consists of both public and private medical institutions and insurance programs. **About 95% of the population has at least basic health insurance coverage.** Despite this, public health insurance generally only covers about half of medical costs, with the proportion lower for serious or chronic illnesses. Under the **"Healthy China 2020" initiative**, China is currently undertaking an effort to cut healthcare costs, and the government requires that insurance will cover 70% of costs by the end of 2018. The Chinese government is working on providing affordable basic healthcare to all residents by 2020.

The above applies to Mainland China. Special Administrative Regions of Hong Kong and Macau maintain their own separate universal healthcare systems. Generally, health insurance is publicly provided and financed by local governments. In 2016, China spent **approximately 4.98 percent of GDP.**

There were three main types of publicly financed insurance:



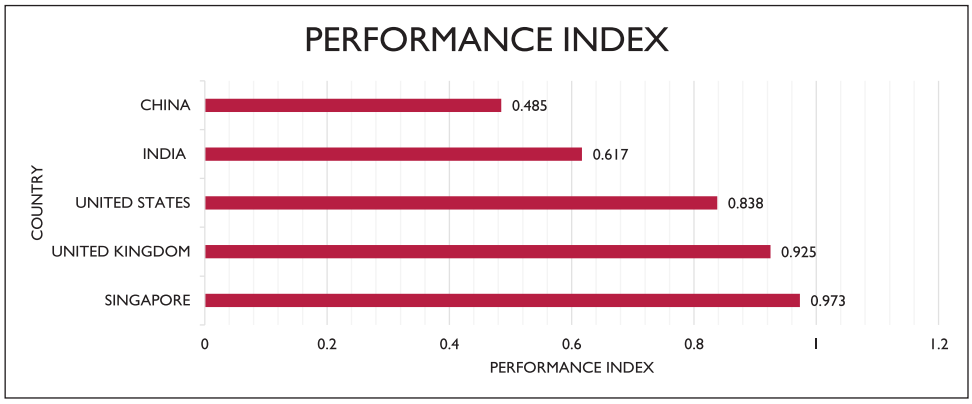
These systems cover 97% of the population. Actual coverage is minimal, with large disparity between plans and high out-of-pocket spending. There is a looming funding crunch as health care expenditures outgrow public funding.

China has one of the longest recorded history of medicine records of any existing civilization. The methods and theories of traditional Chinese medicine have developed for over two thousand years. Western medical theory and practice came to China in the nineteenth and twentieth centuries, notably through the efforts of missionaries and the Rockefeller Foundation, which together founded Peking Union Medical College.

Today Chinese traditional medicine continues alongside western medicine and traditional physicians, who also receive some western medical training, are sometimes primary care givers in the clinics and pharmacies of rural China. Various traditional preventative and self-healing techniques such as qigong, which combines gentle exercise and meditation, are widely practiced as an adjunct to professional health care.

Conclusion

According to the WHO report "MEASURING OVERALL HEALTH SYSTEM PERFORMANCE FOR 191 COUNTRIES", among the above-mentioned countries, **Singapore is the best performing country**. United Kingdom is behind Singapore. The United States, India and China make the bottom three in terms of performance in Health sector. China is the worst performing country among these.



A 2014 study by the private American foundation The Commonwealth Fund found that although the **U.S. health care system is the most expensive in the world**, it ranks last on most dimensions of performance when compared with Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland and the United Kingdom. The study found that the United States failed to achieve better outcomes than other countries, and is last or near last in terms of access, efficiency and equity.

There are 1.4 million doctors in India. Yet, India has failed to reach its **Millennium Development Goals** related to health. The healthcare system of India is lacking in three factors related to access to healthcare: **provision, utilization and attainment**. Provision, or the supply of healthcare facilities, can lead to utilization, and finally attainment of good health.

In China, primary care in has not developed as well as intended. The main barrier has been the scarcity of suitably-qualified health professionals.

Singapore's well-established health care system comprises a total of 13 private hospitals, 10 public (government) hospitals and several specialist clinics, each specializing in and catering to different patient needs, at varying costs. Patients are free to choose the providers within the government or private health care delivery system and can walk in for a consultation at any private clinic or any government polyclinic. **Singapore's medical facilities are among the finest in the world**, with well qualified doctors and dentists, many trained overseas.

In February 2016 the Organization for Economic Co-operation and Development published a review which concluded that performance of the NHS in Wales was little different from that in the rest of the UK. They described performance across the UK as "fairly mediocre" saying that great policies were not being translated into great practices.

Sources: www.google.com, www.wikipedia.org, www.commonwealthfund.org, www.who.int, www.oecd.org

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A state-wise analysis of infectious disease rates in India

Abstract:

Background - Infectious diseases have significantly impacted Human Morbidity and Mortality Rates, and have led to much economic adversity in India. They are a major deterrent to socio-economic growth and cause extreme financial distress, especially in low-income households. This paper sets out to mathematically analyse the dependence of case rates of common infectious diseases on several aspects of state infrastructure which may influence disease instances. The results of this analysis on these factors can be implemented for better disease control in our country.

Methods - This mathematical analysis was done using Multivariable Linear Regression on raw time series data to investigate the dependence of infectious diseases case rates on various aspects of state infrastructure. In addition, Karl Pearson's Correlation was carried out between the dependent variable and the independent variables (both as One-way Analysis and Two-way Analysis). This was followed by Cross-Correlation analysis between the independent variables to eliminate factors that would point to the same result.

Results - This study highlights the high dependence of Normalised Case Rate of Infectious Diseases on state-wise Expenditure on Healthcare, Birth Rate, Poverty Rate and Literacy Rate. In addition, it is nearly independent of the number of Rural Primary Healthcare Centres and the number of Government Hospitals in each state.

Keywords: malaria, infectious diseases, state infrastructure, diarrhoea, viral hepatitis

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1. Introduction:

Infectious diseases over the years have significantly impacted Human Morbidity and Mortality Rates, and have led to much economic adversity in India. The need to study these diseases can be highlighted by the fact that 52% of the 20 lakh confirmed malaria cases in South-East Asia were contributed by India, as per the World Malaria Report (WMR) 2013. India reported 1 lakh 57 thousand dengue cases and 250 deaths during the year 2017 according to the World Health Organisation. Infectious diseases are a significant deterrent to socio-economic growth. In addition, these diseases cause extreme financial distress, especially in low-income households, since they are expensive to treat and prevent patients from earning income. This has led to the launch of several government schemes like RSBY and the Pradhan Mantri Ayushman Bharat Yojna to alleviate the effects of these diseases by providing people with health insurance. Another method of preventing diseases from distressing people is to reduce the cost of treatment of these diseases. It is of utmost importance to take steps to prevent infectious diseases from spreading.

This paper sets out to mathematically analyse the dependence of case rates of common infectious diseases on several aspects of state infrastructure which may influence disease instances. This mathematical analysis was done using Correlation Analysis as well as Linear Regression analysis. Regression analysis is among the most commonly used methods of statistical analysis, especially in public health research. It is used to describe the dependence of a particular variable that is being studied on several explanatory variables. Correlation is a type of analysis in two variables that measures the relationship between two variables and the direction of the association between them.

The four most common infectious diseases in India, are Malaria, Acute Diarrhoea, Acute Respiratory Infection and Viral Hepatitis, have been discussed in this paper which sets out to determine the factors affecting the state-wise case rate of the above mentioned communicable diseases in India. This was done using traditional time-series regression on particular medical factors to evaluate the case rate and mortality of these infectious diseases. In addition, Karl Pearson's Correlation was carried out between the dependent variable and the independent variables (both as One-way Analysis and Two-way Analysis), followed by Cross-Correlation analysis between the independent variables to eliminate

factors that would point to the same result. Regression has been done on raw time series data to investigate the dependence of infectious diseases case rates on various aspects of state infrastructure. This mathematical analysis of the disease rates confirms the dependence of the case rate of these diseases on various factors. The results of this analysis on these factors can be implemented for better disease control in our country.

2. Tools used in this analysis:

The package R 2.9.0 has been used to carry out Multivariable Linear Regression Analysis as well as Cross-Correlation Analysis on the independent variables. For all other graphical and mathematical analysis and modelling, including Simple Linear Regression and bivariate Correlation Analysis, Microsoft Excel 2013 was used.

3. The list of factors used to determine the findings, along with their sources are as follows:

1. Diseases: Cases and Deaths - Directorate General of State Health Services
2. State Expenditure on healthcare - Budget documents of the state governments, CAG for 2015-16 in respect of Jammu & Kashmir
3. Literacy Rate - data.gov.in
4. State per capita GDP - Ministry of Statistics and Programme Implementation
5. Estimated birth rates, death rates and Infant Mortality Rate - data.gov.in
6. The Population of States - Office of the Registrar General of India, Ministry of Home Affairs
7. Number of Government Hospitals, Allopathic Doctors and Hospital Beds - Directorate General of State Health Services
8. Rural Health Infrastructure - Ministry of Health & Family Welfare
9. Literacy Rate - NITI Aayog, (National Institution for Transforming India)
10. Poverty Rate - Reserve Bank of India, Census Sept 16 2015

4. The results of Karl Pearson's Correlation carried out on these variables state-wise on excel are:

1. The Normalised Case Rate of Infectious Diseases has a strong correlation with Birth Rate and Infant mortality rate and a moderate negative correlation with Mortality Rate.
2. The Normalised Case Rate of Infectious Diseases has a powerful correlation with State Expenditure towards Healthcare.
3. The Normalised Case Rate of Infectious Diseases has a moderate negative correlation with State per capita GDP
4. The Normalised Case Rate of Infectious Diseases has a weak positive correlation with the number of Government Hospitals, Hospital Beds and Doctors
5. The number of Government Hospitals, Hospital Beds and Doctors has a strong positive correlation with State Expenditure towards Healthcare
6. The number of Government Hospitals, Hospital Beds and Doctors has a weak positive correlation with State per capita GDP.
7. Infant Mortality Rate has a moderate negative correlation with State Expenditure towards Healthcare
8. The number of rural PHC has a strong positive correlation with State Expenditure towards Healthcare
9. The Normalised Case Rate of Infectious Diseases has a moderate negative correlation with Literacy Rate.
10. The Normalised Case Rate of Infectious Diseases has a strong positive correlation with Poverty Rate
11. As the State per capita GDP increases, State Expenditure on Healthcare increases, and this causes a decrease in the Normalised Case Rate of Infectious Diseases.
12. As the State per capita GDP increases, the state-wise Number of Government Hospitals increases, and this causes a decrease in the Normalised Case Rate of Infectious Diseases.
13. As State per capita GDP increases, the number of Doctors per Government Hospitals increases and the Normalised Case Rate of Infectious Diseases decreases.
14. As the State Poverty Rate decreases, the number of Government Hospitals increases, and the Normalised Case Rate of Infectious Diseases decreases.
15. As the number of Doctors per Government Hospital increases, the number of Hospital Beds per Hospital in a state increases, and the Normalised Case Rate of Infectious Diseases decreases.

5. Then, using Cross-Correlation, eight independent variables were selected for Regression Analysis:

1. Govt Doctors per Hospital
2. State per capita GDP
3. Expenditure
4. Rural Primary Healthcare Centres
5. Number of Govt Hospitals
6. Birth Rate
7. Poverty Rate
8. Literacy Rate

	Doctors per Hospital	State per capita GDP	State Expenditure	Rural PHC	No of Hospitals	Literacy Rate	Poverty Rate	Birth Rate
Doctors per Hospital	1							
State per capita GDP	-0.04945	1						
State Expenditure	0.06778	0.65833	1					
Rural PHC	-0.16300	-0.17311	0.41031	1				
No of Hospitals	-0.44271	-0.16348	-0.42260	0.66282	1			
Literacy Rate	0.11925	0.21605	0.45821	-0.48114	-0.31396	1		
Poverty Rate	-0.38378	0.30114	-0.10633	-0.02614	0.14002	-0.34944	1	
Birth Rate	0.00376	-0.04431	-0.34072	0.45371	0.20234	-0.72270	0.42369	1

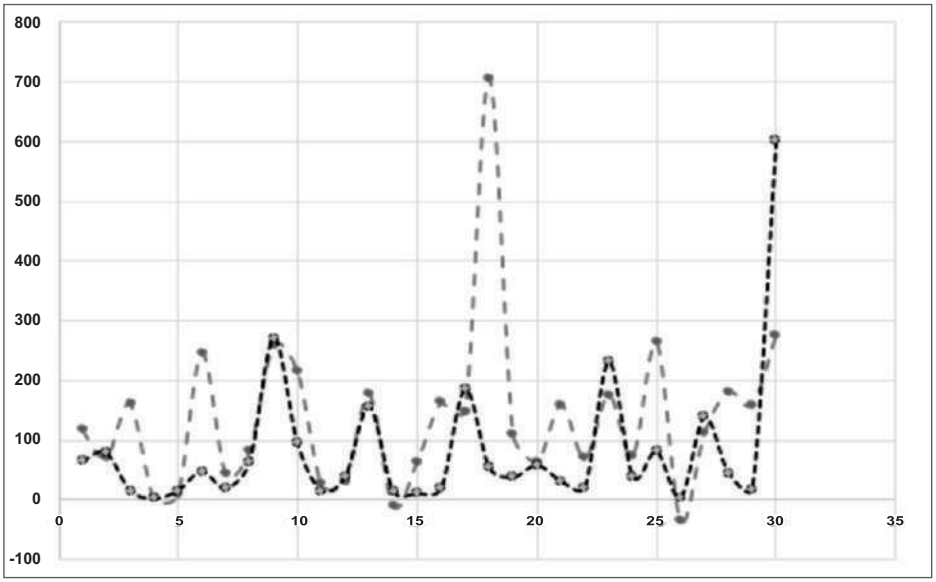
Table I This is the result of Cross-Correlation Analysis done on eight independent variables in 2011 which was done using R.

Then, Linear Multivariable Regression Analysis was carried out for the Normalised Disease Case Rate on these eight independent Variables in 2011. The results of this analysis are as follows:

	Intercept	Doctors per Hospital	State per capita GDP	State Expenditure	Rural PHC	No of Hospitals	Literacy Rate	Poverty Rate	Birth Rate
Coefficients	-557.72656	-0.14594	-0.31147	75.47501	-0.04428	0.05688	2.43767	-2.15777	8.40330

Table II This analysis represents the Normalised Case Rate of 4 Common Infectious Diseases and its dependence on eight independent variables and has an R2 value of 0.674.

This 2011 Linear Regression Analysis was then used to predict the Normalised Case Rate in 2008. The graph of the actual Normalised Case Rate as well as the Predicted Normalised Case Rate is as follows:



Here, black represents the Predicted Normalised Case Rate and gray represents the Actual Normalised Case Rate in 2008.

Malaria is the most common infectious disease in India. Thus, Linear Multivariable Regression Analysis of the Normalised Case Rate of Malaria was carried out on these eight independent Variables

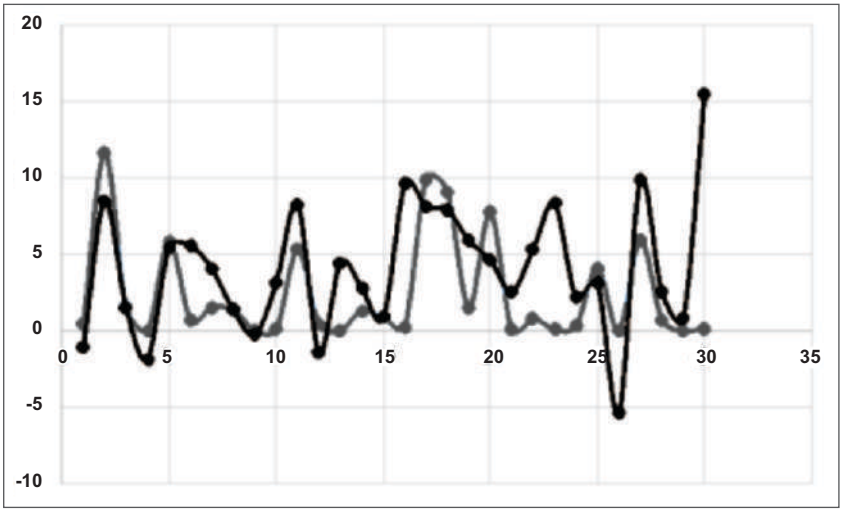
in 2011. The results of this analysis are as follows:

	Intercept	Doctors per Hospital	State per capita GDP	State Expenditure	Rural PHC	No of Hospitals	Literacy Rate	Poverty Rate	Birth Rate
Coefficients	-1.77129	0.058671	-0.00267	0.034759	-0.00308	0.003971	-0.03255	0.069966	0.272654

Table III This analysis represents the Normalised Case Rate of Malaria and its dependence on eight independent variables and has an R^2 value of 0.626.

I then used this 2011 Linear Regression Analysis to predict the Normalised Case Rate of Malaria in 2008.

6. The graph of the actual Normalised Case Rate of Malaria as well as the Predicted Normalised Case Rate of Malaria is as follows:



The accurate predictions of the Normalised Case Rate of Infectious Diseases as well as of the Normalised Case Rate of Malaria of 2008 using the Regression Model for 2011 verifies the Regression Model developed in this study. This study highlights the high dependence of Normalised Case Rate of Infectious Diseases on the State Expenditure on Healthcare, Birth Rate, Poverty Rate and Literacy Rate.

7. Outcomes:

Some outcomes of this analysis, verified by Mr. Chandrakanth Mishra, Director Institutional business, Religare Health Insurance, are as follows:

The Normalised Case Rate of Infectious Diseases is dependent on State Expenditure towards Healthcare by a significant amount. It is also strongly related to the Birth Rate, Literacy Rate and Poverty Rate of a state. However, it is almost independent of the number of Rural Primary Healthcare Centres and the number of Government Hospitals in a state.

This is because the Normalised Case Rate of Infectious diseases is dependent mainly on the condition of living of the population, which entails hygiene and sanitary factors. The access to healthcare of the people in the state is a secondary factor. This is validated by the fact that urban towns, where people have better access to healthcare, have a higher incidence of infectious diseases which are caused due to the poor pollution and living conditions of people in cities.

There is a lack of preventive measures and schemes for infectious diseases in India. There is a want for vaccination programs, especially when there are outbreaks of diseases in states. The Expanded Programme on Immunisation for the Polio vaccine, which is the most successful vaccination program in India, was a private initiative which was then supported by the government. The findings of this analysis reveal that even in underdeveloped states in India, money invested in preventive measures like vaccines helps prevent the spread of infectious diseases more than money invested in the construction of hospitals and healthcare centres.

The quality of life of the people in a developed state is measured using two crucial metrics: Literacy rate and Poverty Rate. The Literacy Rate is higher in most high-income states. People are more aware of ways to combat infectious diseases. Thus, the Normalised Case Rate is lower in states with high Literacy Rate. However, some states with a high Literacy Rate may still have a high Normalized Case Rate of Infectious Diseases. This is the case in states like Kerala,

where there is insufficient access to healthcare.

Even in developed states in India, there is insufficient spending on healthcare infrastructure, awareness building and health education. In first-world countries, spending on healthcare is around 5%, in India it is 2%. Thus, education and healthcare in India do not get the funding required. Some states having a high state GDP still have a high Normalised Case Rate of Infectious Diseases. For example, Gujarat has a very high case rate of gastrointestinal infections and swine flu. This is due to their low nutritional index, especially in infants.

In India, even in developed states, the state medical infrastructure is still inadequate. The number of hospitals and doctors per thousand is still far less than the number in foreign countries. Once the infrastructure is adequate for the population size to have proper access to healthcare and medical facilities, the Normalised Case Rate of Infectious Diseases should fall dramatically.

8. References

The list of factors used to determine the findings, along with their sources are as follows:

1. Diseases: Cases and Deaths - Directorate General of State Health Services
2. State Expenditure on Healthcare - Budget documents of the state governments, CAG for 2015-16 in respect of Jammu & Kashmir
3. Literacy Rate - data.gov.in
4. State per capita GDP - Ministry of Statistics and Programme Implementation
5. Estimated birth rates, death rates and Infant Mortality Rate - data.gov.in
6. The Population of States - Office of the Registrar General of India, Ministry of Home Affairs
7. Number of Government Hospitals, Allopathic Doctors and Hospital Beds - Directorate General of State Health Services
8. Rural Health Infrastructure - Ministry of Health & Family Welfare
9. Literacy Rate - NITI Aayog, (National Institution for Transforming India)
10. Poverty Rate - Reserve Bank of India, Census Sept 16 2015

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Life Insurance Insights

Top 10 – news, views and trends

"Weighted new business premium collection by the private life insurers grew by 24.7% during first four months of FY2019-20. HDFC Life, Tata AIA Life and Future Generali Life record more than 50% growth in new business premium collections over the reporting period, year-on-year. SBI Life continued to remain the market leader amongst private insurers with a growth of 31.5% in terms of weighted new business premiums.

The industry remains abuzz with transaction and distribution activities. BNP Paribas Cardif has offloaded another 2.5% stake in SBI Life and Standard Life has reduced about 5% stake in HDFC Life. The Government of India is reportedly "exploring legal opinions" to disinvest and list India's largest financial institution, Life Insurance Corporation of India. The industry also saw increased number of tie-ups between insurers and digital financial service providers strengthening their digital presence.

On the regulatory front, IRDAI has finalized guidelines in respect of regulatory sandbox and has gazetted Linked and Non-Linked Insurance Products Regulations. The IRDAI has also proposed norms around minimum information to be maintained by insurers and relaxations in 'Use and File' procedures for modifications under existing products. Following is a summary of the top ten key trends and developments that shaped the life insurance market in India during the period of May to August 2019."

10 FDI limit for insurance intermediaries increased to 100%

The Foreign Direct Investment (FDI) limit for insurance intermediaries has been increased to 100%, up from the current level of 49%. Media reports suggest that norms have been relaxed to promote investment in digital solutions, boost distribution and improve insurance penetration. Government has also proposed to reduce Net Owned Fund requirements from INR50 billion to INR10 billion to attract international reinsurers. Reportedly, the Government is also reviewing FDI limit for insurance companies, which was last revised in 2015 to 49%.

9 IRDAI has relaxed norms in 'Use and File' procedure for modifications under existing products

The IRDAI has proposed changes in 'Use and File' procedure with an aim to ease the process of filing modifications to previously approved products. Insurers will no longer be required to follow the complete "File and Use" procedure for minor modifications such as changes to premium rates within permissible range, addition of new distribution channels, changes in reinsurance arrangements etc.

The above modifications can only be made if general and specific norms as proposed by IRDAI are satisfied. Key generic norms include:

- No detrimental changes in premium rates, charges, benefit structures or any other provisions affecting existing policy contracts.
- The changes should be based on reasonable assumptions and generally accepted actuarial principles. For example, premium rates, charges and benefits should vary by age and there should be internal consistency between the economic assumptions.
- The premium rates or charges between policies sold through different distribution channels should be equitable.

In addition to the generic norms, certain specific norms have also been outlined that all insurers are required to satisfy.

8 IRDAI proposes guidelines specifying minimum information required to be maintained by insurers

The Insurance Regulatory and Development Authority of India (IRDAI) has proposed guidelines around minimum information to be maintained and the necessary checks to be adopted by the insurers/intermediaries for each class or sub-class of the insurance business. The IRDAI had previously issued a draft regulation and invited comments, based on which the "Minimum Information

required for Inspection or Investigation Regulations, 2019" have been proposed. The key guidelines are summarized below:

- Insurers and intermediaries should maintain a record of all proposals, policies and endorsements received.
- A record of premiums received including any excess or deficits, with all deposits and top up premiums being retained. In case of deficit in premiums, further details regarding the amount of deficit should be maintained.
- All working papers, signed reinsurance treaties, coinsurance agreements and claims related documents should be maintained.
- Additional information on Net Asset Value, units redeemed, charges levied, amount of partial withdrawals etc. should be maintained for Unit Linked business.

7 Digitalization of the Distribution Landscape

Insurance industry has witnessed further developments in bancassurance arrangements with Bajaj Allianz Life partnering with Syndicate Bank, SBI Life and Aditya Birla Sun Life partnering with Indian Bank for distribution of their products.

The reporting period has also witnessed several tie ups between insurers and digital financial service providers. Key updates include:

- Aegon Life has partnered with eBaoTech, a digital solution provider, to develop its cloud based platform named - 'Headless Manufacturer'. This platform is reportedly aimed at enhancing customer experience by providing infrastructure for high-volume and velocity eCommerce channels.
- Bharti AXA Life has tied up with Airtel Payments Bank to sell its Point of Sale product, 'Saral Jeevan Bima Yojana' through the latter's banking points across the country.
- HDFC Life has tied up with Bharti Airtel to offer a complementary term insurance cover with a prepaid recharge of INR249 where the coverage is limited until plan's validity.
- Edelweiss Tokio Life has partnered with MobiKwik to offer its products through MobiKwik's wallet app and website.
- Kotak Life has partnered with InsurTech firm, Turtlemint to strengthen its distribution footprint through firm's MintPro app and pan India Point of Sales Persons (POSPs) distribution network.

6 BNP Paribas Cardif and KKR offloaded stakes in SBI Life, Government eyes listing of LIC

- BNP Paribas Cardif has divested another 2.5% of its stake in SBI Life through an offer-for-sale taking its stake down to 5.2%. The offer comprised of about 25 million shares at a floor price of INR650. This marked the third instance in the calendar year where BNP Paribas Cardif has offloaded its stake in the joint venture, totalling a stake sale of 16.8% over the year. The American private equity firm KKR, through its affiliate, has also diluted one-third of its 1.95% stake in the insurer through a block deal on stock exchange. Reports suggest that KKR sold 6.5 million shares worth INR5.0 billion.
- Standard Life has reduced its stake in HDFC Life from 24.8% to 19.8% through a couple of transactions. The foreign insurer first offloaded 1.8% of its stake for INR14 billion via offer-for-sale, followed by sale of another INR32 billion (approximately 3.3%). The public shareholding in HDFC Life has now increased above 25% threshold as prescribed in SEBI regulations.

Potential transactions in future:

- Reportedly, British insurer Aviva is planning to sell its stake in Aviva Life, as part of its broader plan to divest stakes across Asia. Aviva Life is a joint venture between Dabur and Aviva with holding of 51% and 49% respectively.
- As per media reports, the government is considering listing of state-owned insurer, Life Insurance Corporation of India (LIC). The insurer holds about two-third share of India's Life Insurance market with Assets Under Management (AUM) of over INR31 trillion. The move could make the insurer the largest listed company in India by market valuation. Reportedly, the listing would first require an amendment to the LIC Act.

5 Positive profits reported by 11 private life insurers for Q1 FY2019-20

As per financial results disclosed by 22 private life insurers, 11 have reported profit at the end of the first quarter of FY2019-20, compared to 13 out of 22 insurers making such disclosure in corresponding

period in the previous fiscal. Amongst the 11 insurers who have reported a profit, 8 have recorded a positive year-on-year growth compared to the profit figures reported for Q1 FY2018-19. The total profit after tax for private life insurers making such disclosure has decreased by 13.3% from INR10.8 billion in Q1 FY2018-19 to INR9.3 billion in Q1 FY2019-20.

4 Life insurers focusing on cost effective Digital Transformation Initiatives

- Max Life has launched its startup incubator program - Max Life Innovation Labs. As a part of this initiative, Max Life will tie up with startups to create futuristic solutions for seller hiring, intelligent data acquisition and financial management. Reportedly, Max life will also apply this program to Regulatory Sandbox launched by IRDAI.

- DHFL Pramerica Life has partnered with MongoDB ATLAS to automate operational tasks and optimize performance of their database with reliability and speed. Reportedly, the insurer has also selected Amazon Web Services (AWS) as it's cloud provider and will move majority of its applications and data to AWS. These initiatives are expected to reduce its operating expenses by atleast 15% in the next 12 months.

- Aditya Birla Sun Life has also embraced cloud technology by using virtual desktops on Microsoft Azure to reduce expenditure and enable employees to access data and applications seamlessly across branches.

3 IRDAI has finalized regulatory sandbox and insurance products regulations

- The IRDAI has now gazetted Linked and Non-Linked Insurance Products Regulations. For linked products, revival period has now been reduced from two to three years while for the maximum settlement period has been reduced from 10 to five years, as compared to the Exposure draft. The category of non-linked variable products has also been removed from the gazetted regulation.

- The IRDAI has also finalized regulations and operational guidelines pertaining to the regulatory sandbox. The proposal would initially be tested on a sample cohort of customers not exceeding 10,000 and with total premium collections not amounting to more than INR5 million. Further, expenses incurred on the sandbox proposal should be maintained separately and presented as a line item in the applicant's Annual Report. For insurers, such expenses should be charged to the shareholders' accounts or its equivalent.

2 Key appointments at Aditya Birla Sun Life, Canara HSBC OBC Life and IRDAI

Mr. Kamlesh Rao has taken charge as the new Chief Executive Officer (CEO) and Managing Director (MD) of Aditya Birla Sun Life. Mr. R A Sankara Narayanan has been appointed as the Chairman and additional Director of Canara HSBC OBC Life. Mr. Ganesh K, has been appointed as the Member (Life) at Insurance Regulatory and Development Authority of India (IRDAI). Previously, he was serving as Executive Director for Corporate Communications at Life Insurance Corporation of India (LIC).

1 Private insurers maintain strong growth in new business premium collections over the first four months of FY2019-20

As per data released by IRDAI, weighted new business collections (calculated as 100% of regular premium and 10% of single premium) for Private insurers has amounted to INR132.1 million during April to July 2019. This represents 24.7% growth, up from INR106.0 million over the same period during FY2018-19. SBI Life consolidated its position as the largest private insurer with new business premium collections amounting to INR26.8 million, closely followed by ICICI Prudential Life collecting INR23.1 million during April to July 2019. HDFC Life, Tata AIA Life and Future Generali Life also recorded impressive growth rates of over 50% during the first four months of FY2019-2020.

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LICAT

In 2018 we successfully transitioned to a new regulatory capital framework, the Life Insurance Capital Adequacy Test (LICAT). LICAT was a major overhaul to solvency monitoring to a more risk based approach and required significant process changes to perform the calculation. Lessons learned from this implementation was training ground for the next big overhaul, IFRS 17, which will require even more substantive changes.

Canada Pension Plan

The Canada Pension Plan provides a basic income to retired Canadians. Employees and employers contribute annually and the benefits payable are based on a person's salary and number of working years. Benefits are currently paid at age 65, with reduced benefits starting at age 60 and increased benefits up to age 70. Given increased longevity and the core of the baby boom generation reaching retirement, in April 2019, the Canadian Institute of Actuaries released a public statement recommending that these ages be deferred to 67, 62 and 75, respectively, to help preserve the financial sustainability of this program. Details of the public statement can be found at cia-ica.ca/retirement.

Climate Change

Actuarial organizations in Canada and the United States track an Actuaries Climate Index where the index is based on a measure of extreme climate events and changes in sea level. Increasing values in the index imply increasing occurrences of extreme events. The index was updated with new data from the winter of 2018-19 and the index increased from 1.02 to 1.10, the largest quarter-to-quarter change over the study period. Additional details can be found at http://actuariesclimateindex.org.

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