MAHENG/2013/50733

भारतीय बीमा संस्थान
INSURANCE INSTITUTE OF INDIA

THE JOURNAL OF INSURANCE INSTITUTE OF INDIA

For Free Distribution
ISSN No. 2278-6759

VOLUME NO. XIII ■ ISSUE NO. II MUMBAI OCTOBER-DECEMBER - 2025

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The Journal of Insurance Institute of India is registered in University Grants Commission - UGC CARE List.

The Journal of Insurance Institute of India

Since 1974
Volume

OCTOBER - DECEMBER 2025

Printed and Published by
SNEHA VIKAS PEDNEKAR on behalf of INSURANCE INSTITUTE OF INDIA,
Printed at
ACME Packs & Prints (I) Pvt. Ltd.,
Gala No. 16, Gr. Floor, Samkit Building,
Sagar Signature Industrial Estate,
Waliv Phata, Waliv, Vasai (East),
District Palghar - 401 208.
and Published from
INSURANCE INSTITUTE OF INDIA,
Plot No. C-46, G Block,
Bandra-Kurla Complex, Bandra (East),
Mumbai 400 051.
Editor: **P. Jaipuria**

Editorial Support, Design and Printing by
ACME Packs & Prints (India) Pvt. Ltd.

EDITORIAL

This issue does not have a specified theme for the articles. The structure of the journal is such that some editions have a specific theme on which articles are invited. Some editions are open for all subjects, of course related to insurance.

Editions which have a specific theme, no doubt bring about wealth of in depth information on that specific topic. It would be a treasure to be preserved by any researcher keen on exploring specified areas.

Non theme editions, like this one, again, open up new areas regarding insurance, to the readers.

In this issue, you can see the wide canvas. From agriculture, health etc to financial inclusion, risk pooling, and insurance for all by 2047 and so on are there. The authors have taken effort to analyses their respective subjects and come up with well-presented articles.

This issue is recommended to all our dear readers.

Editorial Team

Innovative Model of Insurance for Gig Workers: A Thematic Study from Exclusion to Inclusion

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Abstract

Study substantial has been received from different online and offline search engines. This study is about the innovative model of insurance for gig workers who are prone to risk at every step of their profession. Objective of study is to include the excluded gig workers in the cover of insurance at affordable cost of premium. Thematic analysis has been incorporated for qualitative outcome based on the data that has been extracted with extensive scanning of published research papers and websites etc. Results of study clarify that formulation of specific gig policy including all relevant parameters at the end of government is required, so that affordable insurance cover for gig workers will be common at every point of sale. Themes generated from the literature repository acclaim that gig workers share is increasing hypothetically in different business sectors currently, thus the affordable insurance is imperative for their financial protection.

Keywords

Affordable Insurance, Gig Workers, Innovative Model, Specific Policy.

Introduction

Gigism and its Relevance

Gigism is potentially increasing everywhere. Mostly young people are associated with this phenomenon who are inclined to specialized skills and innovation of businesses. People allied with gigism prefer freelance and are eager to have handsome income and higher earnings within limited duration. Accordingly, gig worker is a person who does temporary or freelance work, especially an independent contractor, online platform worker, contract firm worker etc. engaged on an informal or on-demand basis. Gig workers are mostly working on part-time basis as a way to earn supplementary income. Gig workers enter into formal agreements with on-demand companies to provide services to the company's clients.

Forecasts for the Gig & Platform Sector in India

NITI Aayog report utters it is projected that 7.7 million workforces were involved in the gig economy during 2020- 21. Gig workers are expected to expand 2.35 crore by 2029-30. Presently 47% gig workers are medium skilled, 22% are high skilled, and 31% are low skilled ones (NITI Aayog, 2022).

Exclusion to Inclusion

Exclusion to Inclusion refers to a shift from systems and policies that leave certain groups unprotected (exclusion) to those that actively integrate and protect them (inclusion). In the context exclusion and inclusion highlights for gigsm are:

Exclusion (Current Problems):

- Gig workers (Zomato, Uber, Ola etc.) are often denied employer-based life insurance.
- Legal classifications: - Gig workers are excluded from labour laws.

Inclusion (Solutions & Reforms):

- Government-mandated protections (e.g., California's Prop 22 adjustments, EU's platform work directives).
- Tech-driven solutions (Insurance, on-demand coverage via apps).
- Legal reclassification (some countries now legalize gig workers as employees).

Speciality of Gig economy

There is no direct employment in the gig civics. Workers are paid for flexi hours and are not on pay roles. This flexibility is equally beneficial to the workers and for the companies associated with this community. Gig economy is powerful and can control the behaviour of the associates. It is important that growth of gig economy is having uncertainty without insurance cover to them. Similarly, affordable insurance cover is apt approach for the growth (Najar, 2022) of gig economy. Insurance cover provides the financial security to gig workers. Scope of study clarified that innovative model of insurance for gig workers is required so that gig ecosystem and it's all parameters will be rescued from the financial crunch.

Literature Review

Gig Workers and their importance

Gig workers play a significant role in the modern economy by offering various benefits and opportunities to the people of society. Modern economy is transformed and digitalized after 2000. As a result, on-demand platforms based on digital technology have created jobs that are differentiated from existing offline transactions by the level of accessibility, convenience and price competitiveness. Normally "work" describes a full-time job with set working hours, including benefits. But with advent of technology, work concept began to change with changing economic conditions. This change in the economy created a new labour workforce characterized as independent labour also known as Gig workers. Gig workers offered flexibility, opportunity for autonomy, diversity and progressive higher earnings. This global change has created high importance to gigism.

Advantages and disadvantages in Gig Civics

Gig workers have high levels of task variety and complexity. These jobs generally confer few employer-provided benefits and workplace protections. According to a 2021 report by the WHO and the ILO the expansion of gig economy can be seen as one significant factor for increase in worker deaths who work over 55 hours a week, rising from 600,000 deaths in 2000 to 750,000 in 2016. The 2016 report found that 9% of world's population worked greater than 55 hours weekly and this was more prevalent among men, as well as workers in the Western Pacific and South-East Asia regions.

Availability of Insurance models for Gig Workers

In China, gig workers are covered by insurance, "*work-related injury insurance,"* with platforms like Meituan and JD.com offering social security benefits. This is in response to a growing awareness of the need to protect gig workers who lack traditional employment protections.

Work-related Injury Insurance for Gigism in China

This insurance cover is mandatory in China for Gig workers through different platforms as Online platforms are now required to provide workers with same level of work-related injury compensation insurance as regular employees. This includes medical expenses, disability compensation, and death benefits for the worker's family in the event of a workplace accident.

Regulatory Efforts and their importance for Gigism in China

China has issued guidelines to protect gig workers in new employment forms, including social security and labour protection. These regulations require platforms to meet minimum wage standards and ensure access to social security for their workers.

Regulatory framework In India for Gigism

India has clearly laid out that gig economy and social protection are priority areas for the Employment Work Group. The Code on Social Security, enacted in 2020, has further consolidated the labour laws relating to social security for all sectors.

NITI Aayog's Gig Economy Report 2022 utters that the gig workforce is expected to expand to 23.5 million workers by 2029-30. Gig workers are expected to form 6.7 per cent of the non-agricultural workforce or 4.1 per cent of the total livelihood in India by 2029-30 (NITI Aayog, 2022). Given the urgency for the development of social security frameworks, the ILO Decent Work Team for South Asia and Country Office for India is undertaking the project *"Extension of*

social protection to gig and platform workers in India", supported by Japan Ministry of Health, Labour and Welfare.

The proposed project contributes to promote decent work and policy measures by framing new social security schemes for location-based platform workers. The project will work to support the Indian Government's vision for identifying the challenges and creating better opportunities for gig workers.

- **Indian Government Initiatives:**
- **PM Suraksha Bima Yojana**– Accidental death/disability insurance (₹2 lakh coverage at ₹12/year).
- **PM Jeevan Jyoti Bima Yojana** – Life insurance (₹2 lakh at ₹436/year).
- **Private Sector Efforts in India:**
- Platform-Provided Insurance (Uber's accidental cover, Zomato's health benefits for delivery partners).
- Insurtech Startups (Onsurity, Digit, Acko) offering group policies.

Gig Ecosystem and its framework for Gigism

Gig ecosystem is comprised of "Entities" that include gig workers, requesters and intermediary platform firm (Breidbach and Brodie, 2017). This implies that ecosystem is comprised of three entities because they interact through supplying labour (i.e. gig workers), demanding labour (i.e. requesters), or matching labour supply and demand (i.e. intermediary platform firm) while remaining semi-autonomous entities. The exchanges among gig workers, requesters and intermediary platform firms are characterized by interdependence. Therefore, an ecosystem refers to a group of interacting, yet semi-autonomous entities that depend on each other's activities and therefore are somewhat hierarchically controlled.

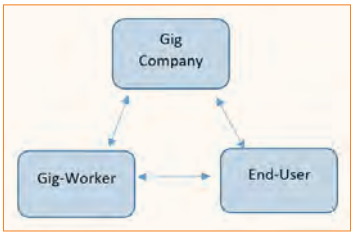

Fig. 1 Gig workers and their relationship (Ecosystem)

Uber: An Example of Ecosystem Perspective

When Uber drivers withdraw from the Uber ecosystem, there is limited value created for passengers as they cannot be transported. The contrary also holds: when passengers stop hailing taxi rides via the Uber platform, Uber drivers will not reap any benefits as there are no earnings to be made. Ultimately, the value to intermediary platform firms also depends on the ongoing contribution of gig workers and requesters/passengers. Therefore, ecosystem actors/intermediaries are said to be interdependent on each other in delivery and receiving services (Wareham et al 2014).

Different Intermediaries and its actors along with their platform are functional across the globe for the growth of economy by providing different types of services to the people. Few examples are as: -

Table 1. Intermediaries and their platform

Platform	Intermediator Company	Example	Gig Workers
Marriage Coordination platform	Bharat Matrimony	Head hunters	Middleman
Information sharing platform	Linked In	Social Media	Online Managers
Platform Cooperative Firms	Online Labour firms	Platform cooperatives	Cooperative Workers
Transport facilitators	Uber	Private transport	Professional Uber Drivers

Strategic Innovative insurance model for Gigism

Strategic innovation in Gig insurance is designed to address financial problems of gig workers and their companies in case of their untoward happenings. Below Venn diagram asserts that all the engaged stakeholders of gigism are interconnected for their individual growth and ecosystem growth. Secondly, they interact through supplying labour (***gig workers***), demanding labour (***requesters***), matching labour supply and demand (***intermediary platform firm***). This interconnectivism will be strong in presence of competitive insurance coverage at affordable cost.

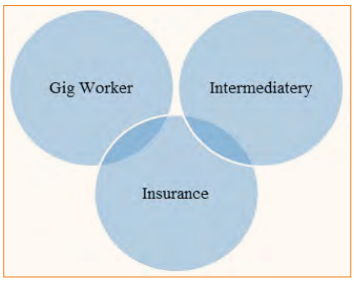

Fig 2 Conceptual model of study

Therefore, innovative insurance model for Gigism is required for quality outcome from the entities engaged with gigism. All the engaged entities will be benefited from it in different ways as financial stability, free from mental agony, out of pocket expenses reduction, risk mitigation etc. will be ensured. Furthermore, thoughts and ideas of engaged stakeholders should be integrated for quality inference (Najar, 2024).

Benefits of Insuring Gig Workers for Companies

Insuring gig workers can provide several benefits to companies in terms of risk management and competitiveness. Here are some key advantages:

1. **Attracting and Retaining Workers**
   - Offering insurance makes gig company more striking in attracting and retaining Workers.
   - Insured workers may stay longer with the company rather than elsewhere.
2. **Improved Worker Productivity and Loyalty**
   - Insured workers are likely to be loyal and more productive for companies.
   - Insured workers feel valued and deliver better customer satisfaction.
   - Insurance creates reliability in workforce that leads to better service consistency.
3. **Reduced Legal and Financial Risks**
   - Providing accident insurance can protect the company from liability claims in case gig worker gets hurt while performing tasks.
   - Workers' compensation-like coverage can prevent costly lawsuits.

Benefits of Gig workers with Insurance cover

Providing insurance coverage to gig workers offers significant advantages for the workers themselves, improving their financial security, health, and overall job satisfaction. Key benefits are: -

1. **Financial Protection**
   - **Medical Coverage:** Access to health insurance provides income protection and reducing out-of-pocket expenses.
   - **Life Insurance:** Offers security for dependents in case of unexpected death.
2. **Job Stability & Income Security**
   - **Short-Term Disability Insurance** replaces lost income/job during recovery from illness/injury.
   - **Workers' Compensation-like benefits** ensure support for workplace injuries.
3. **Legal & Liability Protection**
   - **Liability Insurance** protects workers from lawsuits (car accidents).
4. **Retirement & Long-Term Security**
   - Some platforms offer **retirement plans** helping gig workers to save their future. **For example, Uber / Lyft, Task Rabbit / Upwork, Delivery Apps) etc.**

Gap of Research

Gap of research means what has been literally ignored and not identified by the scholars of study. It contains the novelty and creates the scope for future research (Mueller, et al., 2015). Many changes for gig workers have been incorporated by the associated government bodies but insurance protection for gig workers has been literally ignored means there is **knowledge gap/ knowledge void gap** as desired findings are not existing in the existing literature (Miles, 2014).

Moreover, there existed **population gap** (Miles, 2014) wherein perception of gig workers regarding insurance cover is not studied in-depth and has been inadequately represented or is under-researched in the evidence base or prior research.

Similarly, few researches are available for qualitative approach, means, there existed the **methodological gap** which contests that **method and research design gap**.

Current study is associated with the fulfillment of **knowledge void gap** by providing the awareness that there

is need of insurance cover for gig workers in India that will provide them financial security.

Policy & Regulatory Gaps

- Mandatory Social Security for Gig Workers (despite 2020 Labour Codes).
- Lack of Standardization – Insurance products are often.

Therefore, the existing knowledge gap will be bridged by conducting the research under the title ***" Innovative Model of Insurance for Gig Workers": A Thematic study from Exclusion to Inclusion.*** Moreover, there is scope for analyzing the population and methodological gap by conducting further research.

Objective of Study

- to include the excluded gig workers in the cover of insurance at affordable cost of premium

Research questions associated with Gigism

- How Gig insurance will be incorporated in Gigism?
- Is Gig insurance policy a need for Gig community in India?
- What is the perception of engaged stakeholders towards Gig insurance?

Research Methodology

Thematic analysis

Thematic analysis is a method for examining and analyzing the textual material to handle "not only manifest content, but also themes present in texts as primary content" (Drisko & Maschi, 2016). In current study, themes are generated manually from the extracted data (Prasad, 2008). Hierarchical and Internal relationship of themes are addressed separately. Keyword analysis is conducted here and that offered numerous advantages as it laid foundation for meaningful data interpretation. Variables, concepts, themes etc. from existing literature have been analyzed and it inferred that innovative strategy of Gig insurance is having positive influence on the financial security of gig community in India.

Table 2. Thematic analysis and its structure

S/No	Sub-Category/ Keywords/Statements	Category	Themes
1	• Gig Insurance business through insurance brokers and companies • Influence on Gig Insurance Premiums in India • Innovation and growth in Gig Insurance and its market	Development of National policies for Gig insurance business and its market extension in present scenario.	**Strategic revolution of Gig insurance for Gig community in Indi**a
2	• Gig insurance Growth and innovation • Regulatory Framework for Gig insurance • Advancement of technology in Gig Insurance • Quality service and its affordability	Gig Insurance in India with future projections and challenges in digitalized era.	**Advancement and recognition of Gig Insurance as a financial tool in digitalized e**ra
3	• Engaged stakeholders' perception for systematic mapping towards Gig insurance in India • Engaged stakeholders' perception for innovative evaluation of gig strategies in India • Symbiotic benefits for gig workers, their intermediaries and insurance company	Innovative association and correlation between Gig insurance and Gig community in India.	**Synergic bonding between two industries is an innovation: Engaged stakeholders**
	Author's Compilation (Source)		

Results of study is summarized into 3 themes that are grounded on repetitive 60 keywords or 9 sub-categories. After frequency analysis, 3 categories emerged out of 60 keywords or 9 sub-categories as a quality outcome. Finally, 3 categories are utilized for effective themes of study. There are 3 themes that categorize the need of strategic innovation

in Gig insurance for Gigism as a financial tool. This model will cover their financial risk in case of untoward happening.

Theme 1: - Strategic revolution of Gig insurance for Gig community in India

A strategic revolution in gig insurance can transform financial security for Indian gig workforce. By leveraging technology, *'flexible models and partnerships', 'insurers and gig intermediaries'* can create a sustainable ecosystem for financial protection.

Indian gig economy is flourishing with millions of freelancers, delivery personnel, ride-hailing drivers etc. However, this segment remains largely underserved in terms of financial security particularly insurance. A strategic revolution in gig insurance can empower gig workers with affordable coverage, ensuring financial stability and risk mitigation.

Theme 2: - Advancement and recognition of Gig Insurance as a financial tool in digitalized era

Gig insurance must change from a reactive security net to a proactive financial tool for enabling credit, savings, and income stability. By leveraging regulatory support of technology, India can create a gig-worker-centric financial ecosystem where insurance is not just protection but a pathway to economic growth.

Gig insurance is evolving beyond basic risk coverage into a critical financial tool for Indian gig workforce. With over 15 million gig workers (expected to grow to 50 million plus by 2030), insurance must be recognized not just as protection but as a wealth-building and stability mechanism. Traditional insurance is passive, but gig insurance can be *proactive, flexible, and wealth-enhancing* by stabilizing income and long-term savings.

Them 3: - Synergic bonding between two industries is an innovation: Engaged stakeholders

The gig economy thrives on flexibility, but its workers face financial vulnerability. Gig insurance in collaboration with intermediaries can evolve from a transactional product into a synergistic ecosystem where by insurers, platforms (intermediaries), workers, and regulators co-create value. This participatory model ensures trust, relevance and long-term sustainability. There will be symbiotic benefit to all the concerned stakeholders.

Data Analysis and Interpretation

As gig economy continues to grow and create more opportunities for employment across the world, concerns over the protection of workers may likely increase. As our analysis indicates, many of these concerns can be addressed by recognizing and tapping into the synergies of public and private insurance instruments, careful modifications to the design parameters of social insurance programs to make both contributions and benefits more suitable to needs of gig workers. **Theme 1** analyses it is better to have strategic innovation for gig insurance because it can empower gig community in terms of quality service and can protect their futuristic glimpse. **Theme 2** asserts that financial stability will be ensured in presence of gig insurance. This implies that 15 million gig workers (expected to grow to 50 million plus by 2030) will not only be protected but they will be able to build wealth and regulate stability mechanism. Similarly, theme 3 emphasis for synergic approach between insurance industry and gig ecosystem because the future of gig insurance lies in synergy not just sales. When stakeholders listen, collaborate, and innovate, that transforms insurance from a passive product into an active pillar of gig worker empowerment.

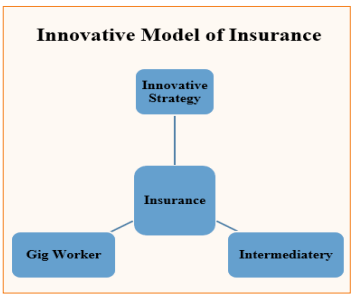

Fig 3 Innovative model of Insurance for Gigism

Innovative model is having mutual benefit to both gig community and companies associated with gig workforce. Further, it is confirmed from the research questions and statements that Gig insurance is need of the hour because gig community is increasing by surpassing its own targets. Gig community will increase to 50 million by 2030, so strategic innovation for gig insurance is required. Engaged stakeholders believe that this initiative can empower gig workers with affordable coverage, ensuring financial stability.

Data Validation and interpretation

For meaningful insights data has been validated for categorical items in the thematic analysis by a statistical tool known as *Cohen's Kappa.* In current study data has been categorised separately and its *Kappa value* (k) stands >0.89 means data is almost perfect and appropriate.

Conclusion

Insurance coverage provide gig workers financial security and peace of mind. Companies that offer insurance facility attract and retain better talent.

By providing insurance, gig companies can create a more sustainable, loyal workforce while mitigating risks and enhancing their market position. This balances cost, compliance, and worker satisfaction.

Further it is asserted that employer sponsored insurance plans with affordable premium is necessarily required for gig ecosystem. This will not only stabilize the economic aspect to family of gig worker but also protect their savings and income.

At conclude it is very important to formulate the inclusive policy of insurance for exclusive gig workers at the end of government bodies in consultation with the perception of engaged stakeholders. This strategic innovation not only benefit the insurance industry as whole but will also serve an economical financial tool for survival of gig livelihood. Innovative strategy in insurance policy for the gig community provides symbiotic benefit to all the stakeholders of study exclusively and will prevent the millions of breadwinners. TJ

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Health Insurance and Customer's Willingness to Engage Digitally

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Abstract

Data is the lifeline of an insurance industry and it's impossible to even think of insurance industry without Data. The insurance sector has historically been a data driven industry, which collects and processes a significant amount of personal data, including health related information.

Post pandemic, Insurance companies are trying to embrace technology and relying on Blockchain, Artificial intelligence & Data analytics to understand customer behavior, predict risk more accurately, and conduct marketing campaigns more effectively. Insurance industry is utilizing data analytics for providing customized products & services to their customers for better customer experience & engagement.

The study systematically reviews and analyzes the willingness of Health Insurance customers to engage digitally with their insurance company, adopting a mixed-methods approach of qualitative interviews with quantitative survey analysis.

Data for this study was collected from a sample of 145 respondents using standardized questionnaire. The questionnaire was developed with input from experts from the industry and was pretested to ensure clarity and consistency.

Through this analysis, the study seeks to provide actionable insights for health insurance companies to improve customer engagements through adopting technology to foster long-term win-win relationships with policyholders.

Keywords

Health insurance, Customer Retention, Wellness Programme,

Service Quality, DPDP Act 2023, Technology.

1. Introduction

1.1 Strengthening of Data Protection Regime in India

To safeguard the personal digital data, a Digital Personal Data Protection Bill, 2023 was enacted by the Indian Parliament.

According to the DPDP Act 2023, the Data" means a representation of information, facts, concepts, opinions or instructions in a manner suitable for communication, interpretation or processing by human beings or by automated means. The DPDP Act applies to personal data Processed within India or Processed outside India, if it pertains to business activity related to individuals within India.

The provisions of this Act apply to the processing of digital personal data, where the personal data is collected from Data Principals online or if the personal data collected offline is being digitized subsequently. The individuals to whom the personal data relates to are the Data Principals e,g, Policyholder of a Health Insurance company and the entity, who decides the means & purpose of processing personal data are termed as Data Fiduciaries (e.g. Health Insurance company in case of data of their customers).

The burden of proving compliance in data collection and processing is on the Data Fiduciaries.

Data Fiduciary should collect and process only as much data as necessary for specified purposes and the personal data that is collected can be stored forever by default.

There should be reasonable safeguards to ensure that there is "No unauthorized collection or processing of personal data and the person who decides the purpose and means of the processing of personal data should be accountable for such processing". A consent has to be taken from individuals before their data is processed and "every individual should know what items of personal data to be collected and their purpose", in their vernacular language.

As the Health insurance companies are collecting various data from the customers, the provisions of this act are likely to be applicable to the insurance industry unless the government exempts insurance companies.

The bill proposes to impose significant penalties on businesses that undergo data breaches or fail to notify users when breaches happen. The penalties to be imposed for any violation of the provisions mentioned in the act ranges from Rs. 50 crores to Rs. 250 crores.

1.2 Health care System in India

India's healthcare system is vast and complex, made up of both public and private players that serve the country's 1.4 billion people. Health care system has many challenges like infrastructure, a shortage of doctors and nurses, geographical imbalances and proper public & private financial funding.

Table 1: Key Health Financing Indicators for India across NHA rounds*

S.No.	Indicator	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
1	Total Health Expenditure (THE) as percent of GDP	4	3.9	3.8	3.8	3.3	3.2	3.3	3.7	3.8
2	Total Health Expenditure (THE) per capita (Rs) at current Prices	3638	3826	4226	4381	4297	4470	4863	5436	6602
3	Total Health Expenditure (THE) per capita (Rs) at constant prices**	3174	3231	3405	3503	3333	3314	3516	3752	4205
4	Current Health Expenditure (CHE) as percent of THE	93	93.4	93.7	92.8	88.5	90.6	90.5	89.7	87.3

S.No.	Indicator	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
5	Government Health Expenditure (GHE) as percent of THE	28.6	29	30.6	32.4	40.8	40.6	41.4	42.8	48
6	Out of Pocket Expenditures (OOPE) as percent of THE	64.2	62.6	60.6	58.7	48.8	48.2	47.1	44.4	39.4
7	Social Security Expenditure on Health as percent of THE	6	5.7	6.3	7.3	9	9.6	9.3	8.6	8.7
8	Private Health Insurance Expenditures as percent of THE	3.4	3.7	4.2	4.7	5.8	6.6	7	7.3	7.4
9	External/Donor Funding for Health as percent of THE	0.3	0.7	0.7	0.6	0.5	0.4	0.5	0.7	1.1
*	Source: NHA estimates for various years, NHSRC, MoHFW, MoSPI & Registrar General of India									
**	GDP Deflators were used to the constant series (2011-12 prices). GDP deflators were calculated from GDP series available at mospi.gov.in									

From Table 1 (S. no.-5), the Government Health expenditure to the total Health expenditure has gone up from 28.6 % in FY 2013-14 to 48% in FY 2021-22. India's healthcare system is going through a positive transformation, with many new changes and initiatives being taken.

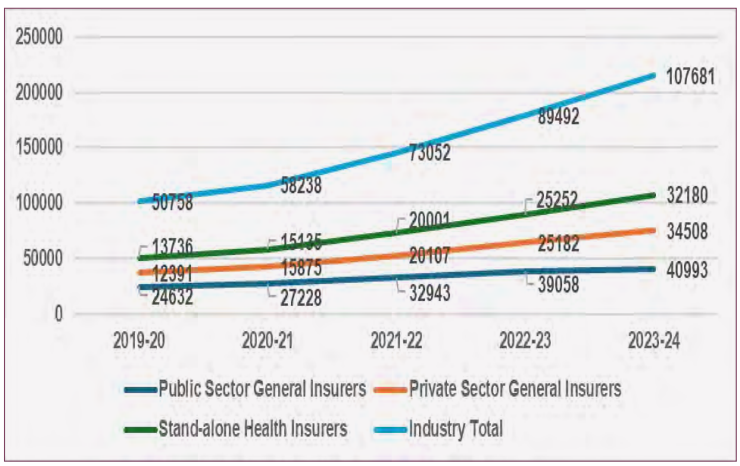
National Health Claim Exchange has been set up as part of the Ayushman Bharat Digital Mission (ABDM) by the National Health Authority (NHA) in collaboration with the Insurance Regulatory and Development Authority of India (IRDAI) in 2022 to make health insurance claims easier, quicker, and consistent across the country.

1.3 Health Insurance Industry and its growth

The health of a person is subject to wide variety of risks. Since health risk affects all sections of society, access to insurance-based healthcare is found to be a powerful weapon in economic empowerment.

From Graph: 1, it is quite evident that the Health Insurance industry is growing at a steady pace, and it has grown from Rs 50758 Crore in FY 2019-20 to Rs 107681 Crore by FY 2023-24.

Graph: 1 Trends in Health Insurance Premium in Cr (Excluding PA & Travel Insurance)



2. Research Methodology

This study employs a mixed-methods approach that integrates qualitative and quantitative strategies to gain a comprehensive understanding of customer willingness for Digital engagement and sharing their Data with insurance companies. The objective was to examine the data systematically to address the research questions.

The qualitative phase explores various components of Health Insurance industry along with the customer perceptions and experiences through Focus Group discussions with the Health Insurance industry experts, while the quantitative phase statistically examines the relationships between key factors—such as customer willingness to share their Data and various Digital engagements through wellness programmes and telemedicine.

The convenience sampling method was employed to select sample elements, with respondents selected based on their availability and willingness to participate in the study.

3. Objectives of the Study

- To understand the usage of Data in the health insurance sector.
- To analyze the Health Insurance customer's willingness to engage Digitally
- To analyze the willingness of customers to adopt Wellness Programme
- To recommend actionable strategies for improving customer engagement.

4. Literature Review

In recent years, the landscape of the health insurance sector in India has been reshaped by the growing emphasis on customer-centric services and technology-driven wellness programs. As internet penetration has surged (Singh et al., 2024), digital platforms have become more accessible and affordable, enabling insurers to engage customers in innovative ways that extend beyond traditional coverage.

One emerging strategy is the integration of wellness services into insurance offerings. Wellness is a multifaceted concept encompassing physical, mental, social, emotional, spiritual, and environmental well-being, and is typically divided into preventive programs (such as fitness routines, healthy diets, mental health care) and post-operative services (including counseling and therapy).

For both insurers and customers, wellness programs offer notable benefits. A healthier insured population reduces claim frequency and severity, leading to lower healthcare costs, increased savings, and longer lifespan—especially when lifestyle factors such as regular exercise, nutrition, and avoidance of alcohol and tobacco are prioritized (American Heart Association, 2024).

