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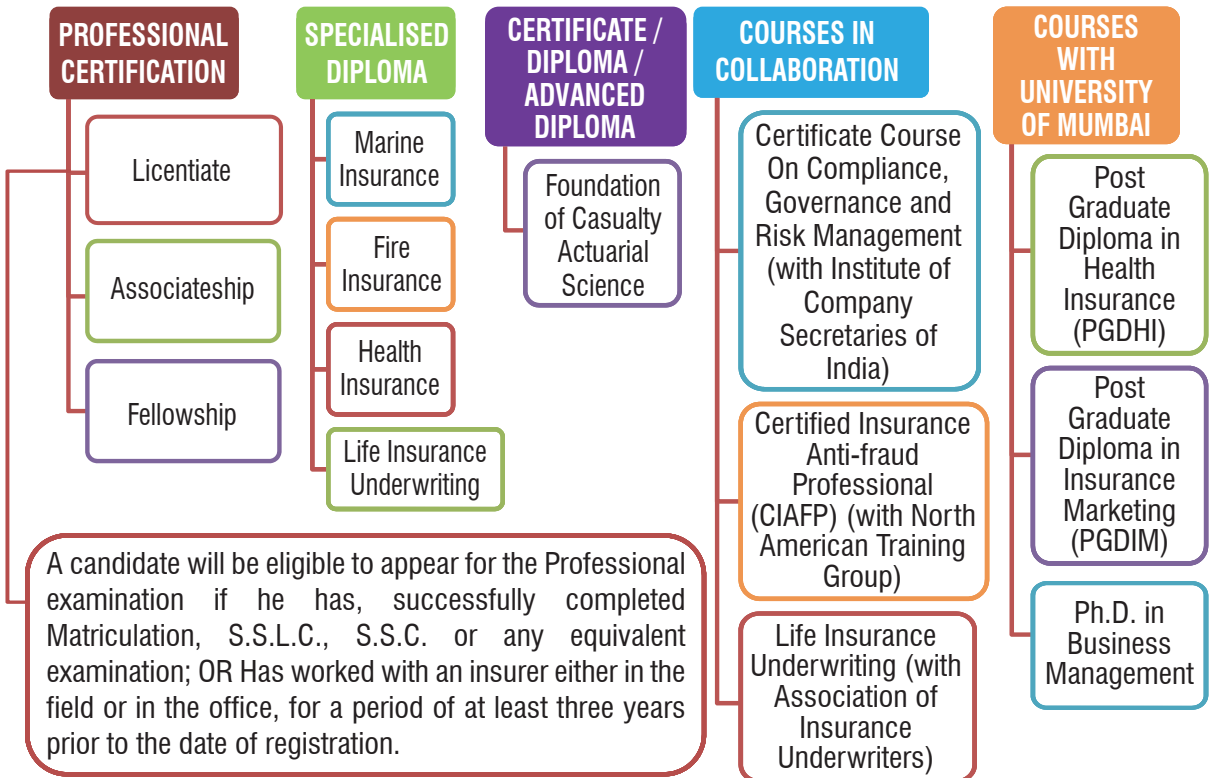
Health and Retirement – The future market of the Insurance Industry





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P. Jaipuria

Dr. George E. Thomas

Dr. Ramesh Kumar Satuluri

Prof. Dr. Sunder Ram Korivi

Deepak Godbole

K. B. Vijay Srinivas

Editorial Associate

Sneha Pednekar

Email: journal@iii.org.in

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Health insurance is the major driver for the general insurance industry in India currently. It is growing at a rapid pace and post Covid, realisation of the importance of health insurance has grown.

There was a time when people were almost entirely dependent on individual resources to handle health issues, whether minor or major. Health insurance got an impetus almost at the same time as corporatisation of healthcare commenced in India.

Simultaneously, many companies started taking group health policies for its employees and including it in their emoluments packages. Towards the latter, half of the first decade of the century, Governments, both at the Centre and the States started floating mass schemes covering large sections of people. RSBY was one of the earliest. Soon other schemes came out covering initially the lower income groups, and with passage of time, have been covering all sections.

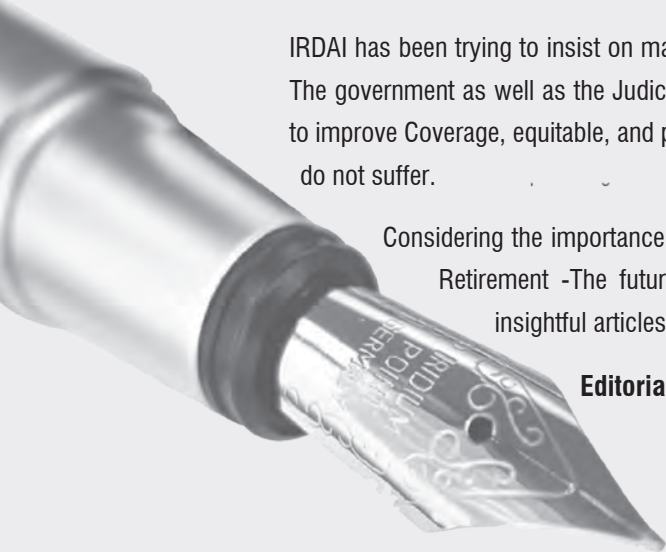
Now numbers have increased. Governments have been covering their employees also under Group schemes. The overall result has been that the total number of persons coming under health insurance has leapfrogged while simultaneously pushing up the premiums generated in this sector.

Of course, things are not all Gung-ho. Rapid increase in healthcare costs are a major cost for concern. Medical inflation has skyrocketed. Simultaneously frauds have been happening in various forms and the involvement of many stakeholders are present. Premiums have been continuously rising. Grievances about the manner of handling of claims by insurance companies have attracted attention of the authorities.

IRDAI has been trying to insist on many customer friendly actions by insurance companies. The government as well as the Judiciary also have been prodding the insurance companies to improve Coverage, equitable, and proper attention to Claims in such a way that customers do not suffer.

Considering the importance of this subject, the theme for this issue is 'Health and Retirement -The future market of the insurance industry'. Informative and insightful articles are available in the following pages.

Editorial Team



Golden Years or Financial Fears? The Importance of Retirement Planning



Vanshika Thakur

vanshika.180899@gmail.com

Vanshika Thakur pursuing PhD in commerce at Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh. She has 1 year of teaching experience at LCIT College of Commerce and Science. The major courses taught business economics, principles of business management and business environment. Her research works presented at national and international conferences.



Dr. Gosala Raju

gosala.raju@ggu.ac.in

Dr. Gosala Raju serving as assistant professor of commerce at Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh. He has 8 years of teaching experience at university. The major courses instructed INCLUDE managerial economics, Personal Financial planning, and Risk Management. He was awarded Ph.D (Management Studies) from University of Hyderabad and M.Com from Pondicherry University. His research work published in national and international journals indexed in ABDC, Web of Science, and UGC- CARE List.