Insurance companies are now leveraging digital monitoring tools like smartphones, smartwatches, and fitness bands to track wellness activities such as running, cycling, and walking. These efforts enable timely medical interventions, promote healthier lifestyles, and allow insurers to incentivize customers through premium discounts, health check-up credits, and redeemable health points, creating a sense of value and motivation.

The provision of digital tools that promote health and wellness offers substantial benefits not only to policyholders but also to insurers and society at large. For insurers, these tools enhance underwriting precision by enabling access to richer datasets and actionable insights. They support product differentiation, providing a competitive advantage in an increasingly dynamic market. Additionally, digital wellness platforms strengthen customer acquisition, engagement, and retention by fostering personalized interactions and encouraging proactive health management. Ultimately, such initiatives contribute to long-term cost containment and improved return on sales, positioning insurers for sustained success as highlighted in (OECD, 2024)

"Customer preferences in General Insurance Industry in India" S. Venkata Seshaih (2006), emphasizes on the interactions of the insurer with their customers in the better understanding of their products and services.

According to "Health Wearables: Ensuring Fairness, Preventing Discrimination and promoting equity in an Emerging Internet-of-Things Environment" Kathryn Montgomery, Jeff Chester and Katharina Kopp, Wearables with Internet-connected

sensors are being extensively used to reduce the healthcare cost and increasing the customer engagement.

5. Data Analysis

We collected data on a 5- point Likert scale from 145 respondents of the health insurance policyholders, out of which 28.6% had an Individual Mediclaim Policy, 48.5% are covered under a Group Health Policy, and 22.8% hold both Group and Individual Mediclaim policies.

Table 2: Policyholders Ratings on the Importance of Digital engagement & Wellness programme

Level of Importance	Percent
Not Important	2%
Slightly Important	3%
Moderately Important	14%
Important	37%
Very Important	44%
Total	100%

A total of 145 policyholders rated the importance of digital engagement and wellness programmes in their health insurance experience. As per Table 2, 44% of the respondents considered these features to be very important, followed by 37% who rated them as important. This indicates that over 81% of policyholders place high value on digital engagement and wellness initiatives. Meanwhile, 14% found them moderately important, and only a small fraction—3% and 2%—rated them as slightly important or not important, respectively. These findings highlight a strong preference among policyholders for digitally enabled and wellness-focused insurance services

Table 3: Customer Retention by Perceived Importance of Digital Engagement & Wellness Programme

Level of Importance	Customer Retention
Not/ Slightly Important	3.42
Important/ Very Important	4.02
Grand Total	**3.98**

From Table 3, the strong positive sentiment is further reflected in the customer retention scores. Policyholders who rated these features as important or very important reported a higher average retention score of 4.02, compared to a much lower score of 3.42 among those who considered them not or slightly important. The overall average retention score stands at 3.98.

This suggests a clear correlation between the perceived importance of digital engagement and wellness initiatives and customer loyalty. In essence, policyholders who value these features are more likely to remain with their insurance provider, highlighting the strategic importance of investing in digital and wellness-driven customer experiences.

Table 4: Customer Loyalty by Perceived Importance of Digital engagement & Wellness Programme

Level of Importance	Customer Loyalty
Not/ Slightly Important	3.31
Important/ Very Important	3.99
Grand Total	**3.95**

From Table 4, the relationship between policyholders' perception of digital engagement and wellness programmes and their customer loyalty is clear. Policyholders who rated these features as important or very important reported a significantly higher average loyalty score of 3.99, compared to just 3.31 among those who considered them not or slightly important. The overall average loyalty score stands at 3.95, reinforcing the trend observed in the retention data. These findings suggest that digital engagement and wellness initiatives not only enhance customer retention but also foster stronger loyalty.

Table 5: Descriptive Statistics of Policyholders Perception on Digital Engagement & Wellness Programme

Statement	Mean	Median	Mode	SD	Kurtosis
The website of the Insurance Company/Third Party Administrator is user friendly	3.74	4	4	0.85	1.47

Statement	Mean	Median	Mode	SD	Kurtosis
My Insurance company/TPA keep updating me through smartphones / mails about my policy claim status, benefits accrued/payment status/ Renewal of policy/Any new product.	3.70	4	4	0.91	0.95
The digital engagement helps me in better understanding of my Health insurance policy & it's related services.	3.82	4	4	0.82	2.23
Are you comfortable sharing your physical activity/ Health data and getting some incentive from your Health Insurance company on renewals of premium	3.61	4	4	0.96	0.52
I will be happy, if my Insurer provides me telemedicine facility.	3.96	4	4	0.78	3.18

Based on the statistical data presented in Table 5, respondents showed a favorable attitude toward digital touchpoints used by insurance companies. The statement "The website of the Insurance Company/ TPA is user-friendly" received a mean score of 3.74, with a strong clustering around the mode and median of 4. Its standard deviation (0.85) suggests moderate consistency, while a kurtosis of 1.47 indicates a relatively peaked distribution—implying most users found the websites easy to navigate.

The perception of digital updates via smartphones and email about policy and claim-related matters was similarly positive, with a mean of 3.70 and a mode/median of 4. However, a slightly higher standard deviation of 0.91 and a kurtosis of 0.95 reflect more varied experiences among respondents—though still generally favorable.

When it comes to understanding health insurance and related services through digital engagement, participants rated this as the highest among the first three statements, with a mean of 3.82 and a narrow spread (SD = 0.82). The kurtosis value of 2.23 suggests concentrated agreement, emphasizing the value users place on accessible digital information.

Comfortable with sharing health data in exchange for incentives received the lowest mean score at 3.61, albeit with a consistent median and mode of 4. The standard deviation of 0.96 and lower kurtosis (0.52) reflect a broader range of opinions and possible privacy concerns or varying levels of trust among customers.

The strongest agreement was observed for telemedicine services, which achieved the highest mean score of 3.96. With a minimal standard deviation of 0.78 and a kurtosis of 3.18, responses were tightly concentrated around positive ratings—highlighting strong customer interest in remote health care access.

In summary, while most digital interactions are perceived positively, telemedicine stands out as the most embraced feature.

Reliability Test

Table 6: Cronbach Alpha for Policyholder Perception about Digital Engagement & Wellness Programme

Perception	No. of Items	Cronbach Alpha
Digital Engagement & Wellness Programme	5	.820

Table 6 represents the reliability analysis of the questionnaire items related to policyholders' perceptions of Digital Engagement & Wellness Programme, showing Cronbach's Alpha value of 0.820 across 5 items. demonstrate high internal consistency and reliability. This suggests that the questionnaire is well-constructed and that the data collected is consistent.

Table 7: Factor Analysis on Policyholder Perception about Digital Engagement & Wellness Programme

Perception	Statement	1
Digital Engagement & Wellness Programme	The website of the Insurance Company/Third Party Administrator is user friendly	0.672
	My Insurance company/TPA keep updating me through smartphones /mails about my policy claim status, benefits accrued/payment status/Renewal of policy/ Any new product.	0.643
	The digital engagement helps me in better understanding of my Health insurance policy & it's related services.	0.656
	Are you comfortable sharing your physical activity/ Health data and getting some incentive from your Health Insurance company on renewals of premium	0.513

The factor analysis (Table 7) reveals a single underlying factor representing policyholders' perception of digital engagement and wellness initiatives. All four statements show moderate to strong loadings, indicating they are meaningfully associated with this common factor:

User-friendly website: Loading of 0.672 suggests that ease of navigation and accessibility of the insurer's digital platform is a key component of positive perception.

Digital updates via smartphones/ mails: Loading of 0.643 reflects the importance of timely and transparent communication regarding claims, benefits, and renewals.

Better understanding through digital engagement: Loading of 0.656 highlights how digital tools enhance policyholders' comprehension of their insurance coverage and services.

Comfort with sharing health data for incentives: Loading of 0.513 indicates a moderate association, showing that while data sharing is part of the digital experience, it may be perceived with slightly more caution.

Conclusion

The digital engagement and wellness initiatives not only enhance customer retention but also foster stronger loyalty.

Customers were willing to have telemedicine facility from their Health insurance provider and Insurance companies can tie-up with Health experts in providing this facility for a better customer engagement. This will be a win-win situation for both Customers and their Health Insurance providers for a longer relationship and advocacy.

The existing health insurance customers are little apprehensive about the safety of their data, which must be addressed with adopting stringent data security measures in the Health Insurance industry.

The insurance industry, being a custodian of the personal data of their policy holders, needs to be extra cautious in safeguarding the data of their policy holders and building trust. TJ

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Risk Pooling for Resilience: The Evolving Landscape of Insurance Pools in a Volatile World

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Abstract

Insurance pools have proven to be important mechanisms for improving financial resiliency and equitable risk-sharing in the context of increasing global uncertainty and interconnected risks. This article thoroughly examines insurance pooling, including its theoretical underpinnings, typologies, operational models, and current innovations. Drawing on global and Indian examples, including terrorism, nuclear, and marine cargo pools, the study explores how pooled structures mitigate diverse hazards such as climate disasters, cyber threats, and agricultural volatility. It investigates the functions of public-private partnerships, reinsurance markets, parametric triggers and smart contracts based on blockchain technology in transforming pooling mechanisms. The paper explores governance issues such as moral hazard, adverse selection and fairness gaps. The paper also anticipates future trends of AI-enabled underwriting, embedded micro-pooling, and insurance solutions introducing ESG factors. Drawing from empirical research and policy frameworks, this study highlights the transformative possibilities of insurance pools for creating sustainable, equitable, and tech-enabled risk management across economies.

Keywords

Insurance Pool, Risk pool, Pooling, Catastrophe Pool, Reinsurance pool, Mutual Insurance, Risk sharing, India.

Section 1: Introduction

Risk pooling has become a vital method for sustainable insurance in an increasingly unpredictable and interconnected world. Insurance risk pools allow individuals, companies, and/or governments to share financial risks associated with catastrophic events, such as natural disasters, cyberattacks, crop failures, pandemics, and mortality shocks. Risk pooling mechanisms are now seen as accessible, scalable, and economically feasible methods for spreading the burden of unanticipated losses in developed and developing contexts.

The global risk landscape has shifted dramatically over the past two decades. New and increased dangers, such as weather events linked to climate change and cyber breaches, have pointed to the failures of the traditional and siloed insurance model

Pooled insurance mechanisms have been successful in emerging economies in sectors such as agriculture and health, where low-income households and farmers bear individual, solo costs, and volatile risk. For example, Nyebar et al. (2024) state that addressing credit risk in commercial agriculture would benefit from collective finance and insurance structures as risk pools. In the same way, Sharma and Walters (2020) point out varied stakeholder outcomes for farmers depending on farm size and diverse insured status

regarding crop insurance, which provides additional evidence in favour of structured pooling.

Pooling is prevalent in advanced actuarial modelling and data-driven underwriting in modern insurance theory and practice. Malavasi et al. (2022) use statistical models to learn more about cyber risk pooling processes as an example of pooling methodology. Once again, these modern formulations of pool are not simply in regard to physical risks, but are being developed and applied to digital and operational exposures in a hyper-connected economy.

In light of these trends, this article thoroughly analyses insurance pools, including their theoretical basis, types, uses, and limitations. We include selected empirical studies from the peer-reviewed literature to inform and illustrate how pooling mechanisms have adjusted to different risk types, economic arrangements, and technology.

Section 2: Typologies of Insurance Pools

Insurance pools exist in various configurations that address different needs, risks, and institutional contexts.

2.1 Public vs. Private Insurance Pools

- **Public Insurance Pools**

  Public insurance pools are established to mitigate market failures where private insurance coverage is unavailable or unaffordable for systemic or high-severity risks.

- **Private Insurance Pools**

  Private insurance pools are developed by private insurers, industry groups, or cooperatives. They may be voluntary or mutual, operating with the intent of commercial risk-sharing.

Private pools usually rely on actuarial pricing and compete in the market, although they may also collaborate with public entities under hybrid arrangements.

2.2 Risk-Based Classification

2.2.1 Catastrophic Pools

Catastrophic pools are designed to absorb some losses related to infrequent high-severity events, such as earthquakes, hurricanes, floods and pandemics. These pools also use risk retention, reinsurance, and parametric triggers to pay claims.

2.2.2 Cyber Risk Pools

Given the escalation of digital threats, cyber risk pooling is a new form of amelioration. Cyber pools facilitate the insurer community to share data, models, and exposures, reducing accumulation exposures in the re/reinsurance portfolio.

2.2.3 Pools of mortality and longevity

Risk deal with demographic risks such as premature death or living too long, and are especially pertinent in life insurance and pensions.

2.2.4 Pools of agricultural insurance

Help to diversify weather and commodity-related risks in the agriculture sector. State-operated insurers, farmer cooperatives, or commercial banks can organise agricultural pools.

2.3 Governance-Based Classification

2.3.1 Mutual Insurance Pools

Members own and manage these on a non-profit or community-benefit basis. Members are both an insured and an owner, like Health cooperatives, Ethnic or religious mutuals and Employee benefit pools, etc.

2.3.2 Peer-to-Peer (P2P) Insurance

P2P pools leverage technology to connect individuals with similar risk profiles, allowing them to self-insure collectively.

2.4 Hybrid and International Pools

Many insurance pools utilise a hybrid model, including public subsidies with private management or local risk sharing with global reinsurance. For example:

- Global pandemic risk pools proposed by the World Bank and the WHO
- Multilateral climate insurance facilities (e.g. for small islands) under the UNFCCC
- Index-based risk transfer pools combining sovereign risk pools with international reinsurers

2.5 Voluntary vs. Mandatory Pools

Mandatory pools require all subscribers to participate (e.g. Motor insurance liability pools in some countries). Voluntary pools rely upon informed choice and market incentives (e.g. employer self-insured health funds). Mandatory participation can result in greater risk homogeneity; however, poor management may raise issues of freedom of contract and efficiency.

Section 3: Insurance Pool in India

GIC Re administers several specialised insurance pools, including the Nuclear Pool, the Terrorism Pool, and the Marine Cargo Excluded Territories (MCET) Pool. It also receives obligatory cessions from domestic general insurers on each policy issued, within specified limits.

3.1 Terrorism Pool

The Indian Market Terrorism Risk Insurance Pool was established in April 2002 through a collective initiative of all non-life insurers in India, following the withdrawal of terrorism coverage by international reinsurers after the 9/11 attacks. GIC Re administers the pool and provides terrorism risk coverage as part of property insurance policies that cover residential buildings and other fixed assets in many locations.

3.2 Nuclear Pool

The Civil Liability for Nuclear Damage Act, 2010, requires safeguarding against unforeseen and potentially severe risks from nuclear incidents. Since conventional insurance policies typically exclude nuclear hazards due to the substantial capacity they demand, the Indian Nuclear Insurance Pool (INIP) was established in 2015 to address this gap. Managed by GIC Re, the pool offers liability coverage to nuclear operators and suppliers in India.

3.3 Marine Cargo Excluded Territories Pool (MCET Pool)

In the wake of the Russia-Ukraine conflict, international sanctions pulled back reinsurance support for marine cargo shipments of fertilisers and other goods from Belarus, Ukraine, and the Russian Federation, collectively referred to as 'Excluded Territories'. In 2022, to fill this gap in coverage for Indian policyholders, the Marine Cargo Excluded Territories Pool (MCET Pool) was created at the initiative of the General Insurance Council and managed by GIC Re. The purpose of the pool is to allow member insurers to provide coverage for marine cargo shipments of fertilisers, imports and exports for Indian insureds that involve the Excluded Territories, as well as for additional commodities as warranted, with pricing and terms needing approval from the Pool's Underwriting Committee.

3.4 Third-party Motor Insurance pool

The Third-party Motor Insurance Pool was first created in 2007. However, it ceased in 2012 because of large losses for underwriters, notwithstanding the pooling of third-party liability, which was unsustainable for the insurance industry.

In response, the insurance regulator introduced a revised framework known as the Third-party Motor Insurance "Declined Risk Pool." Under this arrangement, all general insurers, regardless of size, must underwrite third-party motor insurance policies in proportion to their respective market shares. This ensures equitable distribution of high-risk cases while enforcing compliance with statutory obligations.

3.5 Declined risk pool

A Declined Risk Pool is established to assist insurers with third-party claims, specifically for those high-risk vehicles that a company chooses not to offer coverage. The objective of the Declined Risk Pool is to honour third-party claims without undue hardship or burden to any individual insurer.

The management of the Declined Risk Pool is under the oversight of the General Insurance Corporation of India (GIC Re). GIC Re is responsible for the annual review of premiums collected and claims paid with regard to facilitated pool operationalisation. Participating insurers must submit audited transaction reports to GIC Re every quarter.

3.6 Members' Share in Indian Market Terrorism Risk Insurance Pool (Rs in Crore)

Table 1: Members' Share in Indian Market Terrorism Risk Insurance Pool (Rs in Crore)

S. No	Member Company	2022-23		2023-24	
		Per risk Capacity	Share (in %)	Per risk Capacity	Share (in %)
1	General Insurance Corporation of India	333.69	16.68%	333.69	16.68%
2	The New India Assurance Co. Ltd.	333.69	16.68%	333.69	16.68%
3	United India Insurance Co. Ltd.	250.05	12.50%	250.05	12.50%
4	The Oriental Insurance Co. Ltd.	238.31	11.92%	238.31	11.92%
5	ICICI Lombard General Insurance Co. Ltd.	180.84	9.04%	180.84	9.04%
6	Bajaj Allianz General Insurance Co. Ltd.	106.28	5.31%	106.28	5.31%
7	IFFCO-Tokio General Insurance Co. Ltd.	78.64	3.93%	78.64	3.93%
8	Reliance General Insurance Co. Ltd.	39.72	1.99%	39.72	1.99%
9	Cholamandalam General Insurance Co. Ltd.	39.06	1.95%	39.06	1.95%
10	Tata-AIG General Insurance Co. Ltd.	31.46	1.57%	31.46	1.57%
11	Future Generali General Insurance Co. Ltd.	28.16	1.41%	28.16	1.41%
12	Royal Sundaram Insurance Co. Ltd.	27.72	1.39%	27.72	1.39%
13	Liberty General Insurance Co. Ltd.	20.81	1.04%	20.81	1.04%
14	National Insurance Co. Ltd.	167.62	8.38%	167.62	8.38%
15	Govt. Insurance Fund, Gujarat	20	1.00%	20	1.00%
16	Shriram General Insurance Co. Ltd.	20	1.00%	20	1.00%
17	SBI General Insurance Co. Ltd.	15.62	0.78%	15.62	0.78%
18	HDFC Ergo General Insurance Co. Ltd.	15	0.75%	15	0.75%
19	Magma HDI General Insurance Co. Ltd.	10.32	0.52%	10.32	0.52%
20	Kotak Mahindra General Insurance Co. Ltd.	10	0.50%	10	0.50%
21	Universal Sompo General Insurance Co. Ltd.	10	0.50%	10	0.50%
22	Raheja QBE General Insurance Co. Ltd.	1	0.05%	1	0.05%
23	Go Digit General Insurance Ltd.	10	0.50%	10	0.50%
24	Navi General Insurance Co. Ltd.	2	0.10%	2	0.10%
25	Zuno General Insurance Co. Ltd.	10	0.50%	10	0.50%
	Total	**2000**	**100.00%**	**2000**	**100.00%**

Source: IRDAI Annual Report 2023-24

3.7: Members Share in Indian Nuclear Insurance Pool (Rs in Crore)

Table 2: Members' Share in Indian Nuclear Insurance Pool (Rs in Crore)

S. No	Member Company	2022-23		2023-24	
		Per risk Capacity	Share (in %)	Per risk Capacity	Share (in %)
1	General Insurance Corporation of India	600	40.00%	600	40.00%
2	New India Assurance Company Ltd.	300	20.00%	300	20.00%
3	United India Insurance Company Ltd.	200	13.33%	200	13.33%
4	Oriental Insurance Company Ltd.	100	6.67%	100	6.67%
5	National Insurance Company India	100	6.67%	100	6.67%
6	ICICI Lombard General Insurance Company	100	6.67%	100	6.67%
7	Reliance General Insurance Company Ltd.	20	1.33%	20	1.33%
8	Tata AIG General Insurance Company Ltd.	20	1.33%	20	1.33%
9	IFFCO Tokio General Insurance Company Ltd.	20	1.33%	20	1.33%
10	Cholamandalam General Insurance Company Ltd.	15	1.00%	15	1.00%
11	SBI General Insurance Company Ltd.	15	1.00%	15	1.00%
12	Universal Sompo General Insurance Company Ltd.	10	0.67%	10	0.67%
	Total	**1500**	**100.00%**	**1500**	**100.00%**

Source: IRDAI Annual Report 2023-24

3.8 Members Share in Marine Cargo Excluded Territories Pool (Rs in Crore)

Table 3: Members' Share in Marine Cargo Excluded Territories Pool (Rs in Crore)

S. No	Member Company	2022-23		2023-24	
		Per risk Capacity	Share (in %)	Per risk Capacity	Share (in %)
1	General Insurance Corporation of India	250	51.57%	250	52.21%
2	National Insurance Company India Ltd.	30	6.19%	30	6.27%
3	New India Assurance Company Ltd.	40	8.25%	40	8.35%
4	Oriental Insurance Company Ltd.	30	6.19%	30	6.27%
5	United India Insurance Company	20	4.13%	20	4.18%
6	Bajaj Allianz General Insurance Co. Ltd.	2.5	0.52%	2.5	0.52%
7	Cholamandalam General Insurance Company Ltd.	1	0.21%	1	0.21%
8	Zuno General Insurance Co. Ltd.	0.3	0.06%	0.3	0.06%
9	Go Digit General Insurance Ltd.	3	0.62%	5	1.04%
10	HDFC Ergo General Insurance Co. Ltd.	6	1.24%	6	1.25%
11	ICICI Lombard General Insurance Company	30	6.19%	30	6.27%
12	IFFCO Tokio General Insurance Company Ltd.	8	1.65%	8	1.67%
13	Kotak Mahindra General Insurance Co. Ltd.	1	0.21%	1	0.21%
14	Magma HDI General Insurance Co. Ltd.	5	1.03%	5	1.04%
15	Reliance General Insurance Company Ltd.	8	1.65%	8	1.67%
16	Royal Sundaram Insurance Co. Ltd.	4	0.83%	4	0.84%
17	SBI General Insurance Company Ltd.	5	1.03%	5	1.04%
18	Shriram General Insurance Co. Ltd.	1	0.21%	1	0.21%
19	Tata AIG General Insurance Company Ltd.	30	6.19%	30	6.27%
20	Universal Sompo General Insurance Company Ltd.	2	0.41%	2	0.42%
21	Future Generali General Insurance Co. Ltd.	8	1.65%	0	0.00%
	Grand Total	**484.8**	**100.00%**	**478.8**	**100.00%**

Source: IRDAI Annual Report 2023-24

Section 4: Global and Regional Catastrophe Pools

During the past twenty years, national governments, multilateral institutions, and reinsurance companies have partnered to create global and regional catastrophe risk pools. These risk pools, developed for specific risks and regions, combine technical, subsidy, and parametric triggers to fund rapid, scalable assistance.

4.1 African Risk Capacity (ARC)

- A dedicated agency of the African Union.
- Offers parametric insurance for drought to African states.
- Offers a weather data point to trigger payouts of food security activities.
- Supports developing the capacity to design and manage sovereign insurance programs.

4.2 Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC)

Covers hazards, including hurricanes, earthquakes, and excess rainfall, across the Caribbean and Central America countries - The first regional fund to deploy parametric insurance operating in a multicountry pool - Funded through the World Bank and major reinsurers - Allows rapid payments to be triggered so governments can access funds to

undertake emergency operations immediately.

4.3 Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)

- Targeted at Pacific Island countries at risk for cyclones and tsunamis,
- Provides catastrophe risk modelling, early warning tools and financing.
- Funded by ADB, Japan, and additional donors.

4.4 Southeast Asia Disaster Risk Insurance Facility (SEADRIF)

- Addresses flood-related risks in Southeast Asia.
- It combines insurance, resilience investments, and planning for financial contingencies.
- Housing both public and private coordination and reinsurance.

Section 5: Effectiveness, Governance, and Challenges

While insurance pools have great risk pooling capabilities, they only work if they are governed appropriately, are sustainable to operate, and have engaged stakeholders.

5.1 Measuring Effectiveness in Insurance Pools

Pooled insurance systems will be evaluated on their quantitative and qualitative measures, such as coverage ratio, payout speed, participant satisfaction, capital adequacy, stability of loss ratio, and long-term sustainability.

5.2 Regulatory and Legal Challenges

Insurance pools often operate in complex regulatory regimes, present a range of regulatory challenges, including:

- Cross-jurisdictional compliance and reporting: with respect to regional or international pools
- Data privacy laws: find application with respect to cyber pools and, amongst others, digital health insurance
- Licensure obligations: with respect to providing regulated products from a P2P or mutual perspective
- Solvency supervision: which means pools must have capital adequacy under frameworks such as Solvency II or RBC (Risk-Based Capital)

This ambiguity in the legal environment could impede innovation or involvement, and some jurisdictions have reacted to such uncertainty with regulatory sandboxes, new legislation to create specific insurance pools, or dedicated insurance pool innovations.

5.3 Challenges in Premium Collection and Subsidy Allocation

The affordability of premiums constitutes a major barrier to insurance pooling, especially in agriculture and health. To address this barrier, pools use a number of mechanisms, including:

- Premium subsidies
- Sliding-scale contributions
- Cross-subsidisation in the pool

However, premium subsidy mechanisms will tend to distort risk pricing, encourage adverse selection, or undermine long-term sustainability if subsidies are uncoordinated, poorly targeted, or delayed.

5.4 Moral Hazard and Adverse Selection

As with any insurance mechanism, pools face classic information asymmetry problems:

- Moral hazard: Pool participants may take higher risks or fail to mitigate known hazards, assuming they are protected.
- Adverse selection: High-risk individuals are more likely to enrol unless underwriting filters are applied.

Solutions include:

- Group-based insurance that enforces peer accountability
- Parametric insurance, which avoids subjective claim validation
- Technology-enabled risk scoring for dynamic contribution adjustments

5.5 Operational Challenges

Insurance pools must address the following logistical and administrative issues:

- Data availability and quality: Particularly for new risks like cyber or climate change
- Claims management systems: Including digitisation and fraud prevention
- Capacity building: Training local insurers, cooperatives, and agents
- Public awareness and literacy: Crucial for voluntary or mutual models

Failure in these areas can erode trust, increase dropout rates, or generate reputational risk for the scheme.

5.6 Dependency on External Funding

Especially in disaster and health-related pools, there is a concern about donor dependency. While start-up grants or contingent credit lines may be necessary in early stages, long-term reliance can:

- Create fiscal vulnerabilities
- Undermine ownership by local stakeholders
- Delay the development of local insurance markets

To avoid this, experts recommend transition strategies from donor-led to locally capitalised and reinsured pools and gradual premium cost-sharing by participants.

5.7 Equity and Inclusion Gaps

Although insurance pools aim to promote inclusion, design flaws can perpetuate inequalities:

- **Gender gaps:** Women may lack access to formal land titles or financial tools needed to enrol.
- **Regional bias:** Urban areas may receive better support than remote locations.
- **Digital divide:** Exclusion of non-tech-savvy populations in app-based P2P insurance models.

Integrating social inclusion frameworks, participatory design, and **data disaggregation** helps address these concerns.

Section 6: Conclusion

Amid rising global uncertainties from climate change and geopolitical shocks to cyber risks and public health emergencies, insurance pools have developed into fundamental tools of improving financial resilience, access to coverage and shared risk. The paper provided an overview of the theory, structure, practice and future innovation of insurance pooling from a global and Indian perspective.

As a concept, insurance pooling embodies the principle of solidarity where the many protect the few, and risk is shared to make losses more manageable. Whether through public catastrophe pools, private mutual schemes, or hybrid public-private partnerships, the model allows for the aggregation of exposures and the spreading of costs, creating an efficient, equitable, and scalable insurance mechanism. Empirical evidence, such as the effectiveness of India's Terrorism and Nuclear Pools or the rapid payouts facilitated by CCRIF in the Caribbean, demonstrates the practical success and adaptability of pooling mechanisms in both mature and emerging markets.

At the same time, insurance pools are not without challenges. Issues of moral hazard, adverse selection, operational inefficiencies, governance shortcomings, and subsidy dependence continue to test their sustainability. Gender-based, digital, regional, and financial equity gaps must be actively addressed through inclusive design and transparent implementation. Any insurance pool's credibility and long-term viability hinge on sound actuarial science, capital sufficiency, trust, participation, and effective regulatory oversight.

Ultimately, insurance pools offer a robust, adaptable, and future-ready framework for navigating complex risk landscapes. When designed inclusively, governed ethically, and enabled by technology, they hold transformative potential not just as risk management tools but as levers for financial inclusion, economic stability, and social resilience. Policymakers, insurers, reinsurers, and technology providers must therefore collaborate to foster robust pooling ecosystems that can withstand shocks, promote equity, and deliver on the promise of shared security in an increasingly uncertain world. TJ

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From Protection to Prosperity: The Role of Insurance in India's Economic Vision

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Debojyoti is working as Senior Vice President and Head with Edelweiss Life Insurance. Debojyoti has over 20 years of domain experience in the field of Strategy, Sales and Business Development (Alliances), Project Management, Training and Investments across international borders. Debojyoti spearheaded critical assignments which include setting up new channel lines for an organization, bringing about disruptive changes for long-term sustainable growth and profitability for the organization. Debojyoti enjoy Triple Master's Degree and had several publications in insurance and OB and OD, including one in an ABDC list of journal.

Abstract

This article presents a comprehensive analysis of India's insurance sector, emphasizing its evolving role in economic development, financial inclusion, and digital transformation. The study aims to evaluate the sector's contribution to GDP, assess the impact of recent regulatory reforms—particularly the GST exemption on individual policies—and explore the strategic initiatives under IRDAI's "Insurance for All by 2047" vision.

Using a synthesis of government data, industry reports, and policy frameworks, the report identifies key trends such as rising premium volumes, expanding digital distribution, and increased foreign investment.

It concludes that India's insurance industry is entering a high-growth phase, driven by technology, simplified products, and inclusive outreach. However, challenges like regulatory adaptation, talent gaps, and data security must be addressed to ensure sustainable progress.

The findings underscore the sector's potential to act as a catalyst for economic resilience and social protection in India's next phase of growth.

Keywords

Insurance, Regulator, Life, Products, Bima Sugam, Bima Vahak, Bima Vistaar, Bima Trinity.

Objective

This article explores India's life insurance sector transformation amid regulatory changes, digital innovation, and economic growth. It analyses key reforms, market trends, and initiatives, such as Bima Trinity, to demonstrate their impact on customer engagement, product design, and distribution. The goal is to guide BFSI leaders in strategic decision-making.

Introduction

India's insurance sector significantly supports GDP growth through premium mobilization, employment, and capital formation. In FY25, the sector contributed ₹11.2 lakh crore in total premiums, growing 7.7% year-on-year. Of this, life insurance alone contributed ₹8.7 lakh crore, marking a 5.2% increase. The new business premium (NBP) for life insurance stood at ₹3,97,336 crore, driven by a surge in individual policy sales and digital outreach.[1][2][3]

Despite being the fifth-largest life insurance market globally, India's insurance penetration remains modest at 3.7%, with life insurance at 2.8%, below the global average of 7%. Life insurance plays a dual role—offering financial protection

and acting as a long-term savings vehicle. It channels household savings into government securities and infrastructure, aiding capital formation. With rising awareness, digitalization, and regulatory reforms, life insurance is poised to be a key driver of India's inclusive and resilient economic growth. [4][5]

Background of Industry and the Distribution

India is expected to be the fastest-growing economy among the G20 countries over the next 10 years (from 2025 to 2034), with an average yearly growth of 6.2% after adjusting for inflation, and about 10% without adjusting for inflation. For the next two years, India's economy is expected to grow by around 6.9% annually, up from 6.5% in 2024 and surpassing the average of 5.8% observed over the past decade. [Table 1] This strong growth will mainly come from higher spending by people, more private investments, and ongoing economic reforms. Last year, rural demand picked up again, which is important because around 64% of Indians live in rural areas. Global economic growth, expected to be 2.8% in 2025 and 2.7% in 2026, will also help India. Inflation is slowing down, following a global trend, and it is likely to stay within the Reserve Bank of India's target range of 4% plus or minus 2% in 2025. As a result, there may be interest rate cuts this year, which would further support economic growth.

India will be the fastest growing insurance market in the G20 over the next five years

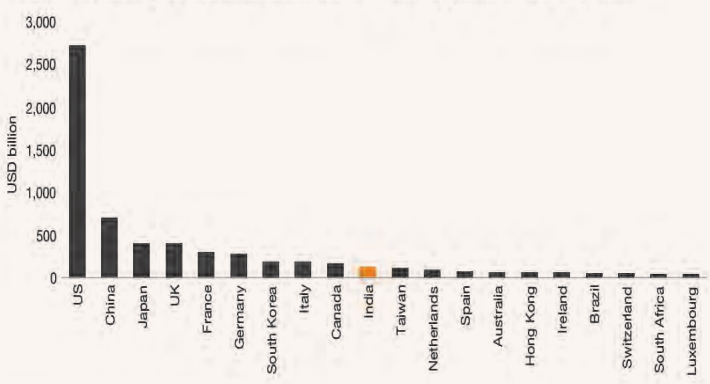
We forecast that India's insurance market will be the fastest growing of the G20, with 7.3% average annual growth in 2025-2029.

Table 1	Premium volume (in USD billion)		Change (in %, inflation adjusted)		Share of world market (in %)	Insurance penetration (in % of GDP)	Insurance density (in USD)
	2024F	2029F	2024F	CAGR 2025F–29F	2024F	2024F	2024F
Total business							
India	148	238	5.0%	7.3%	1.9%	3.8%	102.2
Emerging markets	1 487	2 110	6.6%	4.9%	19.1%	3.2%	187.5
Emerging Asia excl. China	237	365	4.8%	6.4%	3.0%	3.0%	98.7
Global	7 770	9 837	4.6%	2.5%	100.0%	7.1%	864.2
Life business							
India	110	173	4.8%	6.9%	3.3%	2.8%	75.6
Emerging markets	875	1 262	7.9%	5.3%	26.2%	1.9%	110.4
Emerging Asia excl. China	166	252	4.4%	6.0%	5.0%	2.1%	69.4
Global	3 337	4 265	5.1%	2.7%	100.0%	3.1%	371.1
Non-life business							
India	39	65	5.7%	8.4%	0.9%	1.0%	26.6
Emerging markets	612	847	4.8%	4.4%	13.8%	1.3%	77.1
Emerging Asia excl. China	70	113	5.9%	7.2%	1.6%	0.9%	29.5
Global	4 433	5 572	4.3%	2.3%	100.0%	4.1%	493.1

Note: F = forecast; CAGR = compound annual growth rate. Source: Swiss Re Institute

India's insurance sector is expected to grow steadily due to strong economic factors, digital advancements, and supportive government regulations. Recent rule changes are likely to make insurance more accessible to buyers while improving transparency and ease of doing business for companies over time. Life insurance remains the largest part of the market, making up about 74% of total premiums. In 2024, life insurance premiums are expected to grow by 4.8% after adjusting for inflation and by 5% in 2025.

Chart 1 Top 20 largest insurance markets in the world by premium volumes, 2021

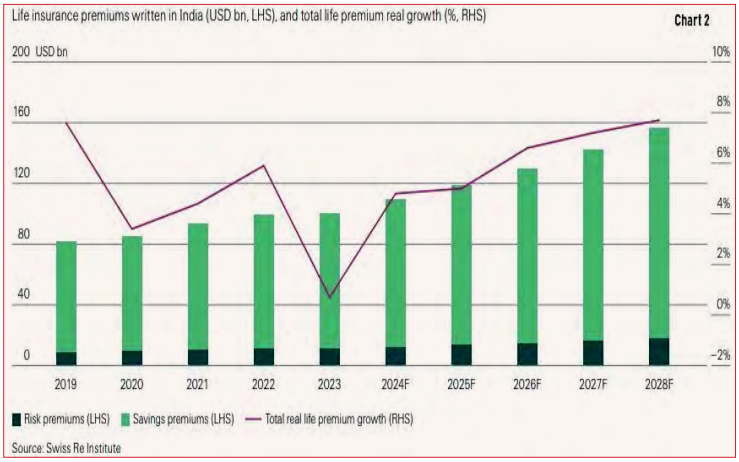


Source: Swiss Re Sigma Reports, Various Issues

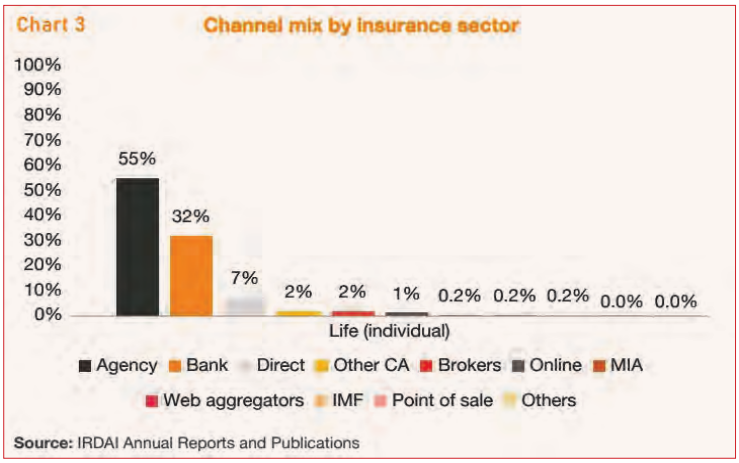
From 2025 to 2029, growth is projected to average around 6.9%. This follows slower growth of just 0.7% in 2023, which was affected by new tax and regulatory rules. The life insurance sector is still adapting to these changes, which could cause some short-term fluctuations in profits. However, growing demand for products that combine savings and protection could help keep demand steady. In general insurance (non-life), premium growth is expected to stay at 5.7% in 2024 and increase to 7.3% in 2025. People are becoming more aware of the need for insurance, and with the economy growing strongly and continued digital improvements, the sector is expected to benefit. Health

and motor insurance are the biggest parts of the non-life segment. Agricultural insurance is also seeing better prospects due to updates made in 2023 to the government's crop insurance plan, the Pradhan Mantri Fasal Bima Yojana (PMFBY), which has led to more farmers getting insured. India's economic growth is moving forward alongside its plan to reach net-zero carbon emissions by 2070.

The insurance industry in India is expected to grow faster in the next ten years. This growth is being driven by easier regulations, quick digital advancements by insurance companies, and greater customer awareness.[Chart 2]



Globally, the insurance industry is seen as a key player in maintaining financial stability during tough times. Insurance companies also play a big role in strengthening capital markets by investing a large part of their funds—over half—into bonds and stocks. [Chart 1] Because of their large investments in the economy, insurers help keep market confidence steady, especially during financial crises.



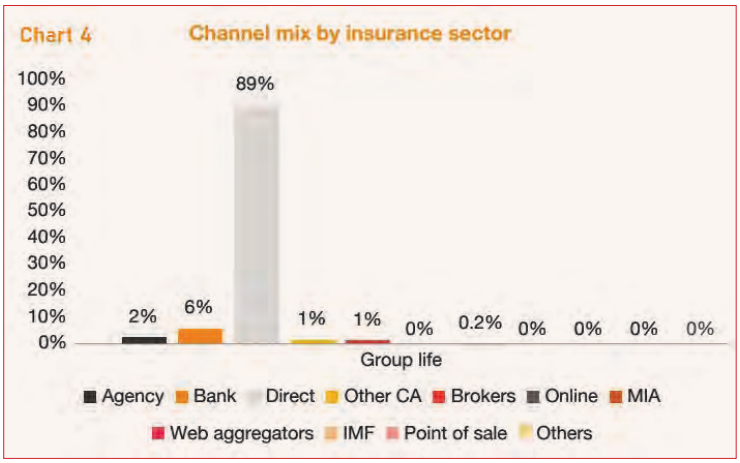
Traditional distribution methods are still the main way insurance is sold. However, new rules allowing banks and insurers to work together more easily and changes in commission payment rules will help these traditional channels grow even more. But, with over 700 million internet users in India, including around 425 million in rural areas by early 2023, the way insurance is distributed could change. Digital platforms, online marketplaces, and digital systems are expected to become the main way insurance is sold, making it easier to reach people in remote areas and improving the customer experience. [Chart 3, 4, 5, 6]

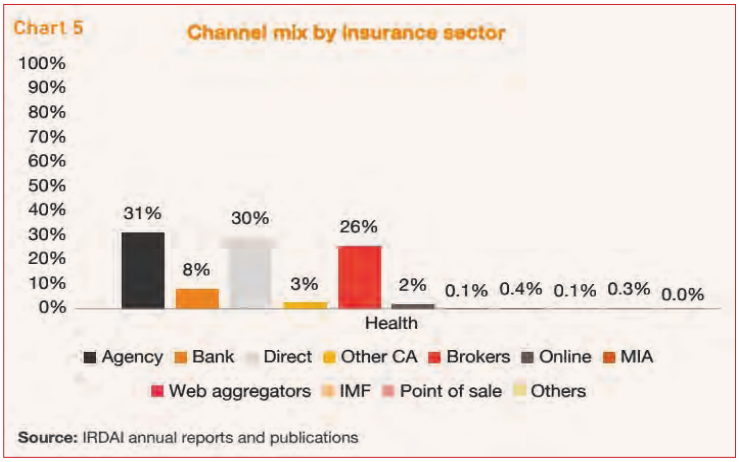
What is the recent Development in the Indian Insurance space

As per the 56th GST Council Meeting held in September 2025, the Indian government has introduced landmark GST reforms for the insurance sector. Here are the key updates:

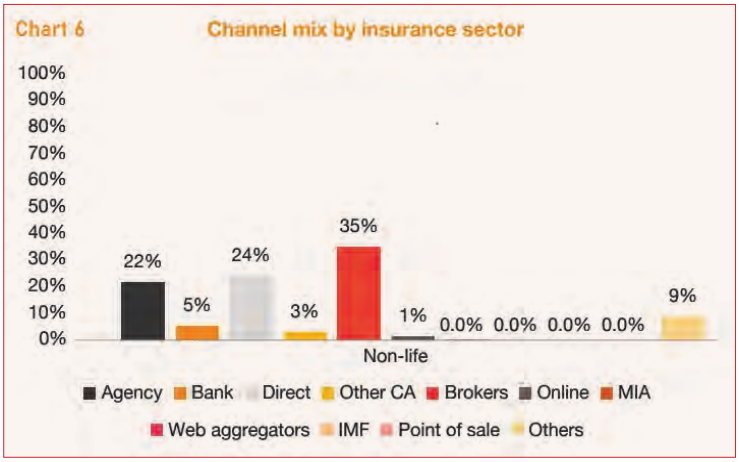
New GST Rules for Insurance Policies (Effective 22 September 2025)

1. **GST Exemption on Individual Insurance Policies**:
   - **Life Insurance**: All individual life insurance policies—term life, ULIPs, and endowment plans—are now exempt from GST.
   - **Health Insurance**: All individual health insurance policies, including family floater and senior citizen plans, are also exempt from GST. [6]





Source: IRDAI annual reports and publications



- **Reinsurance** of both life and health insurance policies is included in the exemption.[7] [8]
- **Previous GST Rate**, earlier, these policies attracted 18% GST, which significantly increased premium costs.

2. **Impact on Premiums**:
   - The exemption is expected to reduce premiums by nearly 18%, making insurance more affordable and boosting penetration, especially among middle-class and rural populations.[9]
3. **Scope**:
   - The exemption does not apply to group insurance or motor insurance policies, which will continue to attract GST. [10]

What are the key initiatives undertaken by the Indian Government and the Industry?

A 2024 RBI report, cited by Ken Research Group [11], indicated a significant increase in financial literacy related to life insurance, especially among younger professionals.

In the Indian insurance industry, these developments are aimed at boosting the country's low insurance penetration rates and meeting evolving customer needs. [12][13]

a. Regulatory and Market Initiatives

- **"Insurance for All by 2047":** The IRDAI is spearheading

this mission to ensure every citizen and enterprise has comprehensive insurance coverage. This target is driving many of the recent regulatory changes and product innovations.

- **"Bima Trinity":** To increase accessibility and awareness, IRDAI has rolled out three key initiatives:
  - **Bima Sugam:** A single online portal that acts as a one-stop shop for all insurance needs, from policy purchase and renewal to claim settlement.
  - **Bima Vahak:** A program that deploys a women-centric sales force in every village to ensure last-mile delivery of insurance products.
  - **Bima Vistaar:** A bundled, affordable, and simple insurance product specifically designed for the rural population to cover life, health, and property.
- **Composite licensing:** The introduction of composite licensing, which allows a single insurer to sell both life and non-life products, is a major reform aimed at reducing costs and offering a wider range of products to consumers.
- **Simplified products:** Regulators are promoting the standardization and simplification of products, such as the *Saral Jeevan Bima* (life) and *Arogya Sanjeevani* (health) covers, to make them easier for customers to understand.

b. Technological innovation

- AI and automation.
- Embedded and usage-based insurance (UBI).
- Cloud and data analytics.
- Blockchain.

c. New and evolving risks

- Cybersecurity and cyber insurance.
- Climate risk and parametric insurance.
- Healthcare risks.

d. Distribution and customer experience

- Omnichannel engagement.
- Agent-led distribution.
- Addressing mis-selling.

What is the rationale behind of IRDA on these steps?

The Rationale behind key IRDAI initiatives is in line with the Government's vision:

a. **Bima Trinity projects** (Bima Sugam, Bima Vistaar, Bima Vahak)

- **Expansion of access:** These projects are designed to significantly increase insurance penetration, particularly in rural and underserved areas. **Bima Vahaks**, who are local women agents, create last-mile connectivity and build trust within communities.
- **Affordability: Bima Vistaar** offers bundled, affordable products that combine life, health, accident, and property insurance, making comprehensive coverage accessible to low-income populations.
- **Convenience and transparency:** The **Bima Sugam** platform simplifies the entire insurance lifecycle, from comparing and buying policies to filing and tracking claims, all in one place. This demystifies the process for consumers and reduces dependency on intermediaries.

b. **Standardizing products** (e.g., Saral Jeevan Bima, Arogya Sanjeevani)

- Simplification and consumer trust:
- Reduced mis-selling.
- Efficient claims settlement.

c. **Composite licensing**

Multiple sources, including *The Economic Times*, noted that the government planned to introduce a bill in the 2024 Budget session to permit composite licensing, which would allow a single entity to offer both life and non-life products.

- **Operational efficiency:** The current framework forces insurers to set up multiple entities to operate in different segments (life, non-life, health). Allowing composite licenses would enable insurers to offer a wider range of products under one entity, reducing operational costs and administrative burdens.
- **Product innovation:** This reform would allow for the creation of innovative, bundled products that offer a combination of life, health, and general insurance coverage. This offers greater convenience and comprehensive protection to policyholders.
- **Enhanced distribution:** A composite license would allow a single agent or partner to sell all types of insurance, creating a more seamless experience for customers and boosting distribution efficiency.

d. **Higher Foreign Direct Investment (FDI) limit**

- **Increased capital inflow:** Reports from IBEF and *The Indian Express* confirm that the government has increased the FDI limit to 100%, with the intent to attract fresh capital and introduce global best practices. [13]
- **Global best practices and technology:** Foreign insurers bring advanced technology, operational expertise, and global best practices that can improve efficiency, drive innovation, and enhance customer service across the industry.
- **Boosted competition:** Higher FDI encourages more players to enter the market, fostering greater competition that ultimately leads to better products, services, and pricing for customers.

e. **Health insurance reforms** (removing age limits and reducing waiting periods)

IRDAI 2024 guidelines removed the entry age limit, reduced the pre-existing disease waiting period to three years, and prohibited rejection of policies for severe illnesses. [14]

- **Financial inclusion and security:** Removing the upper age limit ensures that senior citizens can access health insurance at any age.
- **Reduced financial burden:** By reducing waiting periods for pre-existing diseases, policyholders can receive coverage and financial relief sooner for long-standing health issues.
- **Consumer trust:** These reforms helps building greater trust and encouraging more people to opt for coverage.

f. **Digitization and Insure-Tech**

- Accessibility and customer experience.
- Enhanced efficiency.
- Regulatory push for transformation.

g. **Streamlining regulation**

In addition to specific policy changes, the government is committed to modernizing the regulatory framework to support the sector's growth.

- Insurance Amendment Bill.
- Reduced capital requirements.
- Rationalized framework.

The government and IRDAI are focused on building consumer trust, simplifying products, and expanding coverage to underserved segments.

- **Simpler products:** Standardizing products like *Saral Jeevan Bima* and *Arogya Sanjeevani* is a direct response to government concerns about complex, confusing policies that often lead to mis-selling and mistrust among consumers.
- **Inclusive health insurance**: Recent IRDAI guidelines, which removed the entry age limit and reduced the waiting period for pre-existing diseases, reflect the government's push for more inclusive and accessible health insurance, especially for senior citizens.

- **Targeted schemes**: IRDAI's annual report for 2023-24 highlighted that microinsurance premiums surpassed ₹10,000 crore for the first time, fuelled by government schemes like the Pradhan Mantri Jeevan Jyoti Bima Yojana and Pradhan Mantri Suraksha Bima Yojana. The Bima Vahak network also demonstrates a targeted effort to improve rural reach.

The life insurance industry is adjusting to recent regulatory changes: taxation [15] on high premium policies (2023), expenses of management (EOM) regulations (2023), unit linked insurance plan (ULIP) taxation (2024), and surrender norm changes (2024).[16] The new surrender norms implemented in October 2024 in particular may lead to some short-term volatility in profit margins and changes in product and commission structures. [17] However, growing interest in protection products that embody both credit and protection components may mitigate the adverse effect on overall demand.

What are the Government concerns?

Senior finance ministry officials have reportedly flagged issues such as:

- Unjustified premium hikes, particularly in health insurance.
- Persistent customer complaints regarding claims settlement.
- Weak corporate governance practices in certain companies.
- Slight decline in overall insurance penetration in recent years.

In summary, the government's outlook for the Indian insurance sector is one of strategic, technology-driven growth, balanced with a strong commitment to consumer protection and market integrity. By relaxing regulatory norms, inviting foreign capital, and leveraging digital platforms, the government aims to create a more competitive, efficient, and inclusive insurance market that aligns with its larger economic and social development goals.

Short term and long-term implications?

The regulatory and technological changes in the Indian insurance industry are poised to have significant short- and long-term implications, shaping market dynamics, operational efficiency, and consumer engagement

In the short term, the industry will experience a period of adjustment, while the long term points toward a more robust, competitive, and customer-centric ecosystem aligned with the "Insurance for All by 2047" goal. [Table 1]

Table 1	Market and competition	Product and distribution	Customer experience
Short-term implications	• Increased competition • Pricing pressures • Disruption for agents. • Initial integration challenges	• Faster product launches: "Use and File" framework. • Simplified offerings	• Increased digital friction. • Boost in confidence.
Long-term implications	• Accelerated growth and penetration. • Industry consolidation: • Global alignment.	• Integrated product ecosystem. • Data-driven underwriting and pricing. • Phygital distribution model.	• Enhanced transparency and trust . • Effortless claims settlement. • Focus on wellness and prevention.

What could be the possible challenges?

- **Regulatory oversight**: With increased innovation and digitization, the IRDAI will need to continuously evolve its regulatory framework to address new risks like cyber threats, data privacy breaches, and algorithmic bias in underwriting.

- **Talent gaps**: The industry will need to upskill its workforce to effectively manage and leverage the new wave of technology, from AI and data analytics to specialized product design.
- **Data security**: As more sensitive customer data moves to digital platforms, cybersecurity and data privacy will remain a critical, long-term challenge for both regulators and insurers.

What could be the possible scope and the recommendations?

To navigate the dynamic Indian insurance landscape and successfully capitalize on current trends, insurers must adopt a multi-pronged approach that blends technological innovation with a customer-centric and ethical focus.

The following are key actionable recommendations based on the points discussed. [Table 2]

T2	Key Recommendation	Action Areas
1	Accelerate digital transformation strategically	• Prioritize data mastery. • Embrace modular and agile tech. • Leverage AI for efficiency and personalization.
2	Strengthen distribution and market reach	• Maximize the Bima Trinity. • Master the "Phygital". • Adopt embedded insurance
3	Build and maintain customer trust	• Increase transparency and simplify language. • Prioritize a frictionless claims process. • Protect data with robust cybersecurity.
4	Adapt to the evolving regulatory landscape	• Leverage composite licensing. • Embrace proactive change management. • Engage constructively with the regulator.
5	. Address the talent and skills gap	• Invest in upskilling and reskilling. • Attract new-age talent. • Leverage new distribution roles

Summary

The Indian insurance sector is in a period of rapid transformation, few key points to sum up:

- Digital transformation: Insurers should strategically accelerate digitization by prioritizing data mastery, using modular technology, and leveraging AI for personalized customer engagement and risk assessment.
- Distribution strategy: Maximize the use of the Bima Trinity initiatives and adopt a blended "phygital" model. Pursue strategic partnerships for embedded insurance to reach new customer segments.
- Customer trust: Build trust through greater transparency, simplified language, and a frictionless, empathetic claims process. Robust cybersecurity measures are essential for protecting customer data.
- Regulatory adaptation: Engage proactively with regulators to anticipate and adapt to changes like composite licensing and FDI liberalization. Prepare for ongoing regulatory evolution.
- Talent management: Invest in upskilling and reskilling the workforce to handle new technologies. Repurpose the role of traditional agents into skilled advisors who use technology to enhance customer relationships. TJ

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A comprehensive review on the performance of PMSBY Scheme (Pradhan Mantri Suraksha Bima Yojana)

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Abstract

PMSBY (Pradhan Mantri Suraksha Bima Yojana) is one of the flagship schemes of Government of India, was launched in the year 2015. The scheme provides financial assistance to the policy holders or their nominees in the case of death or disability resulted from accidents with a nominal premium of less than Rs. 2/- per day. Since the launch of the scheme, the Public Sector General Insurance Companies (PSGICs') have been underwriting an average of 91.1% of the business while paying 93.3% of incurred claims. This has resulted a cumulative loss of Rs. 1000Crs to PSGIC's, clearly indicating scheme's unprofitability for General Insurance Companies. The article tries to delve into the details of scheme profitability in the years to come by using Time series and Regression analysis.

Keywords

PMSBY (Pradhan Mantri Suraksha Bima Yojana), ICR (Incurred Claim Ratio), NEC (Net Earned Premium), GDPI (Gross Domestic Premium Income), AIC (Akaike Information Criteria).

Introduction

In the year 2015, the prime minister of India, Shri Narendra Modi announced PMSBY (Pradhan Mantri Suraksha Bima Yojana), a scheme primarily aimed at providing financial assistance in the event of death or disability due to accidents. The scheme is one of the unprecedented social security schemes announced by the GOI in that year along with other PMJJBY (Pradhan Mantri Jeevan Jyoti Bima Yojana) and APY(Atal Pension Yojana). Before the introduction of PMSBY, India didn't have any specific scheme backed by Government of India, that would provide financial assistance to the poor and other disadvantage sections of the society in the event of accidents. Nevertheless, public and private general insurance up to that point were administering separate personal accidental policies to the general public.

Features of the Scheme

PMSBY is a one-year cover, renewable annually. It is administered through Public Sector General Insurance Companies and through other General Insurance companies willing to offer the product with the same terms and conditions. Persons having accounts in the participating banks/post-offices and between the ages of 18-70 years can enroll in the scheme by paying a nominal premium of Rs. 20/- per annum per person (revised from Rs. 12/- in 2022 due to adverse claims experience). The premium will also be deducted through auto-debit facility, if opted by the account holder. The scheme's enrollment period is from June to May every year.

The scheme offers the following benefits to the policy holders.

S.No.	Table of Benefits	Sum Insured
1	Death	Rs. 2 Lakh
2	Total and irrecoverable loss of both eyes or loss of use of both hands or feet or loss of sight of one eye and loss of use of hand or foot	Rs. 2 Lakh
3	Total and irrecoverable loss of sight of one eye or loss of use of one hand or foot	Rs. 1 Lakh

On the occasion of the completing 10 years since launch of the PMSBY, the Union Minster of State for Finance, Shri Pankaj Chaudary released a press statement and averred that as on 23.04.2025, the cumulative enrolments under PMSBY have been more than 51.06 crore and an amount of Rs. 3121.02 crore has been paid for 1,57,155 claims. This reflects the role played by PMSBY scheme in the financial inclusion.

Objectives of the Scheme

The overarching objective of introducing this PMSBY along with PMJJBY and APY is to provide the social security benefits to poor and other marginal communities of the society with affordable premium. The other subtle objective is to improve the insurance penetration in the country, which is measured as the ratio of premium underwritten in a particular year to the GDP of the country.

Since its launch, the PMSBY has contributed a significant premium to the General Insurance companies. From Rs. 107 Crs in FY17 to Rs. 685 Cr in FY24, the scheme has shown an exemplary growth rate of 540%. Cumulatively, PMSBY has contributed a total of 0.16% of total GDPI (Gross Domestic Premium Income) of all the general insurance companies excluding SAHI (Standalone Health Insurance) & special insurance companies over the combined 8-year period.

Penetration Puzzle

Despite the General Insurance industry's robust growth, its penetration—calculated as the ratio of total General Insurance Premium to the country's GDP—has remained stagnant at approximately 1% since FY21, rising only marginally from 0.94% in the preceding year. This plateau persists even as both the numerator and the denominator have seen significant increases. For instance, the Pradhan Mantri Suraksha Bima Yojana (PMSBY) has contributed substantially to the premium corpus with a Compound Annual Growth Rate (CAGR) of 30.46%, and the overall General Insurance premium grew at an impressive 11.18% CAGR between FY20 and FY24. Simultaneously, the country's nominal GDP increased at a 10.1% CAGR. The constancy of the 1% penetration level, therefore, indicates that while the General Insurance sector is expanding rapidly, its premium growth is not sufficiently outpacing the nation's economic expansion (GDP growth) to achieve a higher level of insurance market depth.

Redefining Penetration

Digressing from the topic of the PMSBY, the inconsistency in the calculation of penetration in the insurance sector, compared with other sectors, is worth to mention at this point. Many industry veterans feel that the calculation of the insurance penetration should align with how telecom penetration is determined. Telecom penetration, also known as tele-density is calculated as the ratio of number of telecom subscribers to total population of the country. It is not calculated as the total telecom revenue to the total GDP of the country. Likewise, if the insurance penetration were calculated by assessing number of people having at least one insurance policy against the number of people in the country, it would provide a more realistic insurance penetration in the country.

Almost all states are providing health services to marginal sections of the society either through Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) or through their self-regulated schemes. The GOI through several schemes such as PMSBY, PMJJBY, and PMJDY(Pradhan Mantri Jan Dhan Yojana) is also providing insurance schemes with affordable premiums to economically weaker sections of the society. While more than 54%

vehicles in India are plying on roads without insurance, it is plausible that individuals driving these vehicles may possess at least one health, personal accident or life insurance. Similarly, the "missing middle" as pointed out by NitiAyog in its report focusing on the need for affordable health insurance premiums, might have other insurance policies other than health insurance. If we consider all these factors, the estimated insurance penetration in India would exceed 70%.

Currently, India does not have any data base that can provide the details of persons holding at least one insurance policy. To address this, Insurance Industry, through its councils, may request the GOI to include the question on number of insurance policies a person has in the next population enumeration exercise, in order to determine the insurance penetration realistically.

Performance of the Scheme

Coming back to the performance of the PMSBY, apparently the scheme has achieved its objectives in terms of number of subscribers and the amount of claim disbursed. From 8.87 Crs subscribers in the FY17 to 34 Crs in FY24, the number of subscribers has increased with an overall CAGR of 21.15%. In the same period, the total amount of net claim disbursement increased from 185.13 Crs. to 595.60 Crs with cumulative claim payment of Rs. 2989 Crs over these 8 years.

Year	No. of Lives covered (in Crs.)	Claims Incurred Net (in Crs.)
2023-24	34.00	595.60
2022-23	25.44	438.66
2021-22	21.97	418.09
2020-21	16.06	375.16
2019-20	16.28	368.25
2018-19	13.42	413.91
2017-18	9.05	194.78
2016-17	8.88	185.13
Total	**145.089**	**2989.58**

Though the scheme is open to all the General Insurance companies operating in India, the Public Sector General Insurance Companies (PSGIC) have contributed more than private general insurance companies to the success of PMSBY. From FY17 to FY24, PSGIC's covered an average of 90.5% total lives under this scheme and paid an average of 93.3% of net claims during the same period. This large share in terms of number of lives and amount of claim coupled with inadequate premium, resulted severe losses to PSGIC's in the initial years of scheme's roll out. This substantial financial drain has continued untill the premium revision in the year FY22.

PSGICs have suffered a cumulative total loss of Rs. 1000 Crs for administering the scheme since FY17. The effect of this loss was marginal in FY23, and in FY24, there was even a surplus of Rs. 18 Crs for PSGICs. It is largely due to increase in the base premium from Rs. 12/- to Rs. 20/- by the GOI in 2022. However, the performance of the any insurance product is determined based on the combined ratio , which is calculated as the summation of Incurred Claim Ratio (ICR), Expenses Ratio and Commission Ratio. If it breaches 100%, it indicates that companies are losing money from underwriting the business. To determine the level of combined ratio in FY24 and to assess the expenses ratio and commission ratio, it is important to understand the terms of the conditions of the scheme.

Year	Net Earned Premium (in Cr.)	Net Incurred Claim (in Cr.)	ICR	Total Loss/ Surplus	Surplus/ Loss to PSGIC
2023-24	629	595.6	95%	33.53	18.34
2022-23	407	438.7	108%	-31.78	-24.321
2021-22	231	418.1	181%	-186.81	-163.37
2020-21	191	375.2	197%	-184.40	-169.19
2019-20	156	368.2	236%	-212.17	-204.9
2018-19	141	413.9	294%	-272.95	-267.12
2017-18	92	194.8	212%	-102.95	-93.002
2016-17	83	185.1	223%	-102.08	-96.00
Total Loss				**-1059.62**	**-999.57**

Expenses & Commission Ratio

Under the scheme's terms and conditions, for a fresh policy with a Rs. 20/- premium, the bank deducts Rs.1/- for administrative expenses and another Rs.1/- for Corporate Agent/Bank Correspondent commission. For renewal policies, only the Rs.1/- administrative expense is deducted. Consequently, banks remit Rs.18/- to insurance companies for fresh policies and Rs. 19/- for renewals. From this remitted premium, insurance companies may deduct an estimated Rs.3/- (15% of gross premium) for their own expenses, leaving a net premium of Rs.15/- for fresh policies and Rs.16/- for renewals reflected in their books.

S. No	Type of Policy	Gross Premium in Rs.	Bank Administrative Expenses	Agent/Bank Correspondent Commission	Insurance Company Expenses	Net Premium
1	Fresh	Rs. 20/-	Rs. 1/-	Rs. 1/-	Rs. 3/-	Rs. 15/-
2	Renewal	Rs.20/-	Rs.1/-	NA	Rs.3/-	Rs. 16/-

So, total expenses and commission account for 25% of the gross premium for fresh policies and 20% for renewal policies. When these ratios are added to the Incurred Claim Ratio (ICR) in FY24, the combined ratio reaches 120% for fresh policies and 115% for renewal policies. This elevated combined ratio in FY24 confirms the scheme's unprofitability for general insurance companies since its launch. Nevertheless, the reduction in ICR during FY23 and FY24 offers optimism that PMSBY will become profitable in the future.

It is important to understand whether the scheme with the current levels of premium and claims will ever become profitable to the General Insurance Companies. To analyze this, the Time series analysis is primarily used. However, the data is very scant which could hamper the credibility of the results. To supplement the results of Time series analysis, another technique –Regressions analysis has been used.

The major distinction between Time series analysis and Regression analysis is that the former is specifically designed to forecast data points that are inherently sequential (in this case, we have year wise net incurred claim and net earned premium). The core assumption is that a value in one year is dependent on the values of previous years and it models any seasonality or trends. On the other hand, Regression analysis assumes that each data point is inherently independent on the preceding data point there by assumes no correlation. However, both the methods offer very good forecasting mechanisms which helps to assess the scheme profitability in the near future.

The results arrived from the both the techniques are explained in the following paragraphs.

Time Series Analysis

To assess the scheme profitability over the next 5 years and understand its performance, the time series analysis was conducted using R software. For those unfamiliar, time series analysis is a statistical technique used to analyze the data collected over a period of time typically at consistent intervals such as monthly, quarterly or yearly. This technique is predominantly used to forecast the future values by using the underlying data patterns.

The primary metric for analyzing the profitability is the Incurred Claims Ratio, defined as a ratio of Net Incurred Claims and Net Earned Premium. To forecast Net Incurred Claims for the next 5 years, the data from FY17 to FY24 was analyzed using R software. An ***auto.arima*** function was employed to identify the optimal ARIMA model with less AIC (Akaike Information Criteria). Based on the provided data, the best-fitting model was determined to be ARIMA (0,1,0). A portion of these results is presented below.

```
Series: claimsts
ARIMA(0,1,0) with drift

Coefficients:
        drift
      58.6380
s.e.  32.9097

sigma^2 = 8845:  log likelihood = -41.2
AIC=86.4   AICc=89.4   BIC=86.29
```

The ARIMA (0,1,0) signifies that p=0, d=1 and q=0. The p=0 and q=0 values indicate that the current value in the differentiated series is not directly depend on the past values or on the previous forecast errors.

The value of d=1 means the time series was differentiated once to achieve stationarity there by removing patterns.

This result is anticipated given the number of Claims has shown a consistent linear upward trend year-on-year since FY17. Furthermore, the drift value in the results indicates that the future forecasted value will increase by approximately Rs. 58.6380 Crs. The standard error of Rs. 32.9097 Crs., suggests an inherent uncertainty in these forecasts. Other values from the results are not relevant for the current analysis.

The differentiated data, resulting from the ARIMA (0,1,0) was then forecasted for 5 years using ***forecast*** function with a 95% Confidence Interval (CI). The obtained results are as follows.

	Point Forecast	Lo 95	Hi 95
2025	654.2344	469.9068	838.562
2026	712.8724	452.1938	973.551
2027	771.5105	452.2457	1090.775
2028	830.1485	461.4933	1198.804
2029	888.7866	476.6175	1300.956

It can be observed from the above forecasted values that each subsequent value increases by approximately Rs. 58.6380 Cr., consistent with the previously determined drift value. The values of Lo 95 & Hi 95 represents lower and upper bounds of 95% prediction interval. For instance, based on the FY25 forecast, it can be concluded with 95% confidence that the actual claim value for FY25 will fall within the range of (469.9068 Crs., 838.562 Crs.)

Similarly, the net earned premium values are calculated. However, to enhance model fit and ensure reliable results, the number of lives covered from FY17 to FY24 are considered instead of the Net Earned Premium values for the same period, was used as an input for the R software. The outcome obtained after applying ***auto.arima*** function is as follows.

```
Series: Livests
ARIMA(0,1,0) with drift

Coefficients:
       drift
      3.5890
s.e.  1.0824

sigma^2 = 9.567:  log likelihood = -17.3
AIC=38.59   AICc=41.59   BIC=38.49
```

The model obtained in the case of number of lives covered replicates the claims model, thus requiring no further explanation here. The differentiated data from this ARIMA (0,1,0) was then forecasted for 5 years using ***forecast*** function with a CI of 95% and the following output has been obtained.

	Point Forecast	Lo 95	Hi 95
2025	37.58960	31.52727	43.65193
2026	41.17864	32.60521	49.75207
2027	44.76768	34.26741	55.26795
2028	48.35672	36.23205	60.48138
2029	51.94576	38.38997	65.50155

The forecasted number of lives are then used for calculating Gross Premium and ultimately Net Earned Premium as below.

Year	No. of Lives	Gross Premium in Crs.	Net Earned Premium in Crs.
2025	37.59	751.79	639.02
2026	41.18	823.57	700.04
2027	44.77	895.35	761.05
2028	48.36	967.13	822.06
2029	51.95	1038.92	883.08

The Gross Premium is assessed by multiplying the number of lives covered by Rs. 20/-. To calculate the Net Earned Premium, the Gross premium is multiplied by a factor of 0.85, representing the average of NEP to GP proportion from FY17 to FY24.

The value of Net ICR thus obtained by calculating as ratio of NEP and NIC is as follows.

Year	Net Earned Premium in Crs.	Net Incurred Claims in Crs.	Estimated ICR
2025	639.02	654.23	102.4%
2026	700.04	712.87	101.8%
2027	761.05	771.51	101.4%
2028	822.06	830.15	101.0%
2029	883.08	888.79	100.6%

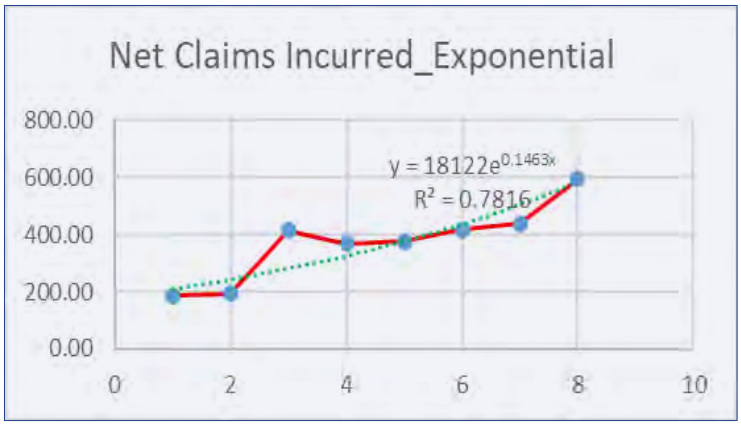
It can be observed that the ICR values are projected to decrease starting from FY25, indicating the scheme potential profitability in the near future. However, the applicability of time series analysis to the current dataset has limitations. For higher certainty and more reliable results, time series analysis typically requires at least 30-40 data points. Given that the analysis conducted here used only 8 data points, the obtained results may not be entirely meaningful and are susceptible to unstable forecasts.

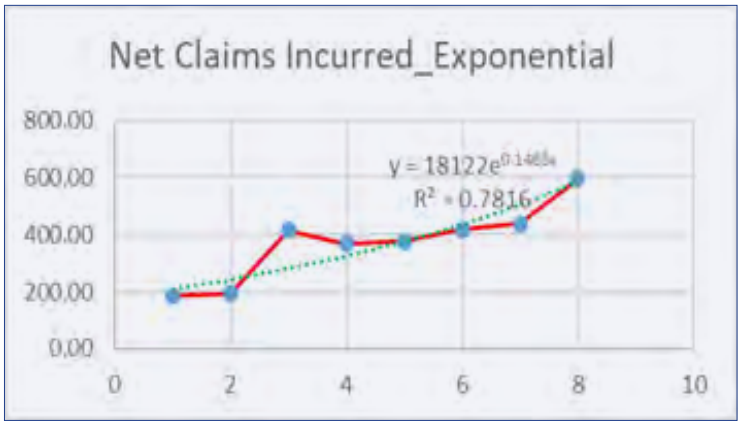
Since the primary goal of this time series analysis was not to achieve absolute accuracy but to ascertain if the scheme would become profitable in the coming years. Hence, the results obtained can still be used for drawing inferences. However, to minimize the uncertainty in these conclusions, regression analysis has been employed to supplement the findings.

Regression Analysis

Regression analysis involves finding a mathematical equation that best describes the relationship between a dependent variable and an independent variable. In the current analysis, the dependent variable is either Net Claim Amount or Number of Lives covered and an independent variable is Year.

A line chart was drawn plotting the values of Net Claims Amount or Number of lives on the Y-axis against the Year on the X-axis. An exponential trend line is fitted to this data while ensuring it has a higher R^2 value. The process yielded the equation $Y = 18122 * e^{0.1463X}$ for Net Claims and $Y = 696.53 * e^{0.1909X}$ for the No. of Lives. These equations are now being used to forecast the net incurred claims and number of lives for the next 5 years. The calculation procedure for Gross Premium and Net Earned Premium remains consistent with previous methodology.





The ICR values are calculated as ratio of Net Incurred claim and Net Earned Premium. The resulting values are as follows.

Year	Net Earned Premium In Cr.	Net Incurred Claim Amount in Cr.	ICR
2025	660.01	676.15	102%
2026	798.83	782.67	98%
2027	966.86	905.98	94%
2028	1170.23	1048.71	90%
2029	1416.37	1213.92	86%

Conclusion

It is noted that the results obtained from the Regression analysis are not identical to results obtained from Time Series analysis. The discrepancy is primarily attributed to the insufficient data used for forecasting the values.

Year	ICR obtained from Time Series Analysis	ICR obtained from Regression Analysis
2025	102.4%	102%
2026	101.8%	98%
2027	101.4%	94%
2028	101.0%	90%
2029	100.6%	86%

It's clear from the test results that the Incurred Claim Ratio (ICR) is on a downward trend. This outcome aligns with our expectations and the empirical analysis of the data. While the Number of Lives Covered increased by 21.15% annually from FY17 to FY24, Net Incurred Claims grew at a slower rate of 18.17%. This indicates that premium income is rising faster than net incurred claims, which should lead to a decreasing ICR in the future, assuming no catastrophic events significantly alter the claims trend.

As previously stated, the primary objective of this study is not to achieve precise ICR values but to assess the scheme's future profitability for General Insurance Companies. Profitability in Insurance company business is determined by the Combined Ratio, not solely by the Incurred Claim Ratio (ICR). Given that the expense ratio for fresh policies is 25% and for renewal policies is 20%, adding these to the forecasted ICR values from our test results indicates that the combined ratio will exceed 100% in the each of the next five years. This suggests the scheme may not generate adequate profits for the companies unless the Government of India increases the current premium.

Further Study

- If claim numbers are available, the study can be extended to estimate the adequate premium that should be charged by the Insurance Companies to achieve adequate profit by using the Frequency-Severity Analysis
- If age wise claims numbers and its associated amount is available for all the past years, the study can be extended to determine the precise price for the product by using GLM (Generalized Linear Model) technique- a statistical modelling technique predominantly used to model and predict outcomes that follows non-normal distributions. TJ

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Do Publicly Funded Health Insurance Schemes in India Protect Against Catastrophic Health Expenditure? Evidence from a Multilevel Modelling Approach

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Abstract

This study examines the efficacy of publicly funded health insurance (PFHI) schemes, including Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), in protecting Indian households from catastrophic health expenditure (CHE). Using nationally representative data from the 2022–23 Household Consumption Expenditure Survey covering 261,953 households and a multilevel modelling approach, the study reveals that about 8% of households incur CHE, with significant district-level variation. Unexpectedly, PFHI enrolment is associated with a higher risk of CHE, likely due to increased healthcare utilization, especially hospitalizations in private facilities. The study also identifies rural-urban disparities and heightened vulnerability among marginalized groups. State-level differences reflect variable scheme performance. Findings emphasize policy focus beyond insurance enrolment to enhance PFHI impact and progress towards universal health coverage in India.

Keywords

Catastrophic Health Expenditure (CHE); Health Insurance; Ayushman Bharat; Household Consumption Expenditure Survey; Multilevel Modelling.

Introduction

Launched in 2018, the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) is a flagship publicly funded health insurance (PFHI) scheme aimed at achieving Universal Health Coverage (UHC) in India by targeting the poorest 40% of the population, as identified through the Socio-Economic Caste Census (2011). This initiative signifies a pivotal shift toward integrated, need-based healthcare delivery and is central to India's strategy to advance the Sustainable Development Goals (SDGs) by addressing health inequities and expanding access to essential services (Press Information Bureau, 2024a).

Recent data from the National Health Accounts (NHA) for 2020–21 and 2021–22 indicate a substantial transformation in India's health financing landscape, with Out-of-Pocket Expenditure (OOPE) as a share of Total Health Expenditure declining markedly from 62.6% in 2014–15 to 39.4% in 2021–22 (Press Information Bureau, 2024b). While this trend suggests improved financial protection for households and reflects the government's increased commitment to equitable healthcare financing, the burden of healthcare costs remains significant. In particular, persistently high OOPE levels continue to expose households to CHE, typically defined as health spending exceeding a critical threshold of a household's resources.

CHE poses substantial risks not only to household economic stability but also to access and continuity of essential healthcare services. Therefore, understanding the incidence, spatial patterns, and determinants of CHE is crucial for informing health financing policies aimed at enhancing financial risk protection and promoting greater health equity.

This study leverages recently released, nationally representative microdata from the Household Consumption Expenditure Survey (HCES) 2022–23, conducted by the National Sample Survey Office (NSSO) under the Ministry of Statistics and Programme Implementation (MoSPI). The dataset encompasses detailed consumption and health expenditure data for 261,953 Indian households, including information on enrolment in government-sponsored health insurance schemes such as AB-PMJAY and various state-level public health protection programs.

The objective of this research is to quantify the incidence of CHE among Indian households and critically evaluate the extent to which PFHI schemes protect against this financial risk. In our analysis, OOPE includes unreimbursed direct payments by households for both hospitalization and non-hospitalization services (e.g., outpatient consultations, medicines, diagnostics). CHE is measured as annual OOPE exceeding 10% of household total consumption— a widely accepted threshold consistent with global standards facilitating international comparability (Garg et al., 2024; Santos et al., 2024; Waters et al., 2004; Wagstaff & Doorslaer, 2003).

A key strength of this study is its methodological design, which employs a multilevel binary logistic regression framework that acknowledges the hierarchical structure of the data, with households (Level 1) nested within districts (Level 2). Districts serve as important contextual units capturing regional differences in socioeconomic conditions, healthcare infrastructure, availability of health services, and program implementation quality. Such clustering can induce intra-class correlation, which if ignored, can bias estimates and underestimate standard errors. Employing this two-level approach allows for rigorous control of unobserved heterogeneity and provides more accurate, regionally nuanced estimates of CHE risk and insurance effectiveness (Bhattacharjee , 2022 ; Sommet & Morselli, 2017 ; Goldstein, 1995).

By directly linking health expenditure data with insurance enrolment status at the household level and accounting for spatial heterogeneity, this study delivers new insights into the real-world impacts of PFHI schemes across the diverse Indian context. Furthermore, by including both national and state-level schemes, the research facilitates comparative assessment of their relative effectiveness across regions with varied implementation dynamics. The findings are expected to contribute crucial empirical evidence to ongoing policy debates on the limitations and potential of PFHI programs in India.

Research Question and Statement of the Problem

The study addresses the following central research question: Does enrolment in PFHI schemes significantly reduce the likelihood of CHE after accounting for household, socioeconomic, and regional factors?

Thus, the study seeks to answer a broader policy question: Do PFHI schemes in India provide effective financial protection against catastrophic health expenditure, and how does this effect vary across regions and population groups?

Although the Government of India has expanded PFHI initiatives, their effectiveness in providing meaningful financial protection to households remains a subject of debate. Addressing these questions

is essential to evaluating whether India's PFHI architecture is fulfilling its intended purpose of mitigating the financial risks associated with healthcare utilization. The findings will contribute to evidence-based policy discourse on improving the design, targeting, and implementation of PFHI schemes to ensure equitable progress toward universal health coverage.

Related Literature

Research indicates that health insurance schemes sometimes paradoxically associate with increased CHE risk due to higher healthcare utilization (Thu Thong et al., 2021; Sparrow et al., 2013; Wagstaff & Lindelow, 2008). Systematic reviews emphasize policy and community-level factors as critical yet underexplored determinants of CHE incidence (Mohsin et al., 2024). India exhibits parallel challenges. Non-communicable diseases notably drive CHE (Kansra et al., 2025), with national schemes like AB-PMJAY facing scrutiny for limited financial protection efficacy, particularly in private healthcare contexts (Garg et al., 2024; Nanda & Sharma, 2023). Vulnerable populations such as the elderly bear disproportionate burdens (Ahmad & Mohanty, 2024), and implementation obstacles including claim management and provider regulation constrain scheme impact (Furtado et al., 2022).

While existing Indian studies provide valuable insights, they often lack nationwide representativeness, ignore regional heterogeneity, or do not simultaneously model household- and district-level factors influencing CHE. Addressing these gaps, this study applies a multilevel modelling approach to the nationally representative 2022–23 HCES data (covering over 260,000 households) to rigorously examine the incidence and determinants of CHE. It critically assesses the financial protection conferred by PFHI schemes, including AB-PMJAY, accounting for spatial variation and socio-demographic heterogeneity across districts. This approach enables comprehensive evaluation of public insurance schemes' effectiveness in reducing CHE within India's diverse healthcare landscape and informs targeted policy interventions to strengthen equitable health financing and financial risk protection.

Data and Methodology

This study employs a comprehensive set of variables to investigate the incidence and determinants of CHE in India. The outcome variable, CHE, is defined dichotomously that captures whether a household's out-of-pocket expenditure (OOPE) on health exceeds 10% of its annual consumption expenditure. This threshold, consistent with global standards, provides an internationally comparable and policy-relevant measure of financial hardship due to healthcare costs. The analysis is enriched by several predictor variables. The key variables used in this study are summarized in Table 1.

Table 1: Variables Definitions

Variable Name	Description	Code/Value
CHE	Catastrophic Health Expenditure: 1 if total OOPE > 10% of annual household consumption expenditure	1 = Yes (CHE), 2 = No
Scheme-Coverage	Any household member covered under PM-JAY or a state-level public health insurance scheme	1 = Yes, 2 = No
Hospitalization-case	Type of hospital (if any) used by any household member in the last 365 days	1 = Govt/Public, 2 = Private/ Charitable, 3 = Both, 4 = No hospitalisation
Ration-Card-Type	Proxy for economic status based on ration card held	1 = Antyodaya Anna Yojana, 2 = Below Poverty Line, 3 = Above Poverty Line, 4 = Priority Household, 5 = State Food Security Scheme, 9 = Others, 0 = No Ration Card

Variable Name	Description	Code/Value
Sector	Sector of household residence	1 = Rural, 2 = Urban
Social-Group	Social group of the household head	1 = ST, 2 = SC, 3 = OBC, 9 = Others, 0 = Not Reported
State-Name	State or Union Territory identifier for capturing contextual-level heterogeneity	1 = Jammu & Kashmir, 2 = Himachal Pradesh, 3 = Punjab, 4 = Chandigarh (U.T.), 5 = Uttarakhand, 6 = Haryana, 7 = Delhi, 8 = Rajasthan, 9 = Uttar Pradesh, 10 = Bihar, 11 = Sikkim, 12 = Arunachal Pradesh, 13 = Nagaland, 14 = Manipur, 15 = Mizoram, 16 = Tripura, 17 = Meghalaya, 18 = Assam, 19 = West Bengal, 20 = Jharkhand, 21 = Odisha, 22 = Chhattisgarh, 23 = Madhya Pradesh, 24 = Gujarat, 25 = Dadra & Nagar Haveli and Daman & Diu, 26 = Missing in the dataset, 27 = Maharashtra, 28 = Andhra Pradesh, 29 = Karnataka, 30 = Goa, 31 = Lakshadweep (U.T.), 32 = Kerala, 33 = Tamil Nadu, 34 = Puducherry (U.T.), 35 = Andaman and Nicobar Islands (U.T.), 36 = Telangana, and 37 = Ladakh (U.T.).

Source: HCES 2022-23

Given the hierarchical structure of the HCES 2023–24, where individual households (Level 1) are nested within districts (Level 2), the use of a multilevel modelling approach is both methodologically justified and statistically appropriate. This nested data arrangement implies that households within the same district may share contextual characteristics such as access to healthcare services, quality of local governance, and the effectiveness of public health scheme implementation which can lead to correlated outcomes. Such intra-cluster similarities violate the independence assumption underlying traditional single-level regression models, potentially resulting in biased coefficients, underestimated standard errors, and misleading inferences (Sommet & Morselli, 2017 and Goldstein, 1995). To address these methodological constraints, this study employs a two-level multilevel binary logistic regression model, which allows for the decomposition of variance in the likelihood of incurring CHE into household-level and district-level components, thereby improving estimation accuracy and model interpretability. At Level 1, the model includes household-specific predictors such as scheme coverage (e.g., AB-PMJAY or other PFHI), type of hospitalization case, sector of residence, type of ration card (as a proxy for economic status), and social group classification. These variables account for micro-level differences in healthcare access and financial vulnerability. At Level 2, the model captures unobserved district-level heterogeneity. While a three-level model could be used to include states explicitly, this study adopts a more parsimonious approach by incorporating state-level fixed effects within the two-level framework. This strategy effectively mitigates for macro-level policy and institutional variations across states and union territories, such as differences in health infrastructure and governance quality. Overall, the two-level multilevel binary logistic regression model offers a statistically robust and substantively meaningful framework for analysing the determinants of CHE, while appropriately accounting for the complex, clustered nature of the survey data.

In the equation 1 that follow, let Y_{ij} denote the binary response variable measured on the i^{th} household within the j^{th} district ($Y_{ij}=1$ denote the occurrence of "CHE" while $Y_{ij} = 0$ denote the non-occurrence of "CHE"). Further, let X_{1ij}, through

X_{kij} denote the 'k' level 1 predictor or explanatory variables measured on this household and Z_{1j} denote the level 2 predictor on the j th cluster:

$$\text{logit}\,(P(Y_{ij}=1)) = \alpha_0 + \alpha_1 X_{1ij} + \ldots + \alpha_k X_{kij} + \beta_1 Z_{1j} + \alpha_{0j} \quad \ldots\ldots\ldots (1)$$

where $\alpha_{0j} \sim N(0,\tau^2)$. We employ two multilevel binary logistic regression models in the analysis. Model I is the intercept only or the empty model and, in the Model II, we incorporate the household level and district level characteristics (state) in addition to the district level random effects. The expected probabilities are estimated by exponentiation of the regression coefficients (odd ratios).

Discussion of Results

Following the specifications outlined in the methodology section, the resulting regression coefficients are reported in Table 2.

Table 2: Coefficient Estimates and Standard Errors for Two-Level Model of Incidence of Catastrophic Health Expenditure (CHE)

Description	Model I (Empty Model)	Model II (With Predictors)
Model intercept	-2.435** (0.043)	-5.852** (0.187)
Household member covered under PM-JAY or state insurance scheme (Yes)		0.152** (0.041)
No coverage [R]		
Govt/Public hospital used		5.523** (0.095)
Private/Charitable hospital used		7.457** (0.088)
Both Govt and Private hospital used		7.145** (0.113)
No hospitalisation [R]		
No ration card		0.019 (0.128)
Antyodaya Anna Yojana		-0.043 (0.121)
Below Poverty Line		0.117 (0.148)
Above Poverty Line		0.196 (0.138)
Priority Household		0.123 (0.117)
State Food Security Scheme		0.223* (0.108)
Others [R]		
Rural		0.136** (0.049)
Urban [R]		
Not Reported		0.086 (0.269)
Scheduled Tribe (ST)		-0.0255 (0.104)
Scheduled Caste (SC)		-0.079 (0.049)
Other Backward Classes (OBC)		0.028 (0.039)
Others [R]		
Variance of District-level random intercepts	0.131** (0.022)	0.339** (0.057)

Note: Standard errors are in parentheses; ** denotes significance at 1% level, * denotes significance at 5% level; [R] denotes reference category. Estimates for coefficients of the variable *State* are reported separately in Table 3.

The intercept-only multilevel logistic regression (Model I) estimates that approximately 8.1% of Indian households experience CHE, with significant variation observed across districts. This means that in an average district, with all predictors at their baseline levels, about 8 out of every 100 households are expected to incur CHE. The geographic heterogeneity as indicated by variance of District-level random intercepts indicates that district-level contextual factors such as healthcare infrastructure, program implementation, and socioeconomic conditions importantly shape CHE risk. Such variation justifies the use of a multilevel modelling approach.

Model II, which incorporates key predictors such as health insurance coverage, hospitalization, socioeconomic status, social identity, and geographic factors, reaffirmed meaningful district-level clustering in CHE risk. Contrary to expectations, enrolment in publicly funded health insurance schemes including Ayushman Bharat was associated with a 16.4% increase in the odds of experiencing CHE. This finding likely reflects increased healthcare utilization among insured households, especially costly inpatient services, which can lead to higher out-of-pocket payments despite insurance coverage. Such

results highlight that insurance enrolment alone does not guarantee financial protection. Hospitalization emerged as the strongest determinant of CHE risk. Notably, private hospital admissions impose a particularly heavy financial burden, with odds of CHE substantially higher in private than government facilities. However, significant CHE persist even in public hospitals, indicating weaknesses in the effective delivery of publicly funded insurance schemes. Households holding Special Food Security Scheme cards are disproportionately affected by CHE, signalling gaps in financial protection for these marginalized populations that must be addressed with targeted subsidies and expanded cashless access. Higher CHE risk among rural households' points to the need for improved rural healthcare infrastructure, expanded insurance penetration, and financial schemes tailored to rural challenges. Lower CHE risk among Scheduled Tribe households may reflect alternative healthcare practices or accessibility challenges. Policies must be inclusive and culturally sensitive to ensure equitable access.

The model accounted for state and union territory effects, recognizing that governance, infrastructure, and socio-economic environments vary widely across India and influence health outcomes. State-level coefficients (presented in Table 3) offer insights into regional heterogeneity, aiding in the tailoring of context-specific policies.

Table 3: State-wise Coefficients and Odds Ratios

State Name	Coefficient	Odds Ratio (OR)
Jammu & Kashmir	-0.153	0.858
Himachal Pradesh	-1.248**	0.287
Punjab	-0.073	0.929
Chandigarh (U.T.)	-0.473**	0.623
Uttarakhand	-0.059	0.943
Haryana	-1.179**	0.308
Delhi	-1.85**	0.157
Rajasthan	-1.126**	0.324
Uttar Pradesh	-0.184	0.832
Bihar	-0.988**	0.372
Sikkim	-0.621**	0.537
Arunachal Pradesh	-2.177**	0.113
Nagaland	-2.243**	0.106
Manipur	-1.69**	0.184
Mizoram	-1.801**	0.165
Tripura	-1.388**	0.25
Meghalaya	-1.175**	0.309
Assam	-0.984**	0.374
West Bengal	-0.866**	0.421
Jharkhand	-0.135	0.874
Odisha	-1.048**	0.351
Chhattisgarh	-0.635**	0.53
Madhya Pradesh	-0.477*	0.621
Gujarat	-0.707**	0.493
Dadra & Nagar Haveli & Daman & Diu	-1.983**	0.138
Maharashtra	-0.447**	0.64
Andhra Pradesh	-0.571*	0.565
Karnataka	-0.166	0.847
Goa	-1.592**	0.204
Lakshadweep (U.T.)	-0.64**	0.527
Kerala	-1.024**	0.359
Tamil Nadu	-0.713**	0.49
Puducherry (U.T.)	-1.922**	0.146
Andaman and Nicobar Islands (U.T.)	-1.56**	0.21
Telangana	-0.738**	0.478

Note: Coefficients represent the effect size on the odds of CHE. ** indicates significance at the 1% level, * indicates significance at the 5% level, and Odds Ratios (OR) less than 1 indicate reduced odds compared to the reference category.

Conclusion and Policy Implications

This study highlights that approximately 8% of Indian households experience CHE, with significant variation across districts, underscoring the importance of addressing regional disparities in health financing. Contrary to expectations, enrolment in publicly funded health insurance schemes such as Ayushman Bharat does not automatically confer financial protection; instead, it is linked to higher CHE risk, largely due to increased utilization of costly hospital services. This reveals that expanding insurance coverage alone is insufficient to mitigate financial risk. Policy efforts must therefore prioritize strengthening cost containment measures, enhancing efficiency in claim processing, and expanding empanelment of quality healthcare providers to ensure effective financial protection. The high CHE burden linked to hospitalizations particularly in private facilities as well as in public hospitals call for robust regulation, pricing transparency, and enforced cashless service delivery across sectors.

Furthermore, targeted interventions are urgently needed to reduce inequities faced by rural populations and vulnerable groups, including households under social security schemes. Addressing geographic and socio-economic heterogeneity through tailored, context-specific policies will be critical in advancing UHC in India and reducing health-induced financial hardship.

Limitations

This study benefits from the rich, nationally representative self-reported data provided by the HCES, which offers valuable insights into household consumption and health expenditures. While the survey does not include detailed information on chronic illness, hospitalization duration, disability status, and sources of healthcare financing, factors that could further enhance the understanding of CHE. The self-reported consumption expenditure data remain a crucial resource for analysing financial risk. The reliance on self-declared information also encourages careful interpretation and highlights opportunities for future research to incorporate more detailed clinical and financing data for deeper analysis.

Note

1. The data was accessed from the official microdata archive of the Ministry of Statistics and Programme Implementation, available at: https://microdata.gov.in/NADA/index.php/catalog/237.
2. To identify households uniquely across levels, the serial number of the sample FSU, second-stage stratum number, and sample household number are combined as a composite household identifier. TJ

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Medical Insurance Policy Features and User Satisfaction: An Analytical Study from Gujarat

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Abstract

This study examines satisfaction and renewal intentions of Medical Insurance policyholders in Gujarat within India's expanding health insurance market. It focuses on key policy attributes—age eligibility and premium range, illness coverage, and medical expense coverage. Using an exploratory-descriptive design and structured questionnaires across Ahmedabad, Rajkot, Surat, and Vadodara, the study identifies major factors shaping satisfaction and renewal behavior. Findings highlight the need for insurers to better align policy features with consumer expectations to enhance retention. The research contributes to understanding health plan choice behavior and offers insights for developing consumer-centric health insurance products in India's evolving healthcare financing landscape.

Keywords

Health Insurance, Medical Insurance, Choice.

Prologue

India's health insurance market is at a turning point, driven by rising costs, COVID-19 awareness, and Ayushman Bharat. Coverage now exceeds 50%, with rural uptake rising through digital outreach. Private insurers are innovating with telemedicine, wellness, and disease-specific plans.

Despite affordability and awareness gaps, growth at 9.1% CAGR signals vast potential for Medical Insurance.

Review of Literature and Research Gaps

The literature highlights recurring factors influencing health insurance purchase decisions in India, including low awareness, cost barriers, policy complexity, and the influence of demographic and behavioural variables. While these studies provide valuable insights, they also expose key gaps—particularly in grassroots awareness strategies, flexible product models, digital literacy, and region-specific behavioural data. The major contributions, findings, and research gaps identified across prior studies are summarized. The summary of earlier research (Table No. 01) further underscores consistent concerns about affordability and the complexity of policy terms, alongside evolving consumer behavior shaped by digital tools and socio-economic contexts.

Table No. 01: Table showing the Summarised Review of the Literature

Author(s)	Year	Key Findings	Research Gap
Kaur & Aggarwal	2022	Awareness is a key barrier, especially in rural and semi-urban areas.	Lacks strategies for improving awareness at grassroots levels.
NITI Aayog	2021	Insurance illiteracy leads to confusion over policy terms, discouraging purchases.	Does not explore how to simplify insurance language for better understanding.
Sengupta & Mukherjee	2020	Income is a major factor; high costs deter buyers.	Need for alternative low-cost models and microinsurance options.
IRDAI	2023	Cost barriers discourage >30% of buyers.	No analysis of premium subsidies or flexible payment models.
Chhabra & Sharma	2021	Trust and claim transparency affect buying decisions.	Limited focus on building long-term consumer trust in digital platforms.
Kotak Institutional Equities	2022	Consumers focus more on benefit-to-cost ratio than on total coverage.	Does not explore how insurers can better communicate value propositions.
Patel et al.	2019	Health experiences increase likelihood of insurance uptake.	Need to explore how such experiences can be used for awareness campaigns.
World Bank	2020	Self-perceived risk drives willingness to pay.	Lacks exploration of how to increase risk awareness among low-risk-perception groups.
Banerjee & Ghosh	2021	Insurance agents drive 60% of sales in smaller cities.	Insufficient data on training and digital integration of agents.
PwC Health Report	2023	Millennials are increasingly influenced by digital tools.	Limited focus on digital literacy in older and rural populations.
Roy & Sinha	2022	Ayushman Bharat improved awareness but caused confusion with private plans.	Need to study how to clearly differentiate public vs. private schemes for users.
Rajan et al.	2020	Demographic factors influence insurance buying intent.	No behavioral or psychological factors explored.

Author(s)	Year	Key Findings	Research Gap
KPMG Report	2021	Gender gap narrowing in decision-making.	Lacks in-depth gender-based behavior analysis across different regions.
EY India	2023	Claims ease is a top concern for customers.	Does not propose structural improvements to claims handling mechanisms.
Rao & Kumar	2019	Buying behavior impacts satisfaction levels.	Limited to one city; lacks broader geographical or cultural context.
Yadav & Sudhakar	2018	Socioeconomic factors significantly influence decisions.	Needs a longitudinal approach to track changes in influencing factors.
Tirukoti	2015	Quick hospital access and cost concerns dominate decision-making.	Focused on one region; lacks generalizability to national level.
Thomas & Moli	2013	Education, income, and awareness are key differentiators.	Does not explore interventions to improve these differentiators.
Aiyar et al.	2013	Suggested periodic BPL list updates for better targeting.	Lacks analysis on technology-enabled identification mechanisms.
Verma et al.	2013	Recommended cross-subsidy to promote access and equity.	Does not test practical implementation models for cross-subsidization.
Lavanya	2012	Age, education, and income impact willingness to pay.	Does not explore impact of financial literacy programs.
Vellakkal	2012	Advocated for community-friendly plans for low-income groups.	No pilot models or real-world implementations discussed.
Dholakia	2010	Urged insurers to design user-centric, affordable products.	Needs research on consumer input in product co-creation.
Bhat & Jain	2006	Income, healthcare spending, and awareness drive demand.	Outdated—requires validation in current economic context.
Groenewegen et al.	2005	Consumer choice enhances quality and cost control.	Does not evaluate such choices in regulated markets like India.
Ranson	2003	Community-based schemes in demand but poorly inclusive.	Needs updated insights on performance post-Ayushman Bharat.
Studdert et al.	2002	Price, provider choice, and care usage affect decisions.	Requires contemporary evidence with localized focus in India.

Source: Constructed by Researcher on the basis of Review of Literature

However, many studies lack regional focus, overlook behavioral dimensions, or fail to translate findings into practical strategies for insurers and policymakers. Building on these gaps, the present study focuses on Medical Insurnace policyholders in Gujarat, examining how policy attributes such as age eligibility, premium range, illness coverage, and treatment-related expenses influence satisfaction and renewal intent. An overview of the key research gaps serving as the foundation for this study is presented in Table No. 02.

Table No. 02: Table showing the Key Research Gaps

Sr. No.	Type of Research Gap (Miles, 2017)	Description	Identified in Literature / Relevance to Current Study
01.	Evidence Gap	Lack of sufficient or updated empirical evidence.	Bhat & Jain (2006), Ranson (2003), Studdert et al. (2002) – Outdated; need updated insights post Ayushman Bharat. Roy & Sinha (2022) – Confusion between schemes needs better usage data. Current Study: Provides updated empirical data for contemporary context.
02.	Knowledge Gap	Gaps in conceptual understanding or why/how outcomes occur.	NITI Aayog (2021), Kaur & Aggarwal (2022) – Confusion over insurance terms. World Bank (2020) – Lack of insight into improving risk perception. Patel et al. (2019) – Behavior patterns unexplored. Current Study: Explores behavioral and psychological drivers.
03.	Methodological Gap	Limitations in research design, sample size, or scope.	Rao & Kumar (2019), Tirukoti (2015) – Region-specific, lacks generalizability. Yadav & Sudhakar (2018) – Cross-sectional, no temporal analysis. Current Study: Employs broader, stratified sampling for wider relevance.
04.	Theoretical Gap	Lack of application of theoretical models or frameworks.	Verma et al. (2013), Thomas & Moli (2013) – Absence of theoretical integration. Dholakia (2010), Chhabra & Sharma (2021) – Lacks connection to behavior theories. Current Study: Uses Health Belief Model, Consumer Decision-Making Model.
05.	Practical-Application Gap	Failure to translate research into actionable outcomes.	EY India (2023), Lavanya (2012) – Identify problems but don't propose solutions. PwC (2023), Banerjee & Ghosh (2021) – Lack of strategies for digital/agent integration. Current Study: Recommends actionable policies for insurers and policymakers.

Source: Constructed by Researcher on the basis of Review of Literature

By addressing evidence, methodological, and practical gaps, this research contributes both academic value and policy relevance, offering insights for insurers and regulators to design more consumer-centric health insurance products.

Purpose of the Study

This study profiles Medical Insurance policyholders in Gujarat, examining how demographic factors (age, marital status, income, family structure) relate to key policy features (age eligibility, premium range, illness and expense coverage). It further assesses how these attributes influence renewal decisions, aiming to guide more effective product design and marketing strategies in health insurance.

Basic Terms of the Research Study

Health Insurance: Financial protection against high medical costs through pooled risk and premium-based coverage (WHO, 2023; Bhattacharya et al., 2014).

Medical Insurance: Private health insurance reimbursing hospitalization and domiciliary care; offered as individual, family, group, or overseas plans (Gumber, 2002).

Choice: The decision-making process involving evaluation and uncertainty when selecting among alternatives (Hansen, 1972).

Methodology Overview and Variable Classification for Data Analysis

This section provides an overview of the analytical framework, highlighting the variables and statistical techniques employed to interpret the collected data. A tabular overview of the methodology and classification of variables used in the study is provided below for reference.

Table No. 2.1: Research Framework for Analyzing Key Evaluation Criteria

Sr.No.	Component	Details			
01.	Objective	To assess respondents' perceived importance and satisfaction for three key criteria in relation to demographic variables.			
02.	Key Criteria Analyzed	1. Age Eligibility and Premium Range 2. Coverage of Illness and Diseases 3. Coverage of Other Medical and Treatment-related Expenses			
03.	Target Group	Medical Health Insurance Policyholders across selected cities in Gujarat			
04.	Demographic Variables and Abbreviations Used	**Code**	**Variable**	**Code**	**Variable**
		GEN	Gender	TF	Type of Family
		EDU	Education	AI	Annual Income
		MS	Marital Status	NDFM	No. of Dependent Family Members
		OCC	Occupation	NEFM	No. of Earning Family Members
05.	Analytical Method Used	Chi-Square Test and Structural Equation Modelling			
06.	Output	Data collected from 1,463 respondents Findings and their implications derived based on statistical significance			

Reliability and Validity of the Research Study

Reliability and validity were tested using Cronbach's Alpha, with values across 11 factor groups ranging from 0.671 to 0.894, indicating acceptable to high internal consistency (Malhotra, 2007; Table No. 3).

Table No. 3: Overview of Indicators and Their Reliability (Cronbach's Alpha) Scores

Sr. No.	Selected Criteria	Cronbach's Alpha Coefficient
01	Experiences on Medical Insurance Policy for Age Eligibility Conditions (Q-11)	**0.750**
02	Experiences on Medical Insurance Policy for Ranse of Premium (Q-11)	**0.696**
03	Experiences on Medical Insurance Policy for Coveraae of Illness and Diseases (Q-11)	**0.756**
04	Experiences on Medical Insurance Policy for Coyeraae of Medical and other Expenses (Q-11)	**0.862**

Table No. 4: Comparison of Average Scores for Key Factors Affecting Medical Insurance Policy Purchase Across Four Selected Cities in Gujarat

Respondents' Opinion with respect to Criteria		Respondents' Opinion with respect to Criteria		Difference in Mean Count (Column 2 -Column 4)
Rating Scale 1 (Highly Dissatisfied) to 5 (Highly Satisfied)				
(Q-11-1 to Q-11-67)	Mean Score (Rank)	(Q-12-1 to Q-12-11)	Mean Score (Rank)	
1	2	3	4	5
Age Eligibility Conditions	3.54	Age Eligibility Conditions	3.56	-0.02
Range of Premium	3.49	Range of Premium	3.56	-0.07
Coverage of the Illness Diseases	3.24	Coverage of the Illness Diseases	3.63	-0.39
Other Coverage related to the Treatment and Medical Expenses	**4.01**	Other Coveraee related to the Treatment and Medical Expenses	**3.54**	0.47

Table 4 demonstrates convergent validity, as the question categories displayed minimal variation and reflected consistent average satisfaction levels, with responses spanning from highly unsatisfied to highly satisfied.

Analysis and Interpretation of Findings

The collected data has been analyzed by the researchers, and the main findings are outlined below:

Respondents' Demographics: Most Medical Insurance policyholders in Gujarat were aged 18–44, with less than 10% above 54 due to age limits. Males (60%) and married individuals (70%) dominated, while 55% were salaried. Although 92% were familiar with insurance terms, awareness of specific schemes was low—only 13% recognized standalone health insurance, revealing critical knowledge gaps.

Table No. 5: Selected Medical Insurance Policyholders' Overall Awareness on the Terms of Medical Insurance Policy

Sr. No.	Selected Terms of Medical Insurance	Number and Percentages of Medical Insurance Policyholders (In Number and %)	Sr. No.	Selected Terms of Medical Insurance	Number and Percentages of Medical Insurance Policyholders (In Number and %)
1	Health Insurance Policy	1057 (72.2)	21	Critical Illness	605 (41.4)
2	Mediclaim Policy	1369 (93.6)	22	Cashless System	985 (67.3)
3	Individual Mediclaim Policy	980 (67.0)	23	Cash Reimbursement System	594 (40.6)
4	Floater Mediclaim Policy	523 (35.7)	24	Renewal Age Limit	737 (50.4)
5	Premium	1278 (87.4)	25	Renewal Discounts	770 (52.6)
6	Sum Assured	1225 (83.7)	26	Claim Free Years	733 (50.1)
7	Sum Insured	630 (43.1)	27	Filline of the Claims	519 (35.5)
8	Pre-hospitalization	526 (36.0)	28	Succession Certificate	567 (38.8)
9	Nursina Expenses	1014 (69.3)	29	Claim Settlement	658 (45.0)
10	Room Boarding Expenses	1155 (78.9)	30	Health Insurance Portability	413 (28.2)
11	Domiciliary	424 (29.0)	31	Sub Limits on the Medical Expenses	471 (32.2)
12	Post-hospitalization	609 (41.6)	32	Non-Life Insurance Company	447 (30.6)
13	Comprehensive Network Base	616 (42.1)	33	IRDA	649 (44.4)
14	Pre-existing Illness	682 (46.6)	34	Central Government Health Insurance	417 (28.5)
15	Waiting Period	581 (39.7)	35	Employees' State Health Insurance	508 (34.7)
16	Waiver	287 (19.6)	36	Private Health Insurance	322 (22.0)
17	Deductibles	291 (19.9)	37	Community-based Health Insurance	237 (16.2)
18	Exclusions	274 (18.7)	38	Universal Health Insurance	236 (16.1)
19	TPAs	535 (36.6)	39	Standalone Health Insurance Scheme	185 (12.6)
20	Co-Payment	347 (23.5)			

Evaluation of Hypotheses Using Chi-Square Method

The Chi-Square test was applied to examine the association between demographic factors and policyholders' perceptions and satisfaction levels toward various Medical Insurance features. As these variables were categorical in nature, the test appropriately identified significant group-wise differences in line with the research framework and objectives of the study. *Note: In Tables 6 to 11, bold values indicate statistically significant relationships (S), while non-bold values indicate non-significance (NS).*

Hypothesis 1: The perceived importance of Age Eligibility and Premium Range among selected medical insurance policyholders was found to be independent of their background variables, including age. gender, education, marital status, occupation, type of family, annual income, number of dependent family members, and number of earning family members.

Perceptions of age eligibility and premium range varied significantly by age, education, marital status, earning members, and income, while gender, occupation, and dependents showed no significant influence (Table 6).

Table No. 6: Chi-square Analysis of Perceived Importance of Age Eligibility and Premium Range vs. Background Variables

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDU DF=12	MS DF=12	OCC DF=16	TF DF=04	AI DF=36	NDFM DF=12	NEFM DF=12
Age Eligibility and Range of Premium										
01	Age eligibility for Purchase of the Policy	**(.021)**	(.862)	(.949)	**(.019)**	(.331)	(.196)	**(.004)**	(.211)	(.058)
02	Broad range of the Age eligibility for die Renewal of die Policy	(.556)	(.189)	(.173)	(.057)	(.553)	(.051)	(.544)	(.536)	(.231)
03	Range of the premium offered by the companies	(.188)	(.284)	(.578)	(.442)	(.251)	**(.040)**	**(.004)**	(.161)	(.635)
04	The range of the premium for the various age groups for purchase of policv	(.081)	(.063)	**(.001)**	(.458)	(.943)	(.068)	**(.018)**	(.591)	**(.038)**

Hypothesis 2: The perceived importance of Coverage of Illness and Diseases among selected Medical Insurance policyholders is independent of their background variables, including age. gender, education, marital status, occupation, family type, annual income, number of dependents, and earning members.

Table No. 7: Chi-square Analysis of Perceived Importance of Coverage of Illness and Diseases vs. Background Variables

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDU DF=12	MS DF=12	OCC DF=16	TF DF=04	AI DF=36	NDFM DF=12	NEFM DF=12
Coverage of Illness and Diseases										
05	Coverage of the various Illness/Diseases	(.232)	(.285)	(.190)	**(.023)**	(.749)	**(.000)**	(.311)	(.567)	(.341)
06	Coverage for the Allopathic Treatments	(.013)	(.558)	**(.004)**	**(.033)**	(.375)	**(.021)**	**(.032)**	(.263)	**(.037)**

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDU DF=12	MS DF=12	OCC DF=16	TF DF=04	AI DF=36	NDFM DF=12	NEFM DF=12
07	Coverage for the Ayurvedic Treatments	(.783)	(.683)	(.079)	(.248)	(.592)	**(.018)**	(.233)	(.177)	(.115)
08	Coverage for the Naturopathy Treatments	**(.189)**	(.232)	(.950)	(.347)	**(.012)**	(.233)	(.493)	**(.000)**	(.151)
09	Coverage for HIV Infection	(.611)	(.061)	(.203)	(.111)	**(.049)**	**(.002)**	**(.022)**	**(.038)**	(.211)
10	Coverage for Cancer	(.787)	(.435)	**(.021)**	(.266)	(.170)	**(.010)**	**(.016)**	(.053)	(.352)
11	The time period for the inclusion of the Preexisting; Illness	(.449)	(.864)	(.803)	(.561)	**(.009)**	(.516)	(.310)	**(.007)**	(.239)

Perceptions of illness coverage (allopathic, general, cancer, HIV) varied significantly by age, education, marital status, occupation, income, and family structure, while gender showed no significant effect as shown in Table No. 7.

Hypothesis 3: The perceived importance of Coverage of Other Medical and Treatment-Related Expenses among selected Medical Insurance policyholders is independent of their background variables, including age. gender, education, marital status, occupation, family type, annual income, number of dependents, and earning members.

Table 8: Chi-square Analysis of Perceived Importance of Coverage of Other Medical and Treatment-Related Expenses vs. Background Variables

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDIT DF=12	MS DF=12	OCC DF=16	TF DFHM	AI DF=36	NDFM DF=12	NEFM DF=12
Coverage of the Other Medical and Treatment-Related Expenses										
12	Coverage for the Room Boarding Expenses	(.284)	(.889)	(.125)	(.299)	(.199)	(.279)	**(.001)**	(.283)	(.079)
13	Coverage of the Nursing Expenses	**(.003)**	**(.031)**	(.055)	**(.007)**	**(.029)**	(.249)	**(.015)**	(.451)	(.052)
14	Coverage of Pre-hospitalization Expenses	(.099)	(.380)	(.156)	**(.030)**	**(.025)**	(.216)	(.467)	(.200)	(.597)
15	Coverage of Post-hospitalization Expenses	(.632)	(.147)	(.755)	(.116)	**(.019)**	**(.023)**	**(.029)**	**(.011)**	**(.001)**
16	Coverage in the period of loss of income during the hospitalization	(.088)	(.055)	(.428)	(.169)	(.115)	(.154)	(.155)	(.179)	(.363)
17	Domiciliary Hospitalization Cover	(.411)	**(.013)**	(.093)	(.534)	(.312)	(.322)	(.078)	(.877)	(.160)
18	Provision of giving Surgeon, anaesthetist, medical practitioner, consultants, specialist's fee:	(.081)	**(.014)**	(.072)	(.269)	(.356)	(.050)	(.245)	0433)	(.705)

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDIT DF=12	MS DF=12	OCC DF=16	TF DFHM	AI DF=36	NDFM DF=12	NEFM DF=12
19	Coverage of payment of Professional fees related to Anaesthesia/blood/ oxygen/operation/surgical/ appliances/medicines	(.606)	(.222)	(.308)	(.300)	(.341)	(.106)	(.584)	(.642)	(.212)
20	Coverage of expenses related to diagnosis, X-Ravs, expenses for any allopathic curing or diagnosing therapy or expenses for the organs replacements or any other similar spends	(.195)	(.436)	(.288)	(.472)	(.272)	(.108)	(.360)	(.121)	0834)
21	Renewable Discount Offers	(.676)	(.847)	(.097)	(.606)	(.449)	(.147)	(.284)	(.106)	**(.004)**
22	Bonus for the Claim Free Years	(.635)	(.485)	**(.028)**	(.922)	(.724)	(.143)	(.069)	**(.047)**	(.173)
23	Provision for Copayment Discount?	(.400)	(.111)	**(.021)**	(.884)	(.494)	(.086)	(.302)	(.198)	(.474)

Perceptions of Medical Insurance features varied across demographic and socio-economic groups. Age influenced nursing coverage; education shaped views on bonuses and co-payment; gender, marital status, occupation, income, and family structure also affected various expense coverages, while family type showed minimal influence (Table 8).

Hypothesis 4: The satisfaction or dissatisfaction of selected Medical Insurance policyholders regarding Age Eligibility and Premium Range is independent of their background variables, including age, gender, education, marital status, occupation, family type, annual income, number of dependents, and earning members.

Table 9: Chi-square Analysis of Satisfaction with Age Eligibility and Premium Range

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDIT DF=12	MS DF=12	OCC DF=16	TF DFHM	AI DF=36	NDFM DF=12	NEFM DF=12
Age Eligibility and Range of Premium										
01	Age eligibility for Purchase of the Policy	(.424)	(.408)	**(.011)**	(.033)	(.062)	(.394)	**(.009)**	**(.018)**	**(.018)**
02	Broad range of the Age eligibility for the Renewal of the Policy	(.341)	(.403)	(.313)	(.462)	(.033)	(.297)	(.296)	(.893)	**(.005)**
03	Range of the premium offered by the companies	(.130)	(.177)	(.201)	**(.031)**	(.234)	(.323)	**(.017)**	(.217)	(.473)
04	The range of die premium for die various age groups for purchase of policv	(.192)	(.561)	(.229)	**(.039)**	(.162)	**(.038)**	(.058)	(.562)	**(.021)**

Satisfaction with age eligibility and premium range was unaffected by age, gender, or occupation but varied by education, marital status, family type, income, dependents, and earning members (Table 9).

Hypothesis 5: The satisfaction'dissatisfaction of the selected Medical Insurance policyholders for the Coverage of Illness and Diseases criteria vis-a-vis the selected Medical Insurance policyholders' selected background variables—age. gender, educational qualifications, marital status, occupation, type of family, annual income, the number of dependent familv members, and the number of earning family members—is independent.

Table No. 10: Chi-square value of Satisfaction with Coverage of Illness & Diseases criteria

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDU DF=12	MS DF=12	OCC DF=16	TF DF=04	AI DF=36	NDFM DF=12	NEFM DF=12
Coverage of Illness and Diseases										
05	Coverage of the various Illness / Diseases	(.666)	(.584)	**(.005)**	**(.015)**	(.741)	(.172)	(.152)	(.468)	(.102)
06	Coverage for the Allopathic Treatments	(.121)	(.672)	**(.008)**	**(.004)**	(.233)	**(.000)**	(.239)	(.175)	(.273)
07	Coverage for the Ayurvedic Treatments	(.376)	(.657)	(.151)	(.646)	**(.035)**	(.508)	(.264)	(.131)	**(.005)**
08	Coverage for the Naturopathy Treatments	(.831)	(.111)	(.573)	(.253)	**(.018)**	(.174)	(.114)	(.178)	**(.041)**
09	Coverage for HTV Infection	(.785)	(.113)	(.458)	(.135)	(.355)	(.810)	(.471)	(.462)	**(.017)**
10	Coverage for Cancer	(.519)	(.122)	**(.034)**	(.073)	(.082)	(.749)	(.068)	(.258)	**(.005)**
11	The time-period for the inclusion of the Pre-existing Illness	**(.020)**	(.138)	(.797)	(.344)	(.305)	(.755)	(.154)	(.118)	**(.039)**

Satisfaction with illness coverage was shaped by age, family type, education, marital status, and occupation, while gender, income, dependents, and earning members showed no significant influenceas shown in Table 10.

Hypothesis 6: The satisfaction dissatisfaction of the selected Medical Insurance policyholders for the verage of the Other Medical and Treatment-Related Expenses criteria vis-a-vis the selected Medical Insurance policyholders' selected background variables—age, gender, educational qualifications- marital status, occupation, type of family, annual income, the number of dependent family members, and the number of eamins family members—is independent.

Table No. 11: Chi-square value of Satisfaction with Coverage of the Other Medical and Treatment-Related Expenses v/s Background Variables

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDU DF=12	MS DF=12	OCC DF=16	TF DF=04	AI DF=36	XDFM DF=12	NEFM DF=12
Coverage of the Other Medical and Treatment-Related Expenses										
12	Coverage for the Room Boarding Expenses	**(.009)**	(.451)	(.066)	(320)	(.271)	(.852	(.130)	(.497)	(.285)
13	Coverage of the Nursins Expenses	**(.044)**	(.554)	(.341)	**(.008)**	(.157)	(.262)	(.442)	(.228)	(.620)

Sr. No.	Selected Criteria	'P' Value of X^2								
		Age DF=20	GEN DF=04	EDU DF=12	MS DF=12	OCC DF=16	TF DF=04	AI DF=36	XDFM DF=12	NEFM DF=12
14	Coverage of Pre-hospitalization Expenses	(.104)	(.124)	**(.004)**	**(.028)**	**(.012)**	(.367)	**(.021)**	(.252)	(.160)
15	Coverage of Post-hospitalization Expenses	**(.024)**	(.437)	**(.027)**	**(.039)**	(.154)	(.282)	**(.030)**	(.391)	(.542)
16	Coverage in the period of loss of income during the hospitalization	(.660)	(.930)	(.947)	(.000)	(.004)	(.981)	(.311)	**(.004)**	(.117)
17	Domiciliary Hospitalization Cover	(.915)	(.656)	(.692)	(.139)	(.229)	(.J)90)	(.054)	(0.112)	**(.003)**
18	Provision of giving Surgeon, anaesthetist, medical practitioner. consultants, specialist's fees	(.124)	(.718)	(.578)	(.061)	(.051)	(.738)	(.338)	(.746)	(.246)
19	Coverage of payment of Professional fees related to Anaesthesia[1] blood[1] oxygen/ operation' surgical appliances / medicines	(.107)	(.244)	(.113)	(.130)	(.268)	(.189)	(.491)	(.286)	(.431)
20	Coverage of expenses related to diagnosis, X-Rays, expenses for any allopathic curing or diagnosing therapy or expenses for the organs replacements or any other similar spends	(.122)	(.273)	(.005)	(.339)	**(.014)**	(.924)	(.474)	(.139)	(.578)
21	Renewable Discount Offers	(.474)	(.414)	(.460)	**(.009)**	(.175)	(.625)	(.284)	**(.009)**	**(.035)**
22	Bonus for the Claim Free Years	(.223)	(.391)	(.310)	(.148)	(.081)	(.884)	(.069)	(.507)	(.095)
23	Provision for Copayment Discounts	(.118)	(.597)	(.161)	(.227)	(.173)	(.595)	(.302)	**(.006)**	**(.000)**

Satisfaction with medical and treatment-related expenses was influenced by age, education, marital status, occupation, income, dependents, and earning members, while gender and family type showed no significant effect (Table 11).

Application of Structural Equation Model

The Structural Equation Modelling (SEM) technique was employed to analyze the causal relationships among key selected medical insurance policy attributes and renewal intentions. SEM was suitable for this study as it enabled the simultaneous examination of multiple interrelated constructs, ensured measurement validity, and quantified the variance explained in renewal behavior, thereby validating the proposed conceptual framework.

Figure 1 shows how Medical Insurance attributes affect renewal intentions. Results show that age eligibility, renewal age range, and premium range moderately influence renewal, explaining 8% of the variance.

Figure No. 1: Structural Equation Model (SEM) illustrating the impact of Age Eligibility and Premium Range criteria on Medical Insurance policyholders' intention to continue renewing their policies.

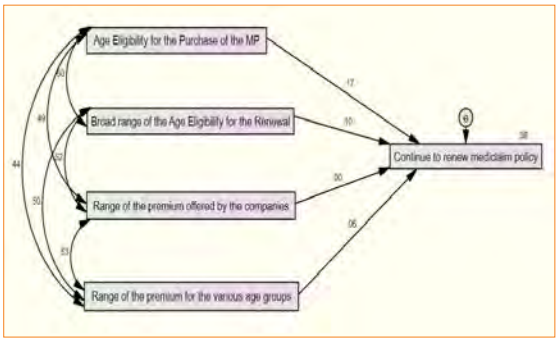

Figure No. 2: SEM depicting the relationship between Coverage of Illness and Disease criteria and Medical Insurance policyholders' intention to renew their policy.

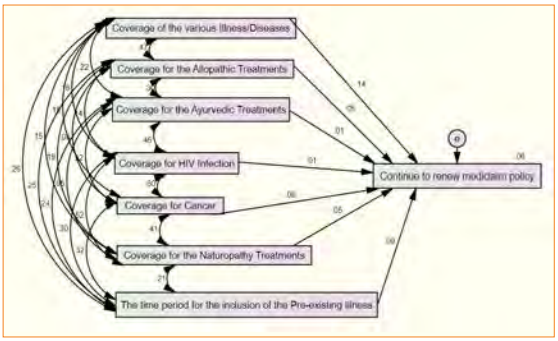

Figure 2 shows that renewal intentions are mainly influenced by illness/disease coverage, inclusion of pre-existing illnesses, and cancer coverage, with smaller effects from allopathic and naturopathy treatments. The model explains 6% of the variance.

Figure No. 3: SEM illustrating the link between Coverage of Other Medical and Treatment-Related Expenses and Medical Insurance policyholders' intention to renew their policy

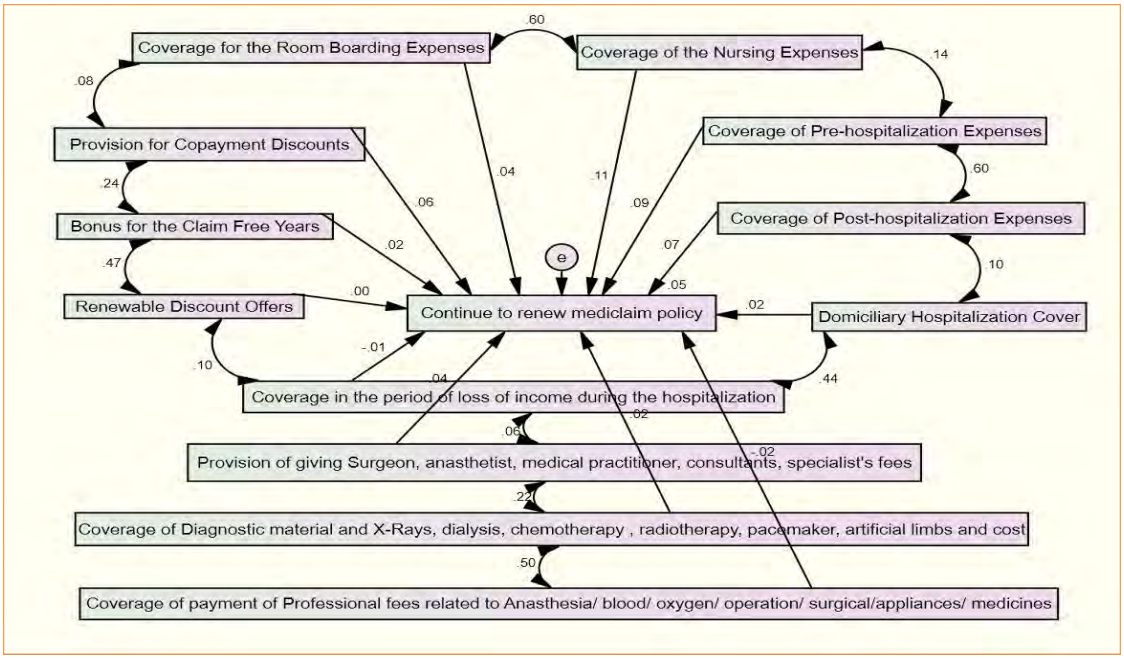

Figure 3 shows that nursing, pre- and post-hospitalization expenses, co-payment discounts, and room boarding are the strongest predictors of renewal, though they explain only 5% of variance. Figure 4 indicates that broader factors—coverage of other expenses (0.20) and age eligibility/premium (0.16)—have the greatest impact, together explaining 10% of renewal intentions, while illness coverage has minimal effect.

Figure No. 4: SEM showing how selected factors influence policyholders' renewal intentions

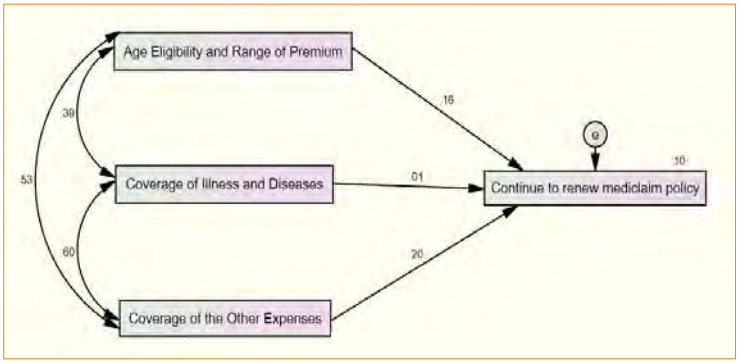

Table No. 12 summarizes the SEM results (Figures 1–4), showing that renewal intentions are modestly explained (5–10% variance) by key policy attributes. Age eligibility and premium range, expense-related features (nursing and hospitalization costs), and coverage of other expenses emerged as stronger predictors, while illness coverage showed limited influence.

Table No. 12.: Summary of Structural Equation Modeling (SEM) Results on Medical Insurance Renewal Intentions

Figure No.	Kev Predictors of Renewal Intention	% Variance Explained (R^2)	Observations
Fig. 1	Age eligibility for purchase (0.17), broad renewal age range (0.10). premium range by age group (0.06)	**8%**	Renewal intentions moderately influenced by age eligibility and premium structure.
Fig. 2	Illness/disease coverage (0.14). inclusion of pre-existing illnesses (0.09). cancer coverage (O.OS), allopathic & naturopathy (0.05)	6%	Coverage of illnesses and pre-existing conditions are main drivers.
Fig. 3	Nursing expenses (0.11). pre-hospitalization (0.09), post-hospitalization (0.07), co-payment discounts (0.06). room boarding (0.04)	5%	Expense-related features show limited but notable influence.
Fig. 4	Coverage of other expenses (0.20), age eligibility & premium (0.16). illness coverage (0.01)	**10%**	Other expenses and premium age factors dominate: illness coverage has minimal impact.

Key Implications of the Research Study

This research provides validated insights and implications drawn from the findings of Chi-Square hypothesis testing.

Marketing Implications:

- The findings suggest that insurance companies should continue designing Medical Insurance plans with age-based premium structures. Additionally, plan features must be tailored to incorporate demographic variables such as marital status and annual family income, which significantly influence the perceived value of Medical Insurance policies.
- The upper and lower premium limits within a given Medical Insurance policy should be customized in alignment with the annual family income of the policyholders to enhance affordability and relevance.
- Health insurance providers are encouraged to adopt rational messaging strategies in their promotional communications, especially in relation to premium structures.
- The study reaffirms the limited preference and perceived value for Ayurvedic treatment coverage, indicating that insurers may continue offering it as a basic, low-cost feature.
- Insurance plans offering coverage for allopathic treatments should

be customized according to key demographic factors including age, education, marital status, family type, annual family income, and the number of earning members in a household.

- While a core structure of Medical Insurance policies may remain consistent, insurers should consider minor modifications that reflect the influence of specific demographic variables to increase policyholder relevance and satisfaction.
- Restrictions related to age eligibility and premium affordability are especially significant for policyholders with varying annual incomes and multiple earning members. A higher number of dependent family members, particularly elderly dependents, increases the financial burden due to higher premiums and limited renewal age ranges. Insurers are advised to develop innovative, age-sensitive packages to address these constraints.
- Post-hospitalization coverage should be made more specific and targeted based on demographic factors such as occupation, family type, family income, and family composition, as the need for such coverage can vary across these dimensions.
- The study highlights the influential role of family members and reference groups in shaping the satisfaction or dissatisfaction of Medical Insurance policyholders. Insurance companies should leverage this by building and promoting their corporate goodwill to enhance trust and adoption.
- In designing renewal discount offers, marketers should account for marital status and family composition, including both dependent and earning family members. Given that family structure and financial conditions can evolve annually, this will ensure more adaptive and relevant Medical Insurance offerings.

Policy Implications:

- The Insurance Regulatory and Development Authority (IRDA) should introduce a separate clause addressing occupational illnesses, facilitating the integration of customized policy features based on the number of dependent family members, particularly in the context of pre-existing illness coverage.
- With the advent of health insurance portability, careful regulation of pre-existing illness clauses is essential to prevent frequent policy-switching, thereby maintaining stability and continuity in Medical Insurance coverage.

Social Implications:

- For serious health conditions such as HIV infection and cancer, insurance companies should develop tailored Medical Insurance plans based on the number of earning family members, given the high risk of catastrophic health expenditures.
- Marital and occupational status were found to influence policyholder experiences during periods of income loss due to hospitalization. Hence, insurers should consider incorporating income loss coverage as a core social benefit in Medical Insurance products, contributing to broader societal well-being.

Concluding Remarks

The study evaluates satisfaction and renewal intentions of Medical Insurance policyholders in Gujarat, finding that demographic factors (age, income, marital status, family structure) strongly influence perceptions and satisfaction. Coverage of treatment-related expenses emerged as the strongest predictor of renewal. The research calls for flexible, income-sensitive products, regulatory revisions (pre-existing illness, occupational coverage, portability), and broader social benefits such as income loss protection. Overall, it provides both academic contribution and practical guidance to strengthen India's Medical Insurance ecosystem and advance universal health coverage.

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From Claims to Care and Choice: Leveraging AI and Behavioural Design to Transform Health Insurance in Rural India

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Abstract

This paper explores how artificial intelligence (AI) and behavioural design are transforming health insurance delivery and uptake in rural India. With insurance penetration in India at just 3.7% of GDP—far below the global average—Tier 2–4 regions remain vastly underinsured. The paper analyses how AI enables personalized underwriting, predictive care, and fraud detection, while behavioural strategies—such as gamification, vernacular interfaces, and nudges—boost awareness and engagement. Drawing from case studies of Pradhan Mantri Jan Aarogya Yojana (PM-JAY), Ayushman Bharat Health Account (ABHA), MicroNsure, and private InsurTechs like Artivatic, it presents a model where insurance shifts from a reactive claims process to a proactive care and choice-driven service. Key findings highlight the importance of integrating AI with culturally sensitive design and supportive policy frameworks. The study concludes that reaching India's next 500 million insured citizens requires a synergistic approach that combines smart technology, human-centered design, and grassroots trust-building.

Keywords

Health Insurance, AI, Behavioural Design, InsurTech, Rural India, Gamification, Policy.

Introduction

India stands at a crossroads in health insurance – traditional, claims-driven models are insufficient to cover its vast rural and semi-urban population. Insurance penetration in India remains very low (about 3.7% of GDP) and lags far behind the global average (≈7.0%). This gap is most acute in Tier-2 and Tier-3 towns and rural areas, where awareness, accessibility and trust are limited. The Government of India and regulators have set ambitious goals – *"Insurance for All by 2047"* – and launched initiatives (Insurance Regulatory and Development Authority of India(IRDAI) Bima Sugam, Vahak, and Vistaar) to boost reach in villages. But beyond policy, a deeper transformation is needed. Advances in AI/ML and behavioral science offer a way to turn insurance from a reactive **"claims"** product into proactive **"care"** and **"choice"** service. By harnessing data-driven personalization, predictive risk profiling, and user-centric design (gamification, nudges, vernacular interfaces), insurers can tailor products to individual needs and motivate healthy behaviors. In this model, **AI tailors and automates**, while **behavioral design educates and engages**. The result is smarter, more inclusive insurance that resonates in Rural India.

The Current Landscape: Insurance in Rural Rural India

India's health insurance landscape is rapidly evolving but remains fragile. Government schemes like Ayushman Rural India – Pradhan Mantri Jan Arogya Yojana (PM-JAY) now cover over **500 million** low-income Indians with ₹5 lakh/year family cover, yet about 600 million remain uninsured or underinsured. Private insurance plays a smaller role: only ~37% of Indians had any

health cover by 2023. Coverage is especially thin in rural areas (less than 25% of rural residents have any health insurance). Key challenges include low digital literacy, sparse healthcare infrastructure, outdated socio-economic data, and fragmented distribution channels. Nonetheless, smartphone and internet adoption are surging even in villages. India now has over 750 million smartphone users, and government schemes like Digital India and PM-JAY are pushing Unified Payment Interface (UPI) and know Your Customer (eKYC) everywhere. These enablers set the stage for tech-driven solutions that meet Rural India's specific needs.

Personalization and AI-Driven Underwriting

At the core of transformation is **AI-powered personalization**. Modern insurers use predictive analytics and vast socio-economic data to tailor products to customer segments. As Deloitte India's Debashish Banerjee notes, "AI and big data help…create better targeted insurance products for specific customer cohorts," enabling insurers to suggest contextual products (e.g. travel insurance when a user plans a flight). Startups like MicroNsure exemplify this approach: they offer usage-based pricing and behavior-linked premiums (e.g. a ₹1 lakh cover for only ₹30/year by targeting low-risk groups). Insurers are also tapping India's digital data infrastructure – Account Aggregators, Health Claim Exchanges, Aadhaar, etc. – to perform precise need-gap analyses. This lets advisors and automated systems "touch base with customers more frequently with contextual and personalized insights".

In practice, AI-driven underwriting and product design involve real-time risk scoring and automated policy configuration. Platforms like Artivatic's intelligent underwriting engines allow insurers to evaluate health and lifestyle signals instantly – from gym attendance to diet patterns – often without manual forms. Wearable data and health apps feed into these models. For example, video-based AI health tools can assess vital signs remotely within seconds, drastically reducing the need for lengthy medical tests. The effect is dual: customers get more affordable, relevant plans, and insurers gain high-quality risk insights. Indeed, AI's power to hyper-segment customers ("not just by age/region but by *what they eat, how they travel, even what they read*") promises insurance that truly fits each Rural Indiaian's profile. In sum, AI turns one-size-fits-all products into a spectrum of micro-products aligned to lifestyles, enabling **choice** at a personalized level.

Proactive Care through Data and Wellness Tracking

Moving beyond personalization, AI enables **preventive health and wellness integration** – turning insurance into health *care*. Insurers are shifting to reward healthy behavior and early detection. Wearables, fitness apps, and health trackers are key. Many Indian insurers now offer discount schemes: for example, ICICI Lombard provides renewal premium discounts for policyholders who log more steps on their fitness tracker. ManipalCigna assigns wellness coaches and health plans to high-risk customers, rewarding improvements with premium rebates. These "wellness programs" treat insurance as a continuous engagement, not a one-time sale.

Recent IRDAI regulations even encourage such innovations: exposure drafts now explicitly allow wellness benefits (e.g. fitness point schemes, health-check vouchers) so long as they're transparently disclosed. Several real-world programs illustrate this trend. For instance, ICICI Lombard's **#DoTheDifficult** program lets customers earn points by running marathons, gymming, or completing health assessments – each point convertible into health services credit. Aditya Birla Health's **AB Multiply** plan gives cashback on buying a smartwatch and ties in e-commerce and ride-sharing rewards (BigBasket, Amazon, Uber, etc.) for healthy purchases. Such incentive systems gamify wellness: every time a rural or urban user does something healthy, they see immediate value. This bridges the gap from *claiming against illness* to *preventing illness in the first place*.

Behind these programs, AI tracks vast health data flows. Milliman's 2020 survey found insurers were already mining smartphone and wearable data on steps, sleep, and heart rate. This "real-time data" enables dynamic underwriting and personalized interventions. For example, AI models can flag early warning signs (spikes in blood sugar trends, sedentary lifestyle, etc.) and trigger messages or coach contacts. Nikhil Kurhe of Finarkein notes a future frontier: insurers moving beyond static medical tests to "lifestyle-based analytics," using variables like diet and travel patterns

as long-term health predictors. In effect, policyholders become active agents in their coverage: if they adopt healthier habits, they earn tangible benefits (lower premiums, perks, or no-claim bonuses).

In parallel, digital health initiatives strengthen this ecosystem. The Ayushman Rural India Digital Health Mission has created **568 million ABHA (health) IDs** by March 2024, linking over 350 million health records. Such a digital backbone means insurers can integrate with telemedicine platforms and government health data to better tailor preventive care. For example, community health workers use AI-powered portable diagnostics (like retinal scanners detecting diabetes) and feed results into insurance-linked preventive check-ups. These interventions – AI-supported screenings at village clinics – not only catch diseases early but also build trust in both healthcare and insurance services.

Smart Claims and Fraud Detection with AI

Even as we build toward care, AI is revolutionizing the back end "claims" process. Traditional claims – with their paperwork, delays, and misuse – are burdensome for rural customers. AI automates and streamlines this. National schemes like PM-JAY already embed AI analytics to accelerate claims adjudication and flag fraud. For instance, algorithms scan billing patterns to catch inflated hospital charges or duplicate claims before payouts are made. Deloitte highlights "agentic AI" for claims: vision systems that examine accident photos to immediately approve minor motor claims. Similar tools can verify hospitalization claims via document scans, OCR, and voice bots.

Private insurers are also catching up. AI-driven platforms can process most claims in days, even hours. As MicroNsure reports, their claim automation engine settles the vast majority of claims within **48 hours**, notifying customers through WhatsApp or IVR in local languages. This zero-paperwork model reduces the usual paperwork delays that frustrated rural customers. Faster claims build credibility: Shriram Life, for example, settled 50% of its rural claims within 12 hours, helped by digital filing and vernacular support.

Moreover, AI heightens fraud vigilance. Artivatic.ai's **FWA Intelligence Platform** shows how: it detects anomalies in real time via behavioral analytics, provider profiling and billing-pattern analysis. Duplicate-claim detection and provider "abuse scoring" keep payouts honest, while clearing legitimate ones faster. Given that fraud and corruption erode rural trust, AI's role here is crucial. By transparently reducing fraud, AI can boost confidence among both customers and regulators (who can see cleaner data).

Through AI, the claims system becomes proactive. For example, insurers might use chatbots and voicebots to nudge patients toward cashless hospitalizations when eligible, avoiding out-of-pocket costs. McKinsey notes how simple script changes (a kind of "nudge") made German motor-claims customers 30% more likely to accept cheaper repair options. In health, similar nudges (like digital reminders of no-claim bonuses or wellness check-ups) can improve claim acceptances and satisfaction. In essence, AI refines every step of claims – from intake to audit – cutting costs and delays. This efficiency feeds back into offering lower premiums and better care, closing the loop of ***Claims to Care***.

Gamification and Behavioral Design: Driving Engagement

Beyond technology, **behavioural design** is pivotal to make insurance appealing and understandable, especially in rural contexts. Insurers now embed gamification, incentives, and nudges into their user experience. Gamification makes insurance "fun and rewarding." For example, insurers add game-like challenges (e.g. fitness contests, quizzes on coverage knowledge), rewards points, and progress tracking to their mobile apps. A Times of India tech blog highlights that gamified insurance apps, with point-based rewards for healthy activities (walking, filling health forms, etc.), increase customer loyalty and retention. Gamification demystifies insurance and builds trust: when customers earn points, redeemable against premiums or health services, they feel actively involved. Over time, "loyalty programmes with point-based rewards" have shown real lift; Bain research notes that a mere 5% boost in retention (often aided by engagement) can lift profits by 25–30%.

Language and culture are key design factors in Rural India. Providing vernacular interfaces is a breakthrough. Many insurers

now support voice or text chatbots in Hindi and regional languages. For example, MicroNsure's mobile platform includes *"vernacular voice support, multilingual chatbots, and assisted onboarding via SHGs and local networks"*. These features break literacy barriers, making policy terms and claims processes understandable for rural users. The Financial Express reports that enabling rural clients to interact in local languages has "broken many barriers". Simple voicebots (via phone) or WhatsApp messages in regional tongues can guide a user through enrollment or renewal step by step. In practice, insured farmers might get an SMS in Hindi or Tamil explaining claim procedures or access an IVR helpline in Marathi. This lowers friction and builds comfort – crucial for adoption.

Behavioral **nudges** also play a role. Subtle design tweaks guide better decisions without removing choice. For instance, digital forms can default to cashless hospitalizations or allow opt-out rather than opt-in (increasing enrollment). McKinsey highlights that nudging often boosts sales and healthy behaviors. In health insurance, a nudge might be sending a timely reminder to schedule an annual check-up or bundling it with a small incentive. Even phrasing matters: a claim advisor using empathetic language may double acceptance of recommended cashless repair options. In India's context, simple nudges – like community health camps that also inform about insurance or using social proof (trust local SHG leader endorsements) – can multiply impact. Essentially, human-centered design leverages cultural insights to gently guide people toward enrollment and policy maintenance, making the insurance journey both intuitive and rewarding.

Innovations and Case Studies in Rural India

Many Indian innovators illustrate these concepts.

- **Government Schemes as Laboratories:** PM-JAY (Ayushman Rural India) is a flagship case. Launched in 2018, it leverages Aadhaar and AI to serve the poor. It covers ~500M people with real-time claims adjudication. The National Health Authority uses analytics to detect fraud (e.g. inflated hospital bills) and to plan infrastructure via geospatial data. This tech-driven public model, despite challenges, provides a **blueprint** for scale. For instance, the digital issuance of *ABHA IDs* (Health IDs) – 568M created by Mar 2024 – lays a foundation for integrating government health data with insurance (e.g., subsidized policies using one's medical history with consent).
- **InsurTech Startups:** Urban and rural-focused startups are emerging. MicroNsure (Tier-2/3 focus) sells personal accident and health covers via cooperative banks and SHGs, using sachet-sized premiums and vernacular onboarding. Its *I2U2* plan, for 140M+ migrant workers, bundles accident and hospital cover with wallet-sized payments and app-based service. Digit Insurance, another tech-savvy player, uses AI in claims (chatbots, triage) to clear motor claims via photos, and sells mostly through digital channels. Artivatic.ai has built AI layers (video-health, fraud analytics) that insurers like SBI Life and Max use behind the scenes. These innovations show Indian companies tackling inclusion with tech.
- **Embedded and Micro Insurance:** Players are embedding insurance in daily transactions. For example, gig platforms (Swiggy, Zomato) now automatically enroll delivery workers into accident cover. Similar models are under discussion for farmers and gig workers, leveraging their digital footprints. The idea of **micro-insurance** is also gaining traction: very low-premium covers for health events, sold through agricultural input sellers or mobile recharge vendors, are piloted to reach low-income Rural India. These products rely on AI to price risk even for individuals lacking formal records.
- **Vernacular and Grassroots Initiatives:** Several state and cooperative efforts tailor insurance culturally. For instance, Odisha's *Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)* workers get subsidized health and accident riders via mobile apps. NGOs and self-help groups often educate members about government health benefits using local dialects and imagery. While data on all these is scattered, the common thread is pairing tech platforms with deep local networks – a strategy Deloitte calls **"agentic AI + human ecosystem"**.

These cases underscore a shift: insurers are not just selling policies, but orchestrating ecosystems. AI provides the backbone for new products and processes, while behavioral design (gamified incentives, vernacular chatbots, microlearning content) ensures these offerings actually resonate with Rural India's users.

Policy, Regulation, and the Role of Governance

Policy and regulatory support are critical to accelerate this transformation. IRDAI and the government have recognized that innovation must be nurtured. The *Bima Trinity* initiatives (Sugam, Vahak, Vistaar) specifically target Tier 3–6 and rural outreach. An "Insurance for All by 2047" commitment frames long-term focus. Regulators are also modernizing: in 2025 IRDAI overhauled its regulatory sandbox, making it easier for InsurTechs and cross-sector solutions to be tested under guidance. Meanwhile, health and finance missions – Digital Health Mission (ABHA IDs), Jan Dhan Yojana (banking for the poor), Aadhaar, UPI, and PM-JAY – create a digital ecosystem that insurers can plug into. For example, a student with an ABHA ID could seamlessly get a wellness discount by sharing fitness app data (with consent), or a farmer could pay a micro-insurance premium via UPI on his feature phone.

Tax and financial inclusion policies also help. Section 80D income tax rebates encourage buying health insurance, and new guidelines permit insurers to pay out claims via immediate transfer to linked bank accounts (BHIM/UPI). Moreover, government distribution channels (post offices, Jan Aushadhi stores, health sub-centers) are increasingly used to educate and enroll citizens in insurance programs. To align incentives, regulators emphasize fair terms: IRDAI mandates simple language, no discrimination in wellness programs, and robust grievance redressal to build trust.

Taken together, India's policy landscape increasingly **influences behavior**: it lowers entry barriers (digitally and regulatory), offers data frameworks (Account Aggregator policy), and even experiments with nudges itself (random audits replaced with behavior insights in some welfare schemes). Insurers that engage with these policy tools – for instance, by listing micro-products on the Bima Sugam portal or designing products compliant with sandbox regulations – can expand faster. Notably, regulatory eyes are turning to customer outcomes: the next wave will likely see mandates on AI governance and ethical algorithm use in insurance to ensure that innovations also protect Rural India's vulnerable.

Overcoming Rural Barriers: Trust, Literacy, Infrastructure

Applying AI and behavioral design in rural Rural India is not without hurdles. Limited internet connectivity, low smartphone penetration in remote areas, and distrust of digital platforms persist. Outdated data (the 2011 SECC census, for instance) can mis-target subsidies. Many rural consumers remain "unfamiliar and uncomfortable with digital tools," as Deloitte observes. Also, entrenched brokers and middlemen can mislead villages with misinformation.

However, solutions exist in tandem with the very innovations outlined above. Hybrid models leverage human intermediaries: *Swasthya Mitras* (health ambassadors) use tablets to capture data and assist villagers through AI-driven clinics. Claim assistants or trained agents in kiosks help those without smartphones. Voicebots allow feature-phone users to interact by speaking, bypassing literacy barriers. Insurance literacy is boosted through small video tutorials and community workshops (sometimes gamified quizzes), building familiarity. Crucially, AI can target education as well: nudges (SMS reminders, incoming call IVR prompts) can be timed around cultural calendars (e.g., reminders after harvest season to renew crop or health cover).

Trust is fostered by transparency and social proof. Quick claim pay-outs (often instant through UPI) show rural customers that the product works. Successful community pilots – for example, a village group that used wearable-tracking to jointly lower premiums – can be publicized as a case story. Some insurers even hold "insurance melas" (fairs) in local hubs, using folk media or street plays to explain concepts in local dialects. In effect, behavioral design in India is as much about understanding culture and context as about screens and buttons. The best solutions will blend AI's efficiency with human empathy: one CEO notes "AI can do a lot, but trust is built face-to-face". Empowering village agents and community champions ensures the technology reaches hearts as well as hands.

The Road Ahead: The Next 500 Million Policyholders

India's next frontier is clear: the **next 500 million insured lives will come from Rural India, not the metros**. Reaching them requires both **intelligent systems and human-centered design**. On one hand, AI enables insurers to innovate faster than ever – launching tailor-made micro-policies in days, automating renewals, and continuously learning from data. The future may bring even more cutting-edge tools: agentic AI that autonomously negotiates claim settlements, generative AI chatbots fluent in dozens of dialects, and predictive models that integrate genomics or social determinants of health.

On the other hand, we must never lose sight of the user's perspective. Behavioral science will guide how these new products are packaged and delivered: simple user interfaces, culturally resonant messages, and incentive structures that respect choice. For example, insurers might embed coverage in everyday apps (e-wallets, agri-marketplaces) with a one-click opt-in, while using real-time nudges (e.g. "Your annual health check is due – schedule now to earn ₹200 credit!"). Gamified community challenges (villages competing in aggregate wellness scores) could become common. Crucially, the design principle is empathy: products should be created *with* Rural India's people, not merely *for* them.

In this vision, insurance becomes a **service** rather than a one-off product. Policyholders participate in a health ecosystem where their data (securely managed) flows into predictive care, and where positive behaviors are rewarded. The system offers them choices: between covers, between treatment options, between engaging in prevention or paying out-of-pocket. Such empowerment is the ultimate goal – to transform insurance from a contract to a partnership. MicroNsure's mantra captures it: "Let's make insurance a right, not a privilege".

Finally, the socio-economic impact is profound. When rural India is truly insured – when even a poor farmer or migrant worker knows that a hospitalization won't wipe out the family – health shocks will cause less poverty and more stability. Early detection of disease (via AI-driven campaigns) will save lives and costs. Digital tools will integrate health insurance with banking, ration cards, and education, weaving it into the fabric of rural life.

This is not a distant dream. The tech and behavioral innovations already exist; the task is to weave them together under a policy and ecosystem that cares for the whole human. As insurers and policymakers collaborate – guided by data, creativity, and empathy – Rural India's millions will gradually shift from viewing insurance as a bureaucratic claim slip, to seeing it as a pathway to health, security, and choice. TJ

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The Role of Insurance in Promoting Financial Inclusion, Advancing Social Equity, and Strengthening Risk Resilience

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Abstract

Insurance is critical in addressing financial inclusion, delivering social equity, and enhancing systems for preventing risks in contemporary economies. Although traditionally considered a financial safeguarding tool, insurance has taken on the position of a strategic tool, leading to the reduction of economic gaps within a population, addressing vulnerabilities, and supporting inclusive development. The paper will examine the theoretical rationale of insurance as the provider of equity of access to financial services, paying attention to its ability to act as a guardian of disadvantaged groups, and support against adverse shocks. The paper relies on available literature sources, articles, and documents and outlines the solutions that appeared innovative in the field of insurance, the involvement of technology, and a respectful attitude to the regulatory system, helping in reaching these targets. It also looks at the issues and the bottlenecks that restrict insurance penetration among the underserved groups and gives recommendations of fore policies that can be adopted in the future to ensure the inclusivity of insurance systems.

Keywords

Insurance, Financial Inclusion, Social Equity, Risk Prevention, Risk Resilience.

Introduction

India, with its vast population and diverse socioeconomic landscape, grapples with numerous challenges related to financial insecurity and social exclusion. Millions of households are exposed to various risks such as health emergencies, natural disasters, crop failures, and income volatility, which can push them deeper into poverty. Furthermore, marginalised communities, including women, rural populations, and informal workers, often face barriers in accessing formal financial services, exacerbating their vulnerability.

Insurance has been traditionally viewed as a contractual relationship

that would give an entity financial compensation following a loss, damage or any other contingency (Mbodj & Laye, 2025). Nevertheless, modern changes within the realms of economic policy, technology, and social welfare have caused a shift that has turned insurance into a many-dimensional tool with extensive connotations. The world is witnessing a high rate of urbanisation in the emerging economies, a high rate of entrepreneurship and a high exposure rate to the effects of climate change, financial volatility, as well as health catastrophes.

Defining the Concepts: Insurance Penetration and Insurance Density

The insurance penetration is one of the best indicators that show how much the insurance industry contributes to the economy of a nation. It is an expression of the total insurance premiums compared with the Gross Domestic Product (GDP) of a country, usually in the form of percentages. This measure shows the degree to which insurance services have been incorporated into the economic system of a nation. An increase in the insurance penetration means that insurance is more important in the economy as it shows more awareness, availability and application of insurance products by both individuals and businesses. Economically developed countries tend to have a higher insurance penetration due to financial literacy, higher income per capita and a well-developed insurance market. Developing economies, on the contrary, have lower penetration rates because their outreach is limited, there is no awareness, and there is no sufficient regulatory infrastructure. Insurance penetration is, therefore, a necessary indicator that politicians and regulators can use to determine the maturity and performance of the insurance industry, besides developing plans to increase insurance coverage and enhance financial inclusion.

Insurance density is the average amount paid as premiums per individual in a particular country within a certain period of time, usually a year. It is calculated as a sum of the insurance premiums collected divided by the total population and is expressed in monetary terms. The level of insurance density indicates the level of insurance and awareness among citizens. An increase in the insurance density means that people tend to buy more insurance products, demonstrating more knowledge about risk insurance and monetary safety. The indicator is especially beneficial in the comparison of the development of insurance markets in countries with different populations. Insurance penetration is used to identify the role played by the industry in the economy, but insurance density seeks to identify the extent to which people are investing in insurance.

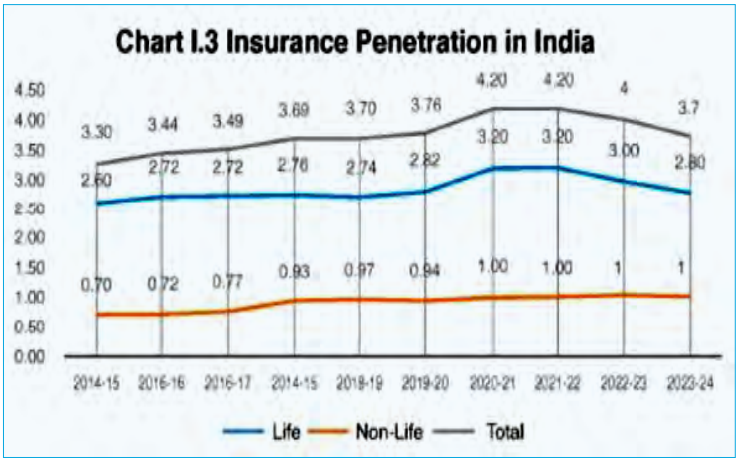

Table:1

Source: Swiss Re, Sigma World Insurance Report, various issues
(Penetration - in per cent)

The chart depicts the trend of insurance penetration in India from 2014–15 to 2023–24. Life insurance penetration remained in the range of 2.6% to 3.2%, reaching its peak in 2020–21 before declining to 2.8% in 2023–24. Non-life insurance penetration rose gradually from 0.7% in 2014–15 to 1% in 2020–21 and has stayed constant since then. Consequently, the total insurance penetration increased from 3.3% in 2014–15 to its highest level of 4.2% in 2020–21 and 2021–22, but fell to 3.7% in 2023–24. This trend

indicates that while awareness and uptake of insurance improved over the years—especially during the pandemic—there has been a slight decline recently, highlighting the need for renewed efforts to sustain growth in coverage.

Insurance as a Driver of Financial and Social Inclusion

Financial inclusion is the act of making available, and hence accessible to everyone, regardless of the underfunded, convenient financial products and services, e.g., savings, credit options, payment systems, and insurance (Ahluwalia & Khurana, 2025). Financial inclusion can be defined as the mechanism of ensuring access to financial services and hassle-free and adequate credit to the vulnerable citizens, including the weaker sections and the low-income group, at an affordable price. It is multi-dimensional and includes:

Access: Availability of financial services in a certain region.

Usage: Frequency and utilisation of services.

Quality: appropriateness and relevance of financial products to the needs of customers.

Insurance is also part and parcel of this ecosystem, given that it has helped cement one critical gap: risks that can potentially derail economic participation between Insurance and Financial Inclusion. Savings and credit can be achieved by channelling funds through the banking system; however, it does not automatically mean that one is safe (Manduca, 2025). Insurance supplements such services by offering a cushion that ensures the household does not regress into poverty with regard to shocks.

Dimensions of financial inclusion

Figure:1

Source: Rangarajan committee report

Insurance as a Tool for Advancing Social Equity

The principle of social equity implies that everyone should be provided with the resources, opportunities and protections fairly and justly. Insurance as an inclusive design and implementation is an effective equaliser in societies characterised by inequalities. It makes sure that marginalised and at-risk groups such as low-income households, women, rural communities, and workers in the informal sector are provided equal access to risk protection, as are the more privileged populations. Traditionally, insurance advantage has been skewed to people of higher income since it is inaccessible in terms of its affordability, awareness, and due to geographic inaccessibility (OLAIYA et al., 2023). But there are now specific measures which have opened this gap, like microinsurance, community-based insurance, as well as a government-subsidised premium model. As an example, health microinsurance schemes in developing countries have provided affordable cover towards medical costs, allowing the poor subjects to obtain medical care without being lured into the poverty trap (Hussain et al., 2021).

An insurance policy is also dangerous in eliminating structural obstacles. Insurance products that are gender sensitive, such as those addressing caregivers, female entrepreneurs and

those working in the agricultural sector, can help. Insured financial products could help women to take property, livelihoods, investments in business and decision-making in societies where culture has traditionally locked women out of owning property and the risk of insecurity. Moreover, social equity is promoted in case insurance is integrated with the larger welfare schemes. Governments can develop a full safety net by connecting insurance coverage with social protection schemes so that not only are the vulnerable individuals safeguarded, but also empowered. As another example, crop insurance tied to agricultural extension activities has the potential to mitigate climate-based risks to smallholder farmers and enhance their productivity and ability to earn an income.

Coverage under Government Flagship Personal Accident Schemes

Scheme	No. of persons covered (lakh)	Gross Premium (₹ crore)
IRCTC	3,734.70	11.67
PMJDY	1,874.75	5.65
PMSBY	3,400.06	685.13
Total	**9,009.51**	**702.45**

Table:2

Source: IRDA Annual Report 2023-24.

Over 900 million people are covered under flagship personal accident schemes like IRCTC (Indian Railway Catering and Tourism Corporation). Here are the full forms: PMJDY(Pradhan Mantri Jan Dhan Yojana) and PMSBY(Pradhan Mantri Suraksha Bima Yojana). By embedding insurance into everyday platforms and offering it at nominal premiums, these schemes break access barriers, protect vulnerable groups, and promote financial equity—ensuring that accident risk does not push low-income families into poverty. Social equity also involves the importance of ensuring that there is equity in sharing the resources, opportunities, and privileges in society. Insurance promotes social equity because it equalises the competitive field- they make sure the souls of the underprivileged, the downtrodden class, have access to the protection that was accessible only to the richer cit cohort (Meera et al., 2016b). This is more so in aspects like health, agriculture, and housing, where socio-economic inequality is compounded by risk inequity and inequalities in protection (Mbodj & Laye, 2025).

Strengthening Risk Resilience through Insurance Mechanisms

Insurance is one of the most important aspects in the contemporary socio-economic environment, acting not only as a financial security tool but also as a potent mechanism in inclusive growth and resilience. At its simplest, insurance protects against financial shocks by pooling risk among individuals and businesses so that it can promote stability in an uncertain world.

Risk prevention helps in augmenting the capacity of insurance to be proactive rather than reactive. As an example, insurance companies can reward safe practices with lower insurance rates, stimulate protective health check-ups, and stimulate disaster-proof building practices (El-Nahal, 2022). By so doing, the insurance masks dysfunctional design as a passive financial product and becomes an active participant in modifying the incidence and severity of risks. Without risk management mechanisms, populations with low income may be at risk of financial shocks hindering development. In this respect, insurance provides a safety that is not mere protection against catastrophe but allows for planning and investing long-term.

Insurance as a Catalyst for Risk Resilience

Risk resilience is the ability of people, communities and systems to experience, absorb, adapt and recover to a negative shock- be it

economic, environmental orhealth-relatedd (Anusha, 2020b). Resilience, as one of the areas of concern that go hand-in-hand with managing the impacts of climate change, pandemics, geopolitical tensions, and economic instability, has become the subject of intense policy-making as well as commercial and household concerns in an era where volatility is the new normal. Insurance becomes one of the foundation stones of this resilience-building (Didenko & Sidelnyk, 2021).

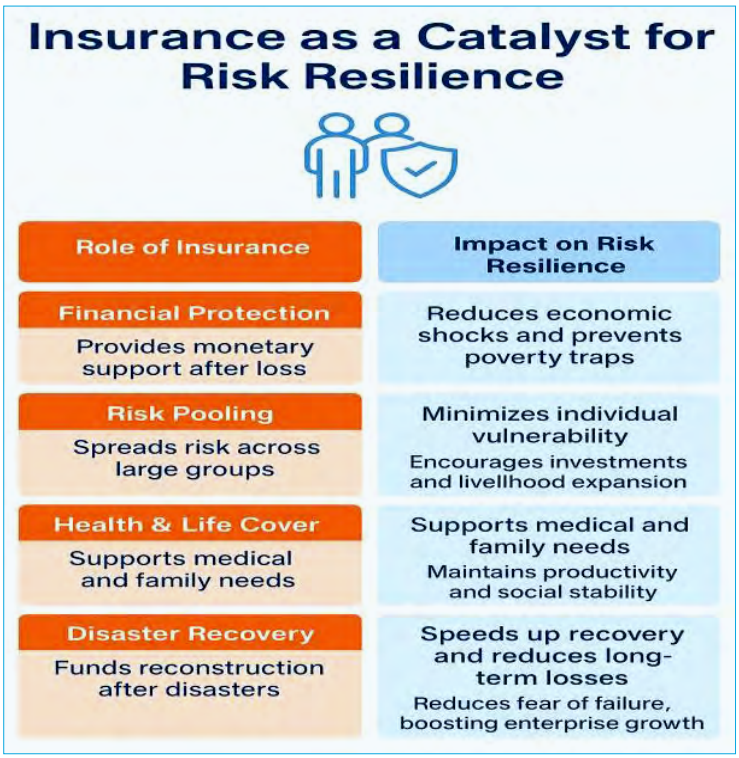

Figure:2

Source: Author's own work.

To begin with, insurance guarantees liquidity of finances after a disaster or other misfortune. To provide an example, parametric insurance models enable communities to receive money without going through any long claims processes and having to continually prove the event is worthy of benefit provision.. Insurance, through this, does not simply respond to risks but participates in proactive resilience strategies. Insurance enhances systemic resilience through pooling risks at a regional and population level (Bhandari, 2018).

Also, the insurance role in risk resilience can be found in the area of psychological security. It helps to ensure that people and societies are free of stress and uncertainty, as financial backing will be available when they are in need. Such mental strength usually goes unnoticed and is part of general stability in society.

RISK PREVENTION

Prevention over Compensation – Shifting from reactive loss coverage to proactive risk reduction through disaster readiness, safety awareness, early warning systems, and technologies like IoT, AI, and telematics for real-time monitoring and early interventions.

Incentives for Safer Behaviour – Encouraging policyholders to adopt healthy, sustainable, and risk-conscious habits by offering rewards such as premium discounts for safe driving, wellness practices, and eco-friendly constructions.

Climate & Community Resilience – Supporting climate-proof agriculture, sustainable resource management, and collaborating with governments, NGOs, and communities to improve infrastructure, enforce safety regulations, expand microinsurance, and protect vulnerable groups.

Barriers to Achieving Comprehensive Financial and Social Inclusion

Some of the challenges in expanding social security benefits include a lack of funding to support universal social security systems, poor governance issues with the institutions currently tasked with providing social benefits, low state spending, heterogeneity among the majority of the workforce in the unorganized sector, which makes it difficult to adopt a simple and uniform system across the workforce and

occupations, inappropriate pricing of the risk in the insurance sector due to a lack of the necessary data/ information for actuarial pricing of the premium, which leads to associated moral hazard and adverse selection issues (Francis et al., 2025). The government steps in to provide financial support in the form of premium contributions towards these schemes in order to facilitate the provision of insurance for the weaker sections of the population, as risk-adjusted premium rates are frequently higher and unaffordable for them(Ichim, 2020). Access to financial services is also hampered by issues with supply and distribution, as well as demand and customers (Taylor, 2016).

The main obstacles from the demand side include social isolation, low literacy, particularly financial literacy, among the general public, and ignorance of financial services and products. The primary obstacle on the supply side is the high perceived transaction costs for providers, such as banks and insurers.

- **Financial Literacy and Limited Socio-Cultural Considerations-** Ignorance regarding the insurance products, coupled with cultural or religious beliefs, e.g., depending on fate, has a great implication in their participation. Uptake is also deterred by negative experiences in the past with insurers.
- **Regulatory and Relationship Barriers -** Differential lack of relevance in insurance across jurisdictions breeds complexity and restricts innovation and disincentivises the entry of insurers into the low-income markets. Trust also goes away where there is weak consumer protection legislation or an unfavourable execution.
- **Issues on affordability and Sustainability -** Some population groups are at high risk, but the insurers may find it unprofitable to offer their products at low prices. Without subsidies and reinsurance, they find it hard to maintain such offerings.
- **Infrastructure and Accessibility gaps -** The system could not reach underserved areas due to the absence of digital connection, adequate banking infrastructure and channels and inadequate distribution points.
- **Trust Deficit and market Misconduct -** delay in processing those who have made claims, mis-selling the Policies, and lack of transparency discredit the process of making trust less painful; otherwise, it is difficult to get inclusive insurance coverage.

Revamp Regulatory Architecture

The insurance sector plays a critical role in advancing financial inclusion, but complex regulations, slow claim processes, and limited outreach have often hindered its effectiveness. To address these challenges, the regulatory framework has been

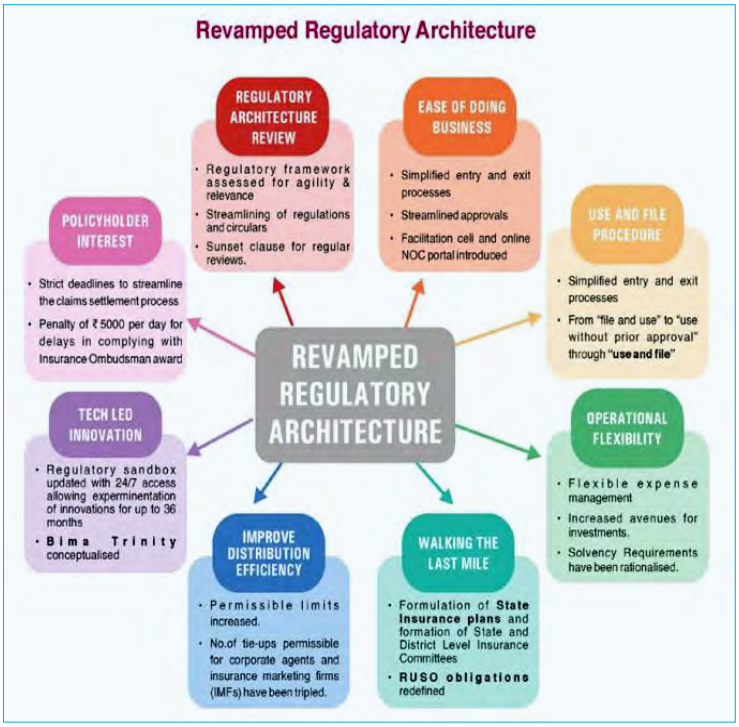

Figure:3

Source: IRDA Annual Report 2023-24.

comprehensively revamped to make it more agile, transparent, and customer-centric.

The revamped regulatory architecture in insurance aims to reduce barriers to financial inclusion by simplifying entry and exit processes, streamlining approvals, and introducing flexible regulations that encourage innovation. Initiatives like tech-led innovations, improved distribution efficiency, and last-mile connectivity through state-level insurance plans make insurance more accessible to underserved communities. Stricter measures to protect policyholder interests and faster claim settlements build trust, while rationalised solvency requirements and expanded tie-up limits enable wider outreach. Together, these reforms create a more agile, inclusive, and customer-friendly insurance ecosystem, ensuring greater coverage for vulnerable and remote populations. Overall, the revamped regulatory architecture is a transformative step towards building a more inclusive and efficient insurance ecosystem. By reducing procedural bottlenecks, encouraging innovation, and ensuring stronger policyholder protection, these reforms not only expand insurance penetration but also strengthen trust and accessibility.

Conclusion

To sum up, insurance has the transformative power of changing financial accessibility, introducing social equity, and increasing risk resilience, particularly in a world with growing uncertainty. The insurance not only serves as a refuge to livelihoods but also provides structure to the economically underserved and vulnerable audiences, which leads to access to economic activities and stability. Insurance products can reduce financial gaps when their model is based on inclusivity, and therefore, individuals and communities could resist shocks and remain in poverty without further deteriorating the situation. This inclusivity helps create trust, social cohesion, and a sense of shared responsibility, which are vital aspects in creating equitable societies. Insurance itself acts as a safety net or a preventive measure as far as risks are concerned. In addition to making reparation by replacing what is lost, it can promote the prevention of harms by the utilisation of risk analysis, risk education, and reward precautionary actions. Further accessibility, transparency, and efficiency may be gained by using IoT technologies like digital platforms, artificial intelligence-powered underwriting, and blockchain, and insurance can then become more adapted to emerging risks. By rebranding insurance as the driver of empowerment and stability instead of the passive safety net, both policymakers and industry leaders can make sure that it will turn into the desired driver of sustainable development. The difficulty does not lie in justifying the importance of insurance, but in making its gains felt by all, in all places-turning protection into the common pillar of progress.

Managerial Implications

- Product Innovation to Include: Create affordable, simple and flexible forms of insurance products which appeal to the low-income and underserved population, to touch more of the market and create more social impact.
- Customer-Centric Approach: Leveraging customer insight and behaviour data to be able to develop need-based products and more readily accessible services through communication in local languages and easier to understand.
- Digital Transformation: Use AI, mobile applications, and blockchain to facilitate the issuance of policies, settlement of claims, and the detection of frafraudinimizing the operation costs and building the credibility of customers.
- Capacity Building: Develop, educate employees and third parties in inclusive practices, digital, and ethical selling as a continuation of the quality of the service supply, and customer satisfaction.
- Regulatory Compliance & Innovation Balance: Keep up with the changing regulations and innovate to create products that meet new risks such as cyber threats and climate change.
- Long-Term Resilience Building establishes insurance as a means of promoting social and economic stability so that societies and companies can recover more quickly after being hit with shocks and can achieve long-term growth. TJ

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India's Quest for 'Insurance for All by 2047': A 2025 Perspective

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Abstract

India is one of the fastest growing economy and stands at a critical juncture in its socio-economic development journey. However, despite the economic growth, India's insurance penetration - the ratio of total insurance premiums to the gross domestic product (GDP) - remains significantly low compared to global averages. A high insurance penetration ensures protection against unforeseen events, helping business focus on performance while mitigating operational risks. As per Insurance Regulatory and Development Authority of India (IRDAI) and other industry reports, insurance penetration in India was around 3.7% in 2023, compared to the global average of over 7%. This under-penetration not only reflect missed economic opportunities but also a significant gap in financial resilience. Insurance holds a transformative potential, especially for economically vulnerable populations and can contribute significantly towards economic stability in developing economies like India. Realizing this potential would require all stakeholders to adopt a multi-pronged approach that encompasses education, innovation, regulatory reform, and behavioural change. Bridging the gap between urban and rural penetration and aligning products with the unique needs of Indian consumers is crucial for an inclusive and sustainable growth.

Keywords

Insurance for All by 2047, Parametric Insurance, Smart Contracts, Embedded Insurance, Financial Inclusion.

Introduction

In a bid to find sustainable, scalable and cost-efficient solutions that act as a social security alternative for its citizens, Governments across the globe are finding insurance as an effective tool - that can also address the limitation of traditional state-funded welfare system, while also promoting financial responsibility and risk sharing among the citizens. This has resulted in insurance evolving over the years, from a mere financial service to a vital instrument that supports social welfare and economic development.

Challenges in increasing insurance penetration in India

India too, which has large informal workforce and high dependence on state-funded bailouts during natural disasters and catastrophic events, has embarked on a transformative and ambitious journey in providing Insurance for All by 2047. The vision behind this thought is to ensure that life, health, and property insurance become more accessible, affordable, and equitable for all segments of the society - regardless of income, geography, or social status. However, as of 2025, several challenges impede the realization of this goal, ranging from socio-economic and regulatory factors to technological and behavioural constraints. As we move forward, it would be prudent

to list some of the key concerns that plague insurance sector:

1. **Low financial literacy:** One of the major roadblocks to achieving the objectives a financially secure status in India is poor financial literacy, especially concerning insurance products. Despite increasing awareness about banking and digital payments, especially with JAM trinity i.e. Jan Dhan, Aadhar and Mobile, insurance remains one of the least understood financial instruments in the country. A large portion of the population—particularly in rural areas, low-income households, and informal sectors—lacks basic understanding of what insurance is, how it works, and why it is necessary. Many people associate insurance only with life insurance or view it as a savings product, without grasping the concepts of risk pooling, premium, coverage, exclusions, and claims. Complex and jargonised terms, incorrect advice from peers or local intermediaries, mistrust due to past experiences of mis-selling or delayed claim settlements, further erode policyholder's confidence and result in people often not buying insurance voluntarily, or abandoning policies mid-term.

2. **Coverage and affordability:** India has been a price sensitive market, with customers often measuring insurance costs relative to their income or perceived value. An average Indian household still considers insurance as an unnecessary expense and prefers saving the premium for future goals. The rising economic disparity and an inherent preference for instant returns over long-term security has made the matters further worse for the industry, with stakeholders finding it challenging to increase insurance penetration, especially to uncovered population or low-risk groups. With over 80% of country's workforce employed in the informal sector, fixed periodic premium payments are challenging due to irregular income sources. This affects the pricing of insurance products by the companies as lower participation from low-risk groups or a small/ concentrated risk pool can lead to a less balanced insurance portfolio, potentially driving prices even higher. The more affordable flagship schemes, that offer coverage at low premium, have limited benefit value, thus losing their appeal to all segments of the society.

3. **Bad Customer experiences:** Unlike many other industries, insurance is built heavily on trust and long-term relationships. When customers have negative experiences, whether during the policy purchase, service period, or claims process, the consequences are significant and far-reaching. Although regulations allow policyholders to cancel or return an insurance policy if they discover that the insurer misled them or withheld crucial information, many individuals place blind trust in agents and often neglect to read the full policy document during the "free-look" cancellation period—when they can still exit without financial loss. With more consumers turning to online platforms to purchase or renew insurance policies, complaints about mis-selling and manipulative practices—known as dark patterns in the digital space—have been on the rise. A survey found that 6 out of 10 users of online insurance platforms have reported encountering dark patterns such as nagging, subscription traps, and forced actions. Such tactics compromised customer's ability to make informed choices, potentially leading them to purchase inadequate coverage or get stuck in unwanted subscriptions. At times of need, especially during claims, if policyholders face any difficulties - they are less likely to renew or recommend the insurer to others. These challenges include delays in approvals, denials without clear explanations, or excessive paperwork during claims process, leading to frustration and perceptions of unfairness. The struggle to understand jargonised policy terms, exclusions, and conditions due to technical language and lack of clear communication, often leads to misunderstandings

and dissatisfaction, especially when they realize the loss causing risk event wasn't even covered. Further, a one-size-fits-all approach by insurers, with limited personalization or flexibility in coverage options, leads to disengagement. In all, these factors lead to poor customer experiences, which is a critical factor hurting the industry's growth, contributing to widening trust deficit, low customer retention, and low market penetration.

The challenges to increase insurance penetration are umpteen. However, where there are challenges, there also exists opportunities for growth. To bring uninsured into the fold, all stakeholders will have to come on a common platform to collaborate and explore strategic solutions that address various pain points during the entire insurance journey. These strategies can span across measures for increasing consumer engagement through grassroots-level awareness campaigns, simple product designs, wider distribution reach, building trust, and undertaking comprehensive regulatory reforms.

Emerging opportunities

The country's large and youthful population, expanding middle class, and increasing urbanization has led to a growing demand for diverse insurance products—including life, health, motor, and agricultural insurance. Government initiatives such as Ayushman Bharat -Pradhan Mantri Jan Arogya Yojana (PM-JAY), the Pradhan Mantri Fasal Bima Yojana (PMFBY), and Jan Suraksha schemes (Pradhan Mantri Suraksha Bima Yojana - PMJJBY and Pradhan Mantri Suraksha Bima Yojana - PMSBY) have already laid the groundwork for broader inclusion, particularly for low-income and vulnerable populations. In parallel, digital transformation and financial technologies are reshaping the traditional models of insurance distribution, underwriting, and servicing. The widespread adoption of mobile phones, digital payment platforms like Unified Payment Interface (UPI), and Aadhaar-enabled services has enabled low-cost, scalable customer acquisition and policy servicing. The rise of insurtech startups and digital aggregators is simplifying policy comparison, enhancing transparency, and improving user experience, while reducing transactional costs.

Listed below are few innovative ways that can be leveraged to further accelerate the pace of insurance adoption and increasing insurance penetration in the country:

1. **Parametric solutions:** India is a country vulnerable to climatic shocks and natural disasters. Over two decades, between 2000 and 2019, India faced the third most number of natural disaster events in the world. According to a report by the Centre for Science and Environment, India saw natural disasters nearly every day in the first nine months of 2022. Between 2019 and 2023, the country faced damages worth $56 billion due to weather related disasters. When such events occur, the traditional indemnity-based insurance policies reimburse losses after assessment, often falling short in providing timely and efficient compensation, especially in rural and disaster-prone areas. In this context, parametric insurance—a product that offers pre-agreed pay-outs based on the occurrence of a defined event or parameter—presents a promising alternative. By leveraging technology, real-time data, and simplified claim mechanisms, parametric solutions offer faster relief, transparency, and cost-effectiveness while reducing delays in aid distribution.
The most recent example of Nagaland's Disaster Risk Transfer Parametric Insurance Solution (DRTPS) can act as a learning experience for rest of the country. In 2024, Nagaland brought a multi-year parametric insurance cover to protect its population against excess rainfall leading to floods, landslides and other infrastructure damages to the hilly region. In 2025, an insurance claim of Rs 1.06 crore was paid under the above coverage for beneficiaries impacted by 2024 monsoon season, which otherwise could have strained State's budget, especially earmarked for other purposes, e.g., capacity building or state development. By redirecting a portion of State Disaster Response Fund and

National Disaster Response Fund to finance insurance premium for such cover, States, especially with limited fiscal capacities can tap into newer ways to manage financial consequences arising out of any disaster.

2. **Smart Contracts:** The insurance industry is characterized by extensive paperwork, complex underwriting, and lengthy claim settlement processes. However, digital revolution is transforming how insurance operations are handled these days. Among the most disruptive technologies enabling this change is blockchain, and specifically, smart contracts—self-executing code that automatically enforces contract terms into immutable records of insurance transactions and events once pre-defined conditions are met. They instantly intake and process data from the insurer's systems and relevant third-party sources to accelerate underwriting and claim resolution cycles. E.g., insurance giant AXA in 2017 launched the first smart-contract based automated insurance pay-out scheme under product fizzy. It allowed customers to opt for insurance against flight delays or cancellation. The pricing was dependent on the risk of delay and cancellation that was calculated independently for each flight using a custom pricing algorithm. If the flight was cancelled or delayed by more than 2 hours, an automatic trigger prompted direct pay-out into the insured's bank account – without need for any paperwork or follow-ups. Though the service was scrapped later, but the insurer reaffirmed its commitment by launching such products in future. By embedding trust, transparency, and automation into the core of insurance transactions, smart contracts hold immense promise to improve customer experience, reduce operational costs, and minimize fraud.

3. **Embedded insurance:** In era of digital dominance, customer preferences are driven by demands of convenience, speed and personalisation. A way in which insurance penetration can see an exponential uptick is through embedded insurance. It refers to the integration of insurance products or services into non-insurance platforms or digital ecosystems or financial services that are already used by customers. Essentially, it means offering relevant tailor-made insurance coverage for customer as a bundled offering during sale or engagement of another product or service — without the need for customer having to seek it out separately through separate channels. Embedded insurance is more than just a distribution innovation; it offers a fundamental shift in how consumers perceive and access insurance, providing opportunities to bring millions of uninsured individuals into the insurance fold. E.g., IRCTC has partnered with insurers to offer Travel Insurance at a very low premium (currently at 45 paise) for passengers while booking train tickets online, providing financial assistance in case of accidents or untoward incidents during the journey. Around 37.34 crore people were insured in FY23-24 using this insurance. This is just one of the most common and innovative ways of offering affordable, relevant, and customized insurance to customers when they need it most. As digital platforms become the default channels for commerce and interaction, embedded insurance is poised to become the dominant model of insurance distribution in the years ahead.

Way Forward

India needs a multi-dimensional approach from all stakeholders to increase insurance penetration in the country. This may involve convergence of policy reforms, regulatory flexibility and industry's hunger for innovation and widespread adoption of insurance:

1. **Government-level:** Indian Government has realised the potential insurance has to address gap in plugging gaps in social security programme. India runs the largest health insurance scheme under Ayushman Bharat – PM-JAY for the most vulnerable population of the country, providing them access

to healthcare facilities. Being an agri-dominated country, India is home to the third largest crop insurance scheme in the world under PMFBY. India has also one of the most affordable life and personal accident insurance schemes under PMJJBY and PMSBY, which ensure minimum coverage and maximum outreach opportunity to provide a basic safety net for all citizens. Despite these efforts, the protection gap in India is significantly high. To further the pace of insurance adoption, some other steps that can be taken by policymakers may include:

i. Rationalisation/ reduction of Good and Services Tax (GST) on insurance policies – including property, personal accident, group health insurance, etc, which makes insurance more affordable for common man and help in bridging the overall protection gap

ii. Unlocking capital constraints for insurers, including allowing entry of global players with flexible business environment under FDI (Foreign Direct Investment) rules

iii. Universalizing social security schemes like PM-JAY to increase outreach and address root concern of high out of pocket expenses that push people to poverty

iv. Adopting state-sponsored solutions under State Insurance Plans to increase adoption of insurance solutions like parametric products for building resilience

2. **Regulator-level:** IRDAI is making rapid strides to improve insurance adoption in India. The recent directives to ensure insurance penetration at gross root level under Rural Social Obligations, introduction of simplified 'Consumer Information Sheet' to address concerns about mis-selling and enhance transparency, launch of regulatory sandbox to promote product innovation, adopting use and file mechanism to fast-track launch of newer products etc. reflect the Authority's commitment to making insurance accessible to all segments of the Indian population, with a particular focus on rural and underserved areas. Some other measures that Regulator can take to accelerate the adoption of insurance are:

   i. Launching the much touted Bima trinity project, comprising of Bima Sugam, Bima Vahak and Bima Vistaar - that aims to provide simple and affordable insurance covers to hitherto uncovered population through comprehensive product offering using cost-efficient and easily accessible means

   ii. Fast-track adoption of Risk based Solvency Framework, that helps insurance companies to address capacity gaps and make them more transparent in public disclosure

   iii. Setup insurance innovation fund and research labs to support inclusion initiatives or allow Special Economic Zone like exemptions for establishing insurance innovation hubs on similar lines as IDBRT (Institute for Development and Research in Banking Technology)

   iv. Strengthening alternate grievance redressal framework like Insurance Ombudsman to address policyholders' grievances in speedy and cost-effective manner, thereby reinforcing customer faith and improving overall perception about insurance.

3. **Industry-level:** Insurance industry needs to adopt innovative ways to appeal to the broader audience. Companies are already enhancing visibility on ground by recruitment of field agents and adopting digital means to reach customers in a phygital mode. The industry has committed nearly Rs 750 crore over the next three years to run public awareness campaign with tagline 'Acha Kiya Insurance Liya' and 'Sabse Pehle Life Insurance'. The endeavour should

not be to increase the number of policyholders under the protective net of insurance, but also to ensure meaningful protection for policyholders by assessing the actual needs and vulnerabilities of people and builds trust and long-term relationships that fosters confidence in insurance when they need it the most. Some other ways, which industry can also adopt to supplement the efforts for increasing insurance coverage are:

i. Increasing publicity and marketability of standardised and simplified insurance products like Saral Jeevan Bima, Arogya Sanjeevani etc as easy-to-understand insurance products with uniform coverage to bring the uninsured into insurance fold, while allowing option to customers to opt for personalisation through add-on covers and riders

ii. Designing and launching products for uncovered population of the country like gig workers, street vendors, urban poor and migrant workers etc. to increase the risk pool and unlock economies of scale

iii. Collaborating on common platform like Insurance Information Bureau for data sharing and risk modelling as well as integrating systems with State organisations like Birth and Death Register of Registrar General of India, Vahan portal of Ministry of Road Transport and Highways, National Health Claims Exchange platform under Ayushman Bharat Digital Mission etc. to address the menace of fraud and abuse, plugging gaps and saving innocent policyholders from unnecessary premium hikes.

iv. Collaborating with State Agencies like Gram Panchayats, Government Hospitals, Police etc. for better coordination in delivery of insurance services to public

v. Using regulatory sandboxes for accelerating the pace of innovation in insurance

Conclusion

Insurance is a risk transfer and loss mitigation tool that act as a safety cushion for individuals and families from any financial shocks caused by unforeseen events like illness, accidents, natural disasters, and death. Insurance assumes more significance for citizens of developing countries like India, which does not have a very resilient and robust social security system. The rising healthcare costs and increasing economic uncertainties highlights the urgent need for affordable and accessible insurance coverage. Considering the changing customer preferences that are driving varied insurance needs and factoring the large demographic divide, diverse geography and hitherto uncovered population of the country, the objective of India's vision of achieving Insurance for All is simple and clear - to provide universal insurance coverage to every Indian citizen with an aim to promote financial stability across all sections of society. Every attempt should be made to raise public awareness about life, health and general insurance, combat myths and misinformation around insurance, building trust and highlighting how insurance helps individuals and families during emergencies. The industry's latest mass-level awareness campaigns are aimed at promoting this thought. To supplement the awareness efforts, insurance can be introduced as an elective subject in school curriculum, thereby inculcating habits of financial protection and risk awareness at early age. Not only this, the industry also needs to design inclusive solutions for providing apt insurance coverage to MSME's (Micro, Small and Medium Enterprises) and entrepreneurs. These enterprises typically operate with thin margins and limited access to formal credit, making them vulnerable to shocks/ surprises. Whether it's a fire at a small manufacturing unit, a cyberattack, or supply chain disruption, any sudden and unforeseen loss can lead to long-term economic setbacks. Insurance can help MSMEs bounce back by covering physical damage, business interruption, and liability claims. Diversification across emerging lines like insurance for nuclear risks, cyber risks, aviation

risks etc, will help such sectors to flourish, thereby contributing to the economic prosperity in the country. As the world prepares itself to address climate risks, insurance can play a greater role by adopting ESG (Environmental, Social and Governance) indices in their business operations, including designing products for businesses that encourage greener solutions or incentivising such industries which promote green economy. With the risk environment becomes more volatile, insurance companies as risk managers have a far greater responsibility in evolving insurance from being a reactive financial product to a proactive resilience enabler. Further, increasing insurance penetration is not only a top-down policy challenge; it is also a bottom-up social and cultural one, where people will need to adopt a mature, risk-aware approach with individuals and businesses proactively protecting themselves against potential losses through insurance. Society—including families, communities, educational institutions, civil society, media, and cultural influencers— can play a foundational role in shaping attitudes, behaviours, and decisions that contribute to greater insurance coverage.

To sum it up, achieving the ambitious mission of providing 'Insurance for All' will require strategic interventions to tap into newer opportunities for growth and outreach and making coordinated efforts by government, industry, and various stakeholders, including society at large, to build an inclusive and trust-driven insurance ecosystem by 2047. TJ

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Mental Health and Insurance

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Introduction

Mental Health is an integral part of health; it affects the efficiency and behavior of individuals and is quite common in society. Mental health conditions limit the participation of people in the workforce; these problems are difficult to diagnose but have a huge cost. Despite of Mental Healthcare Act, 2017, anecdotal evidence shows persons with mental health conditions face difficulties in obtaining medical insurance coverage due to their mental illness. So, it is important that policy makers should be encouraged to promote availability of and access to cost-effective treatment of common mental disorders at the primary health care level. Evaluating the risk and designing appropriate insurance products requires a deep understanding of the nature of mental disorders and associated costs.

Through this article we are trying to delve into the challenges that insurer face and their potential solutions. Also, includes the current insurance policies and coverages available in India.

Mental Health Insurance Policies in India: Challenges, Solutions, and Current Coverage

Why Mental Health Insurance Matters

Mental health disorders are a growing public health concern in India. According to recent estimates, 60–70 million people suffer from common and severe mental disorders. The Economic Survey 2023–24 reports a lifetime prevalence of 13.7%, with 10.6% of adults currently affected. The COVID-19 pandemic further exacerbated mental health issues, increasing depressive symptoms by 28% and anxiety disorders by 25% globally.

The economic and social costs are significant: mental disorders contribute nearly 5% of India's total disease burden, and depression alone is projected to become a leading contributor by 2030. Despite these figures, 70–92% of individuals with mental disorders do not receive adequate care, primarily due to stigma, lack of access, and financial barriers. These realities underscore

the urgent need for comprehensive mental health insurance.

Factors contributing to mental disorder

Biological Factors

Internal physical causes that predispose individuals to mental illness:

- **Family history & genetics:** Mental health issues like depression or bipolar disorder often run in families, increasing susceptibility.
- **Brain chemistry & structure:** Imbalances in neurotransmitters or brain injuries can affect mood and behaviour.
- **Early development & hormonal changes:** Prenatal stress, poor nutrition, and life stages such as puberty or menopause can influence mental health.
- **Chronic illnesses:** Long-term conditions like diabetes or autoimmune disorders heighten stress and depression risk.
- **Substance use & toxins:** Excessive alcohol/drug use or exposure to harmful chemicals can trigger or worsen mental disorders.

Psychological Factors

Linked to personality, coping styles, and life experiences:

- **Trauma & abuse:** Childhood emotional, physical, or sexual abuse often leads to anxiety or depression.
- **Loss & grief:** Bereavement or major life changes can trigger mental health challenges.
- **Low self-esteem & poor stress tolerance:** Negative self-image and ineffective coping strategies increase vulnerability.
- **Personality traits:** Perfectionism, impulsiveness, or pessimism elevate risk.
- **Chronic stress & emotional dysregulation:** Prolonged stress and inability to manage emotions contribute to disorders.

Environmental and Social Factors

- **External conditions influencing mental health:**
- **Stressful life events:** Job loss, financial strain, or relationship breakdowns can overwhelm coping capacity.
- **Isolation & lack of support:** Loneliness raises depression risk.
- **Bullying & discrimination:** Persistent unfair treatment damages self-worth and mental stability.
- **Limited access to care:** Delayed treatment worsens conditions.
- **Violence & unsafe environments:** Exposure to conflict or abuse causes lasting trauma.
- **Poor living conditions:** Pollution, noise, and inadequate lighting affect sleep and mood.
- **Socioeconomic challenges:** Poverty and unemployment lead to chronic stress.
- **Social stigma:** Discrimination based on race, gender, or orientation exacerbates mental health struggles.

These factors interact, making mental health disorders complex and costly to treat. Rising cases of Attention-Deficit/Hyperactivity Disorder, bipolar disorder, depression, and anxiety highlight the urgency for robust insurance coverage.

Difficulties for Insurers

For designing any policy, the insurer would like to project the costs and hence decide the premiums to be charged. The claim process is an essential element in designing the policies. The subjective nature of illness makes it difficult for insurers to design the policy. There are various challenges around data privacy, stigma of mental health and variability in diagnosis making the modeling of mental health risk more complex which can lead to adverse selection and loss ratios for insurance companies rising above the targets.

A few of the difficulties with the insurer are discussed below:

- **Risk Assessment and Premium Calculation:** Mental illnesses are

subjective and lack standardized diagnostic markers, making it difficult to predict treatment costs and set premiums. Unlike physical health, mental disorders are difficult to evaluate. We can measure the temperature in case of fever, but it is difficult to measure the level of depression, and hence assessing claims associated with mental illness are also difficult to measure and estimate.

- **Data Limitations:** Insurers rely on historical claims data to project costs, but mental health data in India is scarce and fragmented. This absence of reliable actuarial data complicates underwriting and pricing.
- **Mental Health Stigma**: The impact of stigma can be severe—it often prevents people from seeking treatment, reduces social support, and worsens mental health outcomes. The fear of discrimination from others, such as getting labeled as "weak" or "unstable" because they have depression or anxiety. When individuals internalize these negative beliefs, they lead to feelings of shame, guilt, or reluctance to seek help. There are some policies or systems that disadvantage people with mental health issues, such as lack of access to care or workplace discrimination. All this leads them to hide the mental health issue, which ultimate worsens mental health costs.
- **Low Awareness and Demand**: Insurers follow the pooling principle, such that premium from many individuals is sufficient to pay claims to few individuals, however, due to lack of awareness of mental health insurance the demand for mental health policies is low which discourages insurers from selling these policies.
- **Problem of adverse selection**: Mental health issues are often not disclosed or diagnosed early, making risk assessment difficult, asymmetric information between insurers and consumers increases the risk of loss to insurer. This leads to:
  - High-risk individuals buy more coverage.
  - Low-risk individuals avoiding coverage due to higher premiums.
- **Regulatory Compliance:** MHCA 2017 mandates parity between mental and physical health coverage but implementing this requirement involves operational and financial adjustments that many insurers find challenging.
  - Operational Complexities: Validating claims for mental health treatments is difficult due to reliance on self-reported symptoms and varied treatment protocols. Fraud risk and inconsistent psychiatric language add further complications.
  - Financial Viability: Mental health conditions often require long-term care, including therapy and medication, which increases claim frequency and cost unpredictability—posing profitability concerns for insurers.

Potential Solutions

To overcome these challenges, insurers can adopt various techniques:

- **Standardized Diagnostic Protocols:** Work with mental health professionals to establish clear diagnostic and treatment guidelines, reducing ambiguity in claims assessment.
- **Data-Driven Underwriting:** Leverage AI and predictive analytics to analyze behavioral, demographic, and clinical data. conduct surveys and collaborate with healthcare providers to build robust risk models.
- **Awareness and Education:** Launch campaigns in partnership with government and corporates to destigmatize mental health and

increase demand for coverage. The growing awareness of mental health condition and its risks significantly influences mortality, morbidity, disability, productivity and claims which directly influence pricing, reserving and capital modeling for insurers.

- **Tiered Coverage Models:** Introduce waiting periods, sub-limits, co-pay options, and OPD riders to balance affordability and risk. Offer comprehensive plans for hospitalization and optional add-ons for outpatient therapy.
- **Expert Validation:** Expert opinion can help in validating claims for mental health treatments, and implementing diagnostic tests by the experts in the industry can help in overcoming the problem of operational complexities.
- **Risk Diversification:** Utilize reinsurance and risk-sharing mechanisms to mitigate financial exposure. Provide discounts for participation in wellness programs, counseling sessions, and digital mental health platforms to reduce long-term costs.
- **Analyzing Trends for Better Design:** To understand the overall impact and its sensitivity to company specific insurance products, we can analyze various other factors as below:
  - Conduct surveys to understand disease patterns and causes.
  - Identify high-cost disorders with low frequency for targeted coverage.
  - Track patient visits, diagnoses, and treatment costs to project future claims.
  - Assess severity and likelihood of disorders to prioritize coverage.
  - Use demographic and lifestyle data (education, occupation, social media usage, diet, alcohol consumption, family size) to predict risk.

Current Insurance Policies and Connection with Mental Health

The **Mental Healthcare Act, 2017**, enacted in April 2017 and effective from May 2018, ensures parity between mental and physical illness in health insurance—mandating that every insurer must offer mental health treatment on the same basis as physical illnesses.

The Insurance Regulatory and Development Authority of India (IRDAI) reiterated and enforced this mandate—initially in 2019 and subsequently extended, ultimately mandating compliance by October 31, 2022.

Public Insurance Schemes

Ayushman Bharat PM-JAY, covering up to INR 5 lakh annually for families, includes mental health treatment costs—spanning diagnostic assessments, counseling, and rehabilitation—although its actual reach in mental health remains modest.

Several state schemes such as Arogya Karnataka (Karnataka) and Biju Swasthya Kalyan Yojana (Odisha) also extend mental health coverage.

Schemes like Niramaya and Swavlamban offered support for disabilities including mental illness, though some (like Swavlamban) were discontinued.

Private Insurance Schemes

Recent policy reviews found that, among 235 health-insurance products from 30 companies, only about 37.5% explicitly covered mental illnesses while ~51% did not provide mental-health cover; many policies also continue to exclude attempted self-harm and substance-use disorders.

When coverage exists, it is most often linked to hospitalization (inpatient) packages and may include diagnostics, psychiatric consultations and medications; OPD/therapy cover is less common and frequently available only as an add-on.

Several major insurers (for example Care Health, HDFC ERGO, SBI General, Reliance and Liberty) list mental-health inclusions in certain products, but coverage differs by plans, so naming an insurer doesn't guarantee comprehensive cover across every product.

Implementation of MHCA-2017 obligations has improved access on paper, but real-world coverage and clarity in policy wordings remain inconsistent. Actuaries and health providers will need to collaborate to design affordable, sustainable and comprehensive mental-health benefits."

What's improving in 2025

In 2025, mental health coverage in health insurance has broadened significantly—IRDAI now mandates inclusion of disorders such as depression, anxiety, bipolar disorder, schizophrenia, and OCD on par with physical illnesses. Most comprehensive or higher-tier plans now include inpatient hospitalization and may cover diagnostics and medications. A few premium offerings even advertise expanded benefits or fewer caps - some high-end plans report placing no lifetime limits, while basic plans often still cap mental health benefits at around 30–40% of the sum insured. However, outpatient care - including therapy, counseling, and psychiatric consultations - is still limited, and often only accessible via separate OPD riders. Despite regulatory improvements, actual coverage varies widely across insurers and policies, and lifetime and sub-limits persist in many cases.

Final Thoughts

India has taken substantial legislative steps—via the MHCA 2017 and IRDAI mandates, to normalize mental health as an insurable condition. However, the implementation gap remains a critical hurdle. Many policies still provide limited or no meaningful coverage particularly for long-term outpatient care such as therapy and counseling. Stigma and lack of clarity in policy wordings further restrict utilization.

There's promising progress in 2025 – with expanded coverage and better policy designs – but vigilant scrutiny of policy terms, greater awareness campaigns, and close monitoring of insurer compliance remain essential to ensure mental health care becomes accessible, affordable, and destigmatized. Collaboration between insurers, regulators, and mental health advocates will be key to bridging these gaps. TJ

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Guidelines to the Contributors:

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6. **Tables and Figures:** Diagrams, Tables and Charts cited in the text must be serially numbered and source of the same should be mentioned clearly wherever necessary. All such tables and figures should be titled accurately and all titles should be placed on the top after the number. Example: Table 1: Growth Rate of Insurance Premium in India (1997-2010).

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7. **Sample Size:** No restricted sampling is allowed. Minimum sample size should be 100 and above.

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   - **Reference to a Book:** Author. (Year). *Title of book.* Location: Publisher.

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   - **Reference to a Journal publication:** Author(s). (Year). Title of the article/ paper. *Journal name*, volume (issue), page number(s).

     Example: Smith, L. V. (2000). Referencing articles in APA format. *APA Format Weekly, 34(1),* 4-10.

- **Reference to a Web Source:** Author. (Date published if available; n.d.--no date—if not). Title of article. *Title of website*. Retrieved date. From URL.

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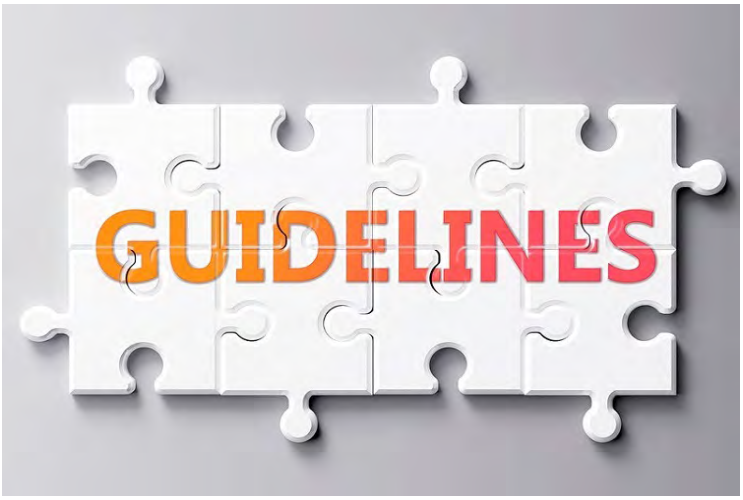

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2) ……

3) ……

hereby declare that I/we are the author(s) of the paper titles "…… ……."

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I/we accept responsibility for the statistics presented in the article, and the Institute may refer specific queries about the statistics to me/us as needed.

I/we have duly acknowledged and referenced all the sources used for this paper. I/we further authorize the editors to make necessary changes in this paper to make it suitable for publication.

I/we undertake to accept full responsibility for any misstatement regarding ownership of this article.

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- **Duration of the course - 4 months**
- **Mode of Teaching -** Self-study + 3 days Online Contact Classes
- **Total hours of Teaching -** 18 hours for Online Contact Classes (to solve queries)
- **Exam pattern -** Assignments + MCQ Final Exam

CC2 - Advanced Certificate in Health Insurance – Virtual

- **Duration of the course - 4 months** [3 hours (morning) session on **Saturday** and **Sunday**]
- **Mode of Teaching -** Virtual Training
- **Total hours of Teaching -** 90 hours
- **Exam pattern -** Project Work + MCQ Final Exam

CC3 - Certificate Course in General Insurance

- **Duration of the course - 3 months** [full day session (6 hours) on **Saturday** and half day session in morning (3 hours) **Sunday**]
- **Mode of Teaching -** Virtual Training
- **Total hours of Teaching -** 100 hours
- **Exam pattern -** Weekly Exam + MCQ pattern

CC4 - Certificate Course in Investigation and Fraud Detection in Life Insurance

- **Duration of the course - 3 days** [full day session (6 hours)]
- **Mode of Teaching -** Virtual Training
- **Total hours of Teaching -** 15 hours for Online Contact Classes
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- **Duration of the course -** Basic Level – **2 days**, Advanced Level – **3 days**
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Contact Details

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