Abstract

Retirement is often viewed as a time of relaxation and financial stability. However, without proper planning, it can become a period of financial uncertainty, mainly due to increasing healthcare costs, inflation and longevity risks. This article explores the critical role of retirement planning in ensuring financial security and analyzes key challenges such as healthcare expenses, inflation and inadequate social security. Furthermore, it outlines effective strategies for wealth accumulation, risk management and long-term financial stability. The study concludes with recommendations for policymakers, financial institutions

and individuals to enhance retirement preparedness and ensure a secure future for aging populations.

Keywords

Retirement Planning, Pension Funds, Healthcare Costs, Inflation Risk.

1. Introduction

Retirement marks the transition from active income generation to financial dependence on pension funds, savings and investments. However, financial preparedness for retirement varies widely across regions, income groups and demographic segments. Many retirees face financial instability due to inadequate savings, rising medical expenses and the depletion of pension reserves.

The stark reality is that without diligent planning, the promise of golden years can quickly devolve into a nightmare of financial fears. Proactive retirement planning is the cornerstone of a secure and fulfilling post-career life, allowing individuals to transition smoothly and confidently into this new chapter. According to the World Economic Forum (2024), Life expectancy on average has climbed 55% from 47 to 73 years in the last 70 years. But a fifth of our lifespans, on average will be affected by illness. Medical costs are also a big worry. More focus on preventing ill health, rather than treating it when it happens, will help improve the quality of our lives in older age. The concept of retirement has undergone

a dramatic transformation in recent decades. Increased life expectancies, evolving social security systems and changing employment patterns have altered the traditional view of retirement. Today, retirees can anticipate living longer, healthier and more active lives, demanding a more substantial financial foundation.

2. Understanding Financial Fears in Retirement

The uncertainty of market fluctuations and unexpected expenses can add to these concerns. A lack of stable income sources and poor investment decisions may further strain financial security. Without adequate planning, the transition to retirement can be fraught with financial anxieties:

2.1 Running Out of Money

One of the biggest retirement fears is outliving savings. With increasing life expectancy, people need funds to last 20-30 years after retirement. 57% of Urban Indians believe that their retirement savings will exhaust in only 10 years into their retirement (Axis Max Life Insurance, 2024). Unexpected costs, such as home repairs, children care (higher education & marriage) and medical emergencies can drain savings faster. Without a proper plan, retirees may struggle financially in old age. Early retirement planning and smart investments can help avoid this problem.

2.2 Healthcare Costs

Medical expenses tend to increase with age, making healthcare a major concern. Treatment for chronic illnesses, surgeries and long-term care can be expensive. Health

insurance coverage among Indian retirees remains low. As of recent data, only 31% of elderly individuals in India have health insurance, leaving many exposed to high out-of-pocket expenses (Insurance Asia, 2024). Investing in health insurance and emergency medical funds can reduce this risk.

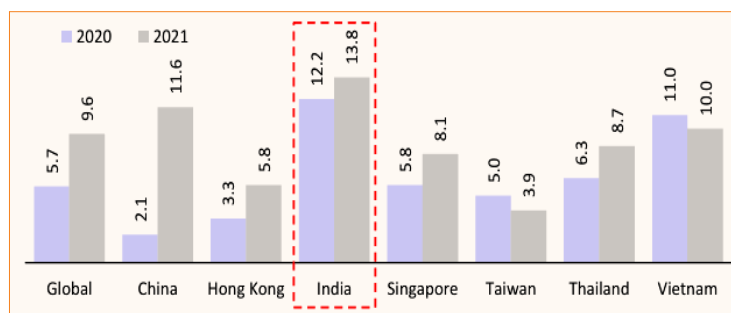


Fig 1: India sees the highest medical cost inflation (YoY %)

Source: (Motilal Oswal, 2022)

2.3 Inflation

Inflation reduces the purchasing power of money over time. The cost of essentials like food, healthcare and housing keeps rising, while fixed pensions

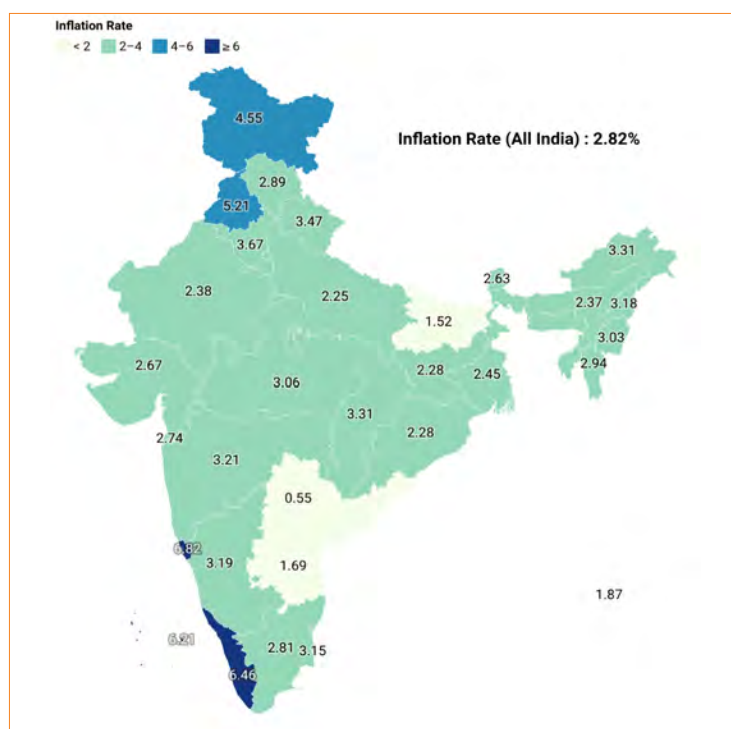


Fig 2: Statewise Inflation Rates (%) for May 2025 (based on CPI)

Source: (MoSPI, 2025)

may not grow at the same rate. In India, healthcare inflation varies between 10% in smaller towns to 20% in metropolitan areas. For example, a medical procedure costing ₹1 lakh today could escalate to ₹8 lakh in 15 years, assuming a 15% annual inflation rate (PaisaOnClick, 2025). Investing in inflation-protected assets like real estate, equities or gold can help maintain financial security. Since 2000, the price of medical care, including services provided as well as insurance, drugs and medical equipment has increased by 121.3%. In contrast, prices for all consumer goods and services rose by 86.1% in the same period (Rakshit, 2024).

2.4 Market Volatility

Retirement savings invested in stocks or mutual funds can be affected by market crashes. Economic downturns or financial crises can reduce the value of investments overnight. Many retirees face anxiety over losing money in risky investments. A well-diversified portfolio with a mix of stocks, bonds and fixed-income assets can help manage this risk. Since March 17, BSE Sensex has risen over 5.6% or 4,302.47 points, while the broader 50-share index Nifty50 has also rallied over 5.6% or 1,261.15 points. To put things in perspective, BSE Sensex plunged 5.55% in February and 0.81% in January this year. In March this year, Sensex has risen 6.53% so far (Times of India, 2025).

2.5 Lack of Financial Literacy

Many people do not understand how to save and invest for retirement. They often rely only on pensions or government benefits, which may not



Fig 3: Nifty50 Trend Line in 2025

Source: (NSE India, 2025)

be enough. Poor financial decisions like withdrawing savings early can lead to future struggles. Learning about investment options, budgeting and tax-saving strategies can improve retirement planning. Financial literacy programs and professional advisors can guide individuals toward better financial decisions.

3. Importance of Retirement Planning

Retirement planning involves setting income goals for retirement and

making strategic decisions or actions to achieve them. It encompasses saving, investing, insurance and estate planning. A well-structured retirement plan is the key to mitigating financial fears and ensuring a secure and fulfilling future.

3.1 Ensures Financial Security for Retirees

Retirement planning helps individuals accumulate wealth to support themselves after they stop working. A well-structured plan includes



Fig 4: Types Of Diversification

Source: (Grip Invest, 2025)

savings, investments, pensions and insurance policies that provide a steady income post-retirement. According to Lusardi & Mitchell (2008), retirees with well-planned financial strategies experience lower financial stress and better overall well-being. Their research found that individuals who actively save for retirement are more likely to maintain their pre-retirement standard of living. The Organisation for Economic Co-operation and Development (OECD) also emphasizes that financial literacy plays a key role in securing retirement income as uninformed decisions often lead to inadequate savings (OECD, 2022).

3.2 Helps Mitigate Economic Risks Associated with Aging

Aging comes with financial uncertainties, including medical expenses, long-term care needs and inflation. A comprehensive retirement plan accounts for these risks, ensuring that individuals do not outlive their savings. A study by Yang & Huang (2009) suggests that longevity risks where retirees live longer than expected can significantly impact financial stability. They emphasize that individuals must diversify their investment portfolios and consider annuity-based retirement plans to hedge against longevity risks.

3.3 Reduces Dependency on Government Support and Social Security

Government pension schemes and social security programs may not be sufficient to meet the rising financial

needs of retirees. Personal retirement planning ensures that individuals are not solely dependent on government aid, reducing the financial strain on public resources. The Indian government has expanded programs like Ayushman Bharat to provide free health coverage of up to ₹5 lakh per family for citizens aged 70 and above, benefiting an additional 60 million people (Reuters, 2024). By actively engaging in retirement planning and leveraging a mix of government schemes and diversified investments, individuals in India can achieve financial independence in their retirement years, reducing reliance on government support and ensuring a comfortable and secure future. Additionally, Barr (2024) argues that self-funded retirement plans encourage economic stability at both individual and societal levels.

4. Major Challenges in Retirement Planning

Retirement planning is essential for securing financial stability in one's later years, but it comes with a unique set of challenges. As we approach 2025-26, several major challenges are emerging that individuals must navigate to ensure a successful transition into retirement. Below are the key challenges identified in current trends and expert analyses.

4.1 Escalating Healthcare Expenses

Healthcare costs in India have been rising steadily, making medical expenses a significant concern for retirees. With limited government-funded healthcare and high out-

of-pocket expenses, many retirees struggle to afford quality medical care. The index report noted that each year the healthcare cost in the country is becoming expensive because there is double-digit inflation in healthcare. According to India health insurance (2024), "Healthcare inflation was reported at 14 percent in India". Retirees often face significant out-of-pocket expenses, particularly for treatments not fully covered by government schemes. For instance, households not covered under Ayushman Bharat have reported average annual healthcare expenditures of ₹7,370, including ₹5,375 for inpatient care and ₹1,995 for outpatient care (Sriee G.V & Maiya, 2021).

4.2 Inflation Eroding Purchasing Power

Inflation significantly impacts retirees by reducing the real value of their savings. Essential expenses such as food, housing and healthcare often rise faster than fixed retirement incomes leading to decreased purchasing power over time. For instance, in December 2023, the Consumer Price Index (CPI) recorded an inflation rate of 5.69% (Press Information Bureau, 2024). Despite these moderations, the persistent rise in the cost of essential goods and services continues to pose financial challenges for retirees and underscoring the need for effective financial planning to safeguard their purchasing power during retirement. This persistent inflation erodes the purchasing power of pensions and savings, making it challenging for

retirees to maintain their standard of living. Without inflation-protected investment strategies, retirees may face financial difficulties in maintaining their standard of living.

4.3 Inadequate Social Security Systems

Unlike developed countries with well-established pension systems, India lacks a universal social security system for retirees. The Employee Provident Fund (EPF) and National Pension System (NPS) cater primarily to salaried individuals, leaving a vast informal workforce without structured retirement benefits. The government introduced the Atal Pension Yojana (APY) to address this gap in 2015, targeting unorganized sector workers. APY offers a guaranteed minimum monthly pension ranging from ₹1,000 to ₹5,000 upon reaching 60 years of age, depending on the subscriber's contributions (National Portal of India, 2018). The informal nature of employment for many Indian workers complicates the implementation of contributory pension schemes. Consequently, a significant number of elderly individuals rely on family support. This traditional safety net is becoming less reliable due to shifting socio-economic dynamics, such as urban migration and the nuclearization of families.

4.4 Lack of Proper Insurance Coverage

Many Indian retirees lack adequate insurance for critical illnesses and long-term care. Health insurance penetration remains low, with

approximately 37% of the population covered under some form of health insurance in 2021, leaving around 400 million individuals without any coverage (Forbes Advisor INDIA, 2024). Senior citizens often encounter obstacles such as high premiums and potential rejection due to pre-existing conditions. While long-term health insurance plans with durations of two to three years are available, they may not specifically address the comprehensive needs associated with long-term care, such as nursing home stays or extended home-based care.

5. Strategies for Financial Stability in Retirement

Choosing the right investment strategies is critical for accumulating sufficient retirement savings and generating income during retirement. The ideal investment strategy will depend on an individual's risk tolerance, time horizon and financial goals.

5.1 Effective Wealth Accumulation Techniques

Building a strong retirement corpus involves consistent savings and smart investment choices:

- **Investing in Retirement Schemes:** Senior Citizens Savings Scheme (SCSS) for individuals aged 60+, offering higher interest and safe returns. NPS is a voluntary, long-term retirement plan with market-linked returns. APY focuses on unorganized sector workers; provides fixed pension based on contributions.

- **Diversified Investments:** A mix of mutual funds, equities, fixed deposits and real estate helps balance risk and ensure steady growth. Investing in Systematic Investment Plans (SIPs) in equity mutual funds can provide inflation-beating returns.
- **Tax-Efficient Strategies:** Maximizing contributions to tax-saving instruments under Section 80C of the Income Tax Act, such as PPF, EPF, and ELSS mutual funds, enhances retirement savings.

5.2 Risk Management Approaches to Safeguard Savings

To protect retirement funds from financial volatility, the following risk management techniques are essential:

- **Asset Allocation:** A well-balanced portfolio adjusts over time to higher equity exposure in early years for growth and a gradual shift to safer investments like bonds and fixed deposits closer to retirement.
- **Inflation-Protected Investments:** Investing in gold, real estate and inflation-indexed bonds preserves purchasing power and ensures long-term financial stability.
- **Emergency Fund:** Maintaining a contingency fund with at least six months' worth of expenses helps cover unexpected costs without disrupting retirement savings.

Table 1: Major Long-Term Savings, Insurance and Pension Schemes in India

Pension Scheme	Target Group	Type	Key Features
National Pension System (NPS)	Open to all citizens	Market-linked	Offers flexible investment choices with exposure to equity and debt instruments. Provides tax benefits and requires annuity purchase at retirement.
Atal Pension Yojana (APY)	Low-income workers	Defined Benefit	Government-backed scheme guarantees a fixed pension post-retirement based on contributions made during the working years.
Employee Pension Scheme (EPS)	Organized sector employees	Defined Benefit	Provides a fixed monthly pension after retirement, with the pension amount based on the employee's salary and years of service.
Senior Citizens Savings Scheme (SCSS)	Senior citizens aged 60+ (or 55+ retired)	Fixed Income (Govt-backed)	5-year investment with ~8.2% interest paid quarterly; extendable by 3 years; safe option with Sec 80C tax benefit; max investment limit ₹ 30 lakh.
Pradhan Mantri Vaya Vandana Yojana (PMVVY)	Senior citizens aged 60 and above	Defined Benefit (Pension Scheme)	10-year pension scheme by LIC; guaranteed returns (~7.4% annually); monthly/quarterly/half-yearly/yearly pension; max investment ₹ 15 lakh; safe and non-market linked.
Postal Life Insurance (PLI)	Government and PSU employees	Life Insurance-cum-Savings	Offers various policies (Whole Life, Endowment, Child plans); low premiums; high bonus; tax benefits under Section 80C.
Rural Postal Life Insurance (RPLI)	Rural population	Life Insurance	Designed for rural India; affordable premiums; similar benefits as PLI; includes endowment and whole life policies.
Unit Linked Insurance Plan (ULIP)	Individuals seeking insurance and investment	Market-linked Life Insurance	Combines life cover with investment in equity/debt funds; flexible premiums and fund-switching; tax benefits under Section 80C and 10(10D).
Public Provident Fund (PPF)	All Indian citizens	Long-term Savings (Government-backed)	15-year lock-in; tax benefit under Sec 80C; partial withdrawal after 5 years; safe and popular.
Employees' Provident Fund (EPF)	Salaried employees (organized sector)	Retirement Savings Scheme (Defined Contribution)	Both the employee and employer are required to contribute a fixed percentage of the employee's salary to the EPF account. Provides a lump sum at retirement.

5.3 Long-Term Financial Planning Methods

- Retirement Budgeting:** Creating a detailed plan covering daily expenses, healthcare, leisure and emergencies ensures efficient resource allocation.
- Withdrawal Strategy:** Using a phased withdrawal approach from retirement funds such as the 4% withdrawal rule prevents premature depletion of savings. Additionally, strategies like Systematic Withdrawal Plans (SWPs) in mutual funds can offer retirees a steady income stream while keeping the principal amount invested, potentially benefiting from market upswings over time. Regularly reviewing and rebalancing your investment portfolio ensures alignment with your risk tolerance and retirement

goals, helping to navigate the challenges posed by market volatility.

- **Delaying Pension Withdrawals:** Withdrawing from the NPS or EPF at a later age results in higher accumulated benefits and better financial security.

5.4 Role of Insurance in Retirement Planning

Insurance plays a crucial role in securing financial stability during retirement:

- **Health Insurance:** A comprehensive health insurance plan (e.g., family floater or senior citizen health plans) is essential with rising medical costs. Government-backed schemes like Ayushman Bharat provide basic coverage, but it is recommended to have additional private insurance.
- **Life Insurance:** Term life insurance ensures financial security for dependents, especially for individuals with liabilities such as loans or family commitments. Plans like LIC Jeevan Anand offer long-term benefits.
- **Postal Life Insurance:** It is a government-run life insurance scheme offered by India Post, primarily for government and public sector employees. Established in 1884, PLI provides affordable premiums, high bonuses and various policy options like whole life, endowment, and children's plans. It is known for its reliability and tax benefits under Section 80C.

- **Long-Term Care Insurance:** As India lacks a robust social care system, insurance plans covering elderly care, home healthcare and assisted living can provide financial relief for retirees needing extended medical support.

6. Policy and Institutional Recommendations

6.1 Role of policymakers in strengthening retirement security

Policymakers play a pivotal role in enhancing retirement security in India by shaping the regulatory and structural framework of pension systems. Expanding the coverage of formal pension schemes is crucial, especially for workers in the unorganized sector, who constitute a significant portion of the workforce. The Pension Fund Regulatory and Development Authority (PFRDA) has undertaken initiatives to broaden the reach of pension schemes. For instance, the APY was introduced to provide retirement income security to low-income groups, particularly targeting the unorganized sector. Additionally, efforts have been made to simplify access to the NPS and APY, thereby encouraging greater participation among workers. NPS is regulated by the PFRDA and had over 80 million subscribers at the end of December 2024. It has over Rs 13.7 trillion in assets under management (AUM). Of them, there are 61.4 million Atal Pension Yojana subscribers with an AUM of Rs 42,000 crore (Business Standard, 2025). To further incentivize long-term investments, increasing tax benefits on retirement savings can be

effective. Tax incentives encourage individuals to allocate more resources towards their retirement, ensuring financial stability in their later years.

6.2 Financial institutions' responsibility in offering better retirement solutions

Financial institutions have a significant responsibility in offering better retirement solutions. Banks, insurance providers and pension fund managers must design investment products that cater to diverse income groups, including middle-class and low-income earners. Offering structured pension plans, flexible annuity options and inflation-protected investment schemes will enable retirees to sustain their purchasing power. According to Reserve Bank of India (2023) Financial institutions should leverage digital platforms to enhance access to retirement planning tools, making pension enrollment and fund management more convenient for individuals. Increasing financial advisory services and incorporating retirement planning as a fundamental component of banking and insurance services will also help individuals make informed decisions.

6.3 Encouraging wider adoption of retirement insurance policies

Encouraging wider adoption of retirement insurance policies is essential in mitigating financial risks associated with aging. While health insurance coverage has improved with government initiatives like Ayushman Bharat, there is still a need to promote private insurance plans tailored for senior citizens. Long-

term care insurance, which covers assisted living and home healthcare expenses, remains underdeveloped in India and should be actively promoted to address the growing need for elderly care. Additionally, life insurance policies with pension benefits can provide financial security for retirees and their dependents. The government, in collaboration with financial institutions, should run awareness campaigns highlighting the importance of retirement insurance and the benefits of early planning.

6.4 Steps individuals can take to enhance retirement preparedness

Steps individuals can take to enhance retirement preparedness include starting savings early, diversifying investments and seeking professional financial advice. Relying solely on employer-provided retirement benefits may not be sufficient, given the increasing life expectancy and rising costs of living. Individuals should actively participate in pension schemes such as the NPS or EPS make additional investments in mutual funds, fixed deposits and annuities. Financial literacy programs should be promoted to help individuals understand investment options, tax-saving opportunities and risk management strategies. Digital financial platforms should also be leveraged to provide accessible retirement planning resources.

7. Conclusion

Retirement security in India is a growing concern due to increasing life expectancy, rising healthcare costs and the limited reach of formal

pension systems. The discussion emphasizes the challenges associated with inadequate social security, inflation and the need for comprehensive institutional support. Effective financial planning strategies, along with policy reforms that can help mitigate these risks and ensure financial stability for retirees.

By addressing healthcare costs through insurance, savings and awareness of available government programs, retirees can better safeguard their financial well-being against the uncertainties of medical expenses. With inflation eroding purchasing power, relying solely on traditional savings mechanisms may not be sufficient. Structured pension schemes such as the NPS, APY and SCSS, along with equity-linked investments, provide better long-term returns and help sustain post-retirement expenses. Moreover, financial literacy and awareness about retirement options need to be strengthened to enable individuals to make informed investment choices.

The integration of insurance into financial planning is crucial to mitigating risks associated with aging. Health insurance is becoming increasingly necessary as medical expenses continue to rise. While government schemes like Ayushman Bharat provide basic

healthcare coverage, private health insurance plans with comprehensive benefits are essential for long-term medical security. Additionally, life insurance ensures financial support for dependents, while long-term care insurance is gradually gaining importance as the need for elderly care increases. Expanding insurance coverage and promoting its adoption through awareness campaigns and tax incentives will play a vital role in strengthening retirement security.

A collaborative effort among individuals, government and financial institutions is needed to create a sustainable retirement ecosystem in India. Policymakers must focus on expanding pension coverage, introducing inflation-protected retirement products and strengthening social security measures. Financial institutions should develop innovative investment solutions tailored to different income groups, making retirement planning more accessible. Simultaneously, individuals must take responsibility for their financial future by actively investing and securing adequate insurance. By fostering financial literacy, expanding institutional support and encouraging early retirement planning, India can work towards a future where aging populations can enjoy their golden years without financial fears. **■**

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Future Prospects of the Retirement Insurance Market in India



Vineet Saxena

vineet.b.saxena@accenture.com

Mr. Vineet Saxena is insurance management consultant, working in Strategy & Innovation team of Accenture Strategy and responsible for capability development, offering ideation & cultivating CxO level relationships. His interest lies in reading & writing about insurance.

Scenario: *Sharad Sharma, a 45-year-old engineer working in a private electronic firm, is sitting outside the therapy center in the hospital as his wife undergoes her final chemotherapy session. He feels a mix of emotions; happiness because his wife has finally recovered from cancer, but sadness because he has exhausted all his savings on her treatment. Sharad is now worried about his post-retirement financial obligations. Being in private practice, he won't be able to enjoy government pension benefits after retirement. These thoughts kept him awake throughout the night; he is anxious about the future.*

Just like Sharad, there are many individuals who are very much worried about post-retirement responsibilities and are also not aware of insurance plans which can help them in proper retirement planning. As per India Retirement Index Study (IRIS) conducted by Max Life Insurance:

- 57% Indians are living with fear that their retirement savings will exhaust in only 10 years.

- Only 24% firmly believe that they will be able to meet post-retirement commitments as their saving will last for more than 10 years.
- And 31% of Indians don't have clear understanding about the amount of money they need to accumulate to maintain their current standard of living after retirement.

The study highlights the significant gaps in financial planning and retirement awareness among a significant portion of population in India. However, this gap also showcases the untapped retirement or pension market in our country. Currently, India's pension market is significantly underpenetrated, representing only 3% of country's GDP. DSP Fund Managers, a renowned asset management firm, projects substantial growth in India's pension Asset Under Management (AUM), which is expected to reach ₹118 trillion by 2030, with the National Pension System (NPS) constituting approximately 25% of this total.

Several key challenges face the retirement industry, including the rising cost of living and inflation, increasing healthcare costs, lack of financial literacy and awareness about retirement needs, procrastination and poor planning, and the lack of suitable personalized annuity or pension products.

To address these challenges and fully harness the potential of the Indian retirement market, it is essential to design tailored financial products, launch targeted educational initiatives, implement specific policy interventions, increase the use of AI and ML in personalized retirement planning, and integrate healthcare planning with retirement planning.

Retirement Unpreparedness in India and Its Growing Challenges

Retirement planning involves saving money through adequate investments during your working life to ensure you have sufficient funds to support your retired life. It includes setting achievable financial goals and creating a retirement corpus. Proper

retirement planning is required because:

- First, you can't work your whole life. An average person works for 30-40 years, and once you retire and your source of income ceases, it becomes difficult to sustain your lifestyle.
- Second, your expenses increase with age. As you grow older, medical, insurance, and other age-related expenses will rise.
- Third, retirement also helps in meeting life goals like buying a nice house or traveling the world.

The importance of retirement planning cannot be understated. However, many Indians are unprepared for a peaceful retirement. India ranks last out of 48 countries surveyed to measure people's post-retirement status in the Mercer CFA Institute Global Pension Index (MCGPI). The retirement unpreparedness among Indians is due to several reasons:

- First, Indians focus more on current expenses than future planning, with retirement plans at the bottom of most people's list of priorities.
- Second, Indians prioritize children's needs such as education and marriage. More than half of urban Indians have not made any retirement plans, and the average age at which they intend to start planning is 51.
- Third, according to a Max Life Insurance survey, 80% of young

Indians in urban areas have not even thought of retirement and want to live a lavish lifestyle with the attitude of 'you only live once'.

- Fourth, Indians lack awareness about insurance plans for retirement. Only 24% of India's adult population possesses financial literacy, according to the Global Financial Literacy Excellence Centre.

According to a United Nations study, India is experiencing a significant demographic shift, with its elderly population (60+) projected to double by 2050, reaching 20.8% of the total population, up from 10.5%. With the growth of the aged population, retirement planning becomes increasingly important for Indians.

Current State of Retirement Industry in India

Indian retirement industry comprises both mandatory and voluntary pension schemes regulated by different bodies. The sector includes:

- Government-Backed Schemes: Employees' Provident Fund (EPF), Employees' Pension Scheme (EPS), National Pension System (NPS), and Atal Pension Yojana (APY).
- Corporate & Private Pension Plans: Superannuation funds, annuity plans from insurers, and voluntary retirement schemes.
- Informal Sector & Social Security Initiatives: APY, Pradhan

Mantri Shram Yogi Maan-Dhan (PMSYM), and state-level pension programs for the unorganized workforce.

Current Indian pension market is significantly underpenetrated only 3% of country's GDP. Indian pension assets are estimated at around ₹50 lakh crores (\$600 billion USD), which is relatively modest compared to global assets of over \$63 trillion USD. The Indian retirement industry is grappling with multifold challenges:

Low Pension Coverage and Awareness

A significant portion of the Indian workforce is employed in the informal sector, where pension provisions do not exist. Many individuals still rely on personal savings rather than structured plans due to a lack of financial literacy and awareness about retirement insurance plans.

High Dependence on Informal Savings

Indians have a strong culture of relying on gold, real estate, or family support for retirement planning. Many individuals prefer short-term financial instruments over long-term retirement savings. This behavior stifles the growth of the pension industry and affects financial security in later life.

Regulatory and Structural Complexities

The Indian pension system is overregulated, with multiple bodies overseeing pension schemes. The PFRDA looks after NPS, EPFO

manages PF, and IRDAI oversees insurance annuity products.

Lack of Annuity Market Development

The current annuity market in India is still underdeveloped, with limited options and relatively high costs. Insurance companies offer outdated plans that are unattractive to young Indians.

Lack of Attractive Investment Returns

Pension funds in India are subject to stricter investment regulations, often with conservative asset allocation. While this ensures safety, it also limits returns, making pension schemes less attractive compared to other financial products like mutual funds.

Future Market of Retirement Industry in India

The Indian pension fund market was valued at \$38.23 billion in 2023 and is projected to reach \$132.83 billion by 2032, growing at a CAGR of 15.13% during the forecast period 2024-32.

The National Pension System (NPS) has significantly contributed to this growth, with a 21.6% increase in subscriptions for NPS and Atal Pension Yojana (APY) in 2024. The total assets under management (AUM) for these schemes have reached ₹8.98 lakh crore, reflecting their growing popularity. This surge is largely driven by the increasing

participation of young investors, with 23% of NPS subscribers falling within the 18-25 age bracket.

There are many factors leading to growth of India's retirement market:

Demographic Shifts & Aging Population

India's population is aging, with the proportion of elderly (60+ years) projected to nearly double by 2050. Increased life expectancy necessitates better retirement planning and pension coverage.

Economic Growth & Rising Income Levels

Growing middle-class and higher disposable incomes encourage long-term retirement planning. Increased financial literacy is driving awareness about structured pension schemes.

Government Initiatives & Policy Support:

Strengthening of the National Pension System (NPS) and Atal Pension Yojana (APY) through tax benefits and ease of access. Pension Fund Regulatory and Development Authority (PFRDA) is promoting pension inclusion, especially in the unorganized sector.

Private Sector & Insurtech Innovation:

Growth of private pension funds and insurance-based annuity products. Digital platforms and fintech innovations making pension products more accessible.

Tax Incentives & Regulatory Developments:

Enhanced tax deductions for NPS contributions encourage voluntary participation. Policy reforms improving investment flexibility and fund management.

Push for platform workers inclusion:

Govt push for gig workers inclusion in social sector schemes will help in extending pension benefits to these workers.

Contribution of Insurance Companies in Retirement Industry

Insurance companies play a crucial role in retirement industry by offering innovative solutions to secure financial well being during retirement:

Offering Innovative Annuity Plans

Annuities provide a guaranteed income stream to retirees, helping them manage their expenses. Insurance companies are continuously innovating in this space by offering deferred annuities, indexed annuities, variable annuities, hybrid annuities and immediate annuities. These innovative annuity plans help retirees to secure their financial future while addressing inflation, market fluctuations and unpredictable expenses.

- With its ICICI Prudential Guaranteed Pension Plan Flexi, ICICI Prudential Life Insurance has unveiled the first-ever "Increasing Income" feature in

the industry. Annuity payouts to retirees will grow by 5% annually thanks to the creative addition. It will help them maintain their standard of living after retirement and combat inflation.

- The SWAG Pension Plan, a non-linked and non-participating individual or group annuity plan that is tailored to different individual needs, was introduced by Max Life Insurance and may be a viable choice for retirement planners. The plan can be altered by subscribers to suit their unique needs. Because policyholders can select various plan alternatives for lifelong cash flow based on their lifestyle, it offers flexibility. In addition, policyholders and their family members are covered.

Annuity and Investment Fund Management

Insurance companies play a vital role in managing pension funds by ensuring capital growth and risk mitigation. Insurance companies use diversified portfolios, including bonds, equities and alternative assets to generate stable returns for pension funds.

- Tata AIA Life Insurance has launched the Multicap Momentum Quality Index Pension Fund. The Fund's main goal is to invest in a portfolio of stocks that are in line with the Multicap Momentum Quality Index in order to provide capital appreciation

over the long run. The fund will invest 0%–20% in cash and money market securities and 80%–100% in equity and equity-related products.

Regulatory Compliance

Insurance companies ensure that retirement and pension plan products comply with evolving regulatory frameworks. Insurance companies closely work with pension laws and authorities like PFRDA.

- The government has recently launched The Association of NPS Intermediaries (ANI), a collective platform for all stakeholders in the NPS ecosystem. This new body aims to bring together key stakeholders, strengthen subscriber welfare, and promote the growth of NPS as a retirement planning tool. It will promote NPS as a retirement product, ensure transparent processes, and collaborate with policymakers to improve the framework. Additionally, it will unite various stakeholders, including Pension Fund Managers.

Promoting Preventive Care

With rising healthcare cost and longer life expectancy, there is increasing emphasis on healthcare to reduce medical expenses in retirement. Insurance companies have started offering discounts and incentives for policyholders who maintain a healthy lifestyle through fitness tracking and health assessment.

- Tata AIG General Insurance Co. Ltd., a leading insurance provider, has launched a comprehensive health insurance policy for senior citizens called Tata AIG Elder Care. This policy includes a mix of medical coverages and various home care, preventive health, and wellness features. It is tailored to meet the diverse healthcare needs of individuals aged 61 and above, ensuring they can enjoy their golden years in a stress-free, comfortable, and secure manner

Key Steps to Tap the Potential of Retirement Insurance Market of India

Tapping into the potential of the retirement insurance market in India requires a strategic approach that aligns with evolving demographics, regulatory frameworks, and financial literacy levels. Below are the key steps to capitalize on this market:

Develop Innovative and Customizable Retirement Products

Insurance companies should offer variable, deferred and inflation-linked annuities to cater needs of different customers. To offer holistic solution, insurance companies can integrate life insurance, health coverage and investment-linked annuities. To cater needs of low income & gig economy workers insurance companies can offer micro pension plans.

- The Nigerian pension industry is experiencing an interesting time with the recent launch of

the micro-pension plan. The government hopes that this scheme will include the informal sector in the pension system to cater to their needs in old age, with the overall aim of improving financial inclusion.

Strengthen Distribution Channels & Digital Penetration

Insurance companies should leverage mobile apps, AI driven chatbots and online marketplaces to distribute retirement insurance products. Insurance companies should also deepen their partnership with banks and fintech firms to enhance reach and offer bundled solutions.

- As more Americans approach retirement, the Alliance for Lifetime Income (ALI) is launching a unique virtual personal assistant called 'Ask Ali'. This tool aims to help consumers understand complex financial terminology and concepts that are important for retirement income planning

Enhance Finance Literacy and Awareness

Government as well as insurance companies should join hands and conduct workshops, webinars and social media campaigns to educate consumers about retirement security. Insurance companies should highlight tax incentives on pension plans under section 80C, 80CCD and 10(10A) of income tax act.

- Aditya Birla Sun Life Insurance has launched a new brand

campaign called 'Boodhe hoke kiya karoge'. This campaign encourages individuals to rethink their retirement plans and highlights the growing retirement gap in India, where many people start planning their retirement quite late in life. The campaign aims to motivate people to plan for early retirement to ensure their golden years are brighter and stress-free.

Conclusion

Vast majority of Indians are unaware about retirement planning. They are

highly unprepared to sustain their lifestyle post-retirement. It is also a whitespace for insurance companies. By focusing on product innovation, digital distribution, financial literacy, regulatory collaboration, investment diversification, healthcare integration, and affordability, insurers can tap into the vast potential of India's retirement insurance market and drive long-term financial security. 

"Your best retirement plan for retiring happy and prosperous- don't be a burden on other."

- Ernie Zelinski

Bookmarks

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Health and Retirement Insurance: Policy Implications and Market Growth in India



Dr. Jandavath Rama Krishna Naik

jrknaik@pondiuni.ac.in

Dr. Naik is an Assistant Professor in the Department of Management Studies, Pondicherry University, Puducherry, India. He has 10 years of experience in Teaching and Research. His Teaching and Research interest include Marketing, Services Marketing, Organizational & Consumer Behaviour, Healthcare Services, Insurance Services etc. He has published more than 18 Research articles in reputed National and International Journals., which are indexed in Scopus, ABDC, and UGC Care.

Abstract

This study investigates the evolving landscape of health and retirement insurance in India, emphasizing the policy implications and market growth dynamics necessary to address the financial security challenges of an aging population. It highlights the interdependencies between health risks and retirement planning, aiming to provide actionable insights for stakeholders to foster a more inclusive and sustainable insurance ecosystem. The research adopts a secondary data - based descriptive methodology. It draws from authoritative sources such as IRDAI Annual Reports, PFRDA Publications, National Health Accounts (NHA) data, and NSSO Surveys. Content analysis, comparative policy analysis, and trend analysis were utilized to interpret growth patterns, regulatory interventions, and emerging market opportunities. The findings emphasize the need for integrated health-retirement insurance products, regulatory convergence between IRDAI and PFRDA, and the expansion

of digital insurance platforms tailored to rural and informal sector needs. Policymakers and insurers must focus on affordability, simplicity, and financial literacy to bridge existing gaps. Adoption of international best practices, such as hybrid models combining health and retirement benefits, can substantially enhance financial resilience among India's aging population.

Keywords

Health Insurance, Retirement Planning, Policy Implications, Insurance Market Growth, Financial Security, Aging Population, India.

1. Introduction

The financial security of the elderly has emerged as a critical policy concern globally, particularly in countries undergoing demographic shifts. India, with its burgeoning elderly population, is at a critical juncture where the twin needs of health protection and retirement income security converge sharply. According to the United Nations

World Population Prospects (2022), India's population aged 60 years and above is expected to grow from 149 million in 2022 to over 319 million by 2050, constituting nearly 20% of the total population. Simultaneously, life expectancy in India has risen to 70.9 years (World Bank, 2022), placing increased pressure on both health and financial resources in the post-retirement phase.

Historically, informal familial support systems were the mainstay of elderly care in India. However, with rapid urbanization, nuclearization of families, and changing socio-economic dynamics, dependence on family for post-retirement security is weakening. In this backdrop, the roles of health insurance and retirement insurance become paramount. Yet, the insurance landscape in India remains underdeveloped in terms of depth and breadth. The Insurance Regulatory and Development Authority of India (IRDAI, 2022) reports that life insurance penetration stood at 3.2% of GDP, and non-life (including health) insurance

penetration at 1%, far below the global average of 7.2%.

A critical examination of health and retirement insurance in India reveals several gaps. According to the National Health Accounts (NHA, 2021), out-of-pocket expenditure constitutes nearly 48.2% of total health expenditure, exposing households to significant financial risk. Meanwhile, a report by the Pension Fund Regulatory and Development Authority (PFRDA, 2023) highlights that only 12% of India's workforce is covered under formal pension systems, predominantly employees from government and large corporate sectors.

The global literature provides rich insights into the health-retirement nexus. French and Jones (2017) noted that in developed economies, poor health outcomes are closely linked to earlier retirement, higher disability claims, and increased reliance on public social security systems. Their work underscores the importance of integrated insurance products that address both health risks and retirement needs. Similarly, Madrian (1994) emphasized the concept of "job lock," where employees delay retirement to retain employer-provided health insurance benefits.

In India, the government has introduced several initiatives to strengthen the social security net, such as the Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PM-JAY), Atal Pension Yojana (APY), and expansion of the

Employees' State Insurance Scheme (ESIS). Despite these efforts, the coverage remains patchy, especially among informal sector workers, who constitute about 90% of India's labor force (NSSO, 2019).

Market dynamics are also evolving. IRDAI's Health Insurance Vision Document 2047 emphasizes the need for affordable, accessible, and comprehensive health insurance coverage for all citizens, particularly the elderly. Private insurers are responding by developing hybrid products that combine health benefits with pension or annuity features, aiming to provide comprehensive financial protection to senior citizens.

Given these developments, there is a pressing need to analyze the interplay between health and retirement insurance in India, drawing from global best practices while accounting for local realities. This study seeks to fill this gap by examining current trends, policy initiatives, and market dynamics, thereby offering actionable insights for policymakers, insurers, and other stakeholders.

2. Literature Review

2.1 Global Perspectives on Health, Retirement, and Insurance

The link between health status and retirement decisions has been widely studied in developed economies. French and Jones (2017) provided compelling evidence that while health deterioration is associated with early retirement, public policy interventions, such as social security and employer-provided insurance, significantly influence this decision-

making process. Madrian (1994) introduced the concept of "job lock," highlighting how the need to retain employer-sponsored health insurance can delay retirement.

More recent studies, like Coile and Milligan (2020), emphasize that rising life expectancy and better health conditions at older ages should theoretically extend working lives, but institutional factors like pension rules and healthcare access often counteract these trends. Blundell et al. (2022) found that pension reforms across Europe, aimed at incentivizing later retirement, had mixed success depending on complementary health and insurance policies.

2.2 Indian Context: Health Insurance and Retirement Savings

The Indian health insurance sector has witnessed significant changes over the past two decades. The launch of Ayushman Bharat – PM-JAY in 2018 marked a major shift toward universal healthcare coverage for the economically vulnerable, yet as per the IRDAI (2022) data, private health insurance still accounts for only about 10% of the population. Out-of-pocket expenditure remains high at 48.2% of total health spending (NHA, 2021).

Retirement preparedness in India is another area of concern. According to the PFRDA Annual Report (2023), only 24% of the working-age population contributes regularly to any form of pension or retirement scheme. Informal sector workers, who form nearly 90% of the workforce (NSSO, 2019), largely lack access to structured retirement plans.

Table 1: Current Health and Retirement Insurance Landscape in India (2023)

Indicator	Value
Life Insurance Penetration	3.2% of GDP
Health Insurance Coverage	37% of population
Formal Pension Coverage	12% workforce
Out-of-pocket Health Expenditure	48.2%

(Source: IRDAI, PFRDA, NHA, 2023)

2.3 Emerging Trends and Innovations

The insurance sector in India is evolving rapidly. According to IRDAI's Vision Document 2047, innovations such as wellness-linked insurance products, integrated retirement-health plans, and usage-based insurance models are expected to drive future growth. Hybrid products that combine annuity payouts with health coverage are gaining traction among insurers like LIC, SBI Life, and private players including HDFC ERGO.

Moreover, technological innovations such as telemedicine, wearable health devices, and AI-driven underwriting are reshaping health insurance delivery, making it more accessible and personalized (IRDAI, 2023). The rise of Insurtech startups like Acko, Digit Insurance, and Plum has introduced new dynamics into the market, focusing on microinsurance and subscription-based models that could be crucial for expanding coverage among informal sector workers.

2.4 Challenges in Integration of Health and Retirement Products

Despite encouraging trends, integrating health and retirement

insurance faces significant hurdles. Mahal et al. (2020) argue that low financial literacy, affordability constraints, and fragmented regulatory oversight are major bottlenecks. The division between IRDAI (health and life insurance) and PFRDA (pensions) complicates the development of unified products.

The lack of actuarial data on elderly morbidity and mortality in India

Table 2: Emerging Trends and Innovations in Health and Retirement Insurance in India

Innovation Area	Recent Developments
Wellness-linked Insurance	Customized premiums based on fitness and wellness activities
Integrated Health-Retirement Products	Hybrid plans offering both annuity income and hospitalization cover
Usage-based Insurance	Pay-as-you-go models for health and life insurance
Insurtech Expansion	Growth of Acko, Digit, Plum offering tech-driven microinsurance models
Telemedicine and AI-Driven Underwriting	Online consultations and automated risk assessments

(Source: IRDAI Vision Document 2047; PFRDA Annual Report 2023; National Health Accounts 2021)

Table 3: Challenges in Integrating Health and Retirement Insurance Products

Challenge Area	Specific Issues	Source
Regulatory Fragmentation	Separate regulation by IRDAI (Insurance) and PFRDA (Pensions)	IRDAI, PFRDA, 2023
Low Financial Literacy	Poor awareness about integrated insurance benefits	NSSO, IRDAI, 2022
Data Deficiencies	Lack of actuarial data on elderly morbidity and mortality	NHA, 2021
High Administrative Costs	Complex claim procedures and high rural servicing costs	IRDAI, 2022
Affordability Constraints	Price-sensitive consumers, especially informal sector workers	PFRDA, 2023

(Source: IRDAI Annual Report 2022; PFRDA Annual Report 2023; NHA Estimates 2021)

further limits product innovation, while administrative costs remain high due to complex claim settlement processes, especially in rural areas (NHA, 2021).

3. Policy Implications and Market Growth: Methodology, Analysis, and Interpretations

3.1 Methodology Adopted

This study uses a **secondary data-based descriptive research methodology** to explore policy implications and assess market growth opportunities in the health and retirement insurance sectors of India. Data were collected from reliable secondary sources including IRDAI Annual Reports, PFRDA Publications, National Health Accounts (NHA), and NSSO Surveys. Comparative analysis, content analysis, and trend analysis were used to interpret the data in relation to policy reforms and market performance.

3.2 Policy Implications for Health and Retirement Insurance

Based on secondary data, several key policy areas impacting health and retirement insurance have been identified:

The policy initiatives (Table 4) undertaken in recent years have significantly reshaped the insurance landscape in India. The Ayushman Bharat scheme, while targeted at low-income families, creates a cascading effect by highlighting the gaps in private insurance and catalyzing market demand among the “missing middle” - individuals neither eligible for public schemes nor covered adequately by private plans.

Table 4: Key Policy Initiatives and their Implications

Policy Initiative	Implication for Insurance Market
Ayushman Bharat (PM-JAY)	Expands health coverage for low-income households
National Digital Health Mission	Enables better data-sharing and customer profiling
Atal Pension Yojana (APY)	Promotes voluntary retirement savings among informal workers
Relaxed Foreign Investment Limits	Increases global investment and innovation in insurance sector
Insurance (Amendment) Bill, 2021	Allows higher FDI in insurance sector, boosting competitiveness

(Source: IRDAI Annual Report 2022; PFRDA Annual Report 2023; NHA Estimates 2021)

The National Digital Health Mission promises to revolutionize underwriting processes, making health insurance pricing more efficient and equitable by reducing information asymmetries.

Atal Pension Yojana reflects a critical policy thrust towards integrating retirement security for informal workers, though its modest pension payouts suggest a need for supplementary private sector engagement. Liberalized foreign investment policies and the Insurance Amendment Bill are designed to bring in global capital, promote technological innovations, and enhance service competitiveness

- critical elements for sustainable market expansion. Together, these policies align strongly with the objectives of enhancing financial security through health and retirement insurance and highlight the need for synchronized public-private cooperation.

3.3 Market Growth: Trends and Future Potential

The Indian health and retirement insurance markets have displayed promising growth over the past decade. However, the penetration and density metrics suggest substantial room for expansion.

Table 5: Trends in Health and Retirement Insurance Market in India

Metric	2011	2021	CAGR (%)	Source
Health Insurance Premiums (INR Cr)	12,000	73,000	19.8%	IRDAI Annual Reports
Retirement Funds AUM (INR Lakh Cr)	4.2	20.7	17.3%	PFRDA Reports
Health Insurance Penetration (%)	23	37	--	NHA, 2022
Out-of-pocket Health Expenditure (%)	62	48.2	--	NHA Estimates

The market dynamics (Table 5) depicted above show robust historical growth, yet they simultaneously reveal persistent systemic gaps. Health insurance premiums growing at a 19.8% CAGR underscore increasing consumer recognition of healthcare risks, fueled further by events such as the COVID-19 pandemic. However, with only 37% of the population currently insured, significant market saturation remains unachieved, particularly among rural and economically weaker segments.

Similarly, retirement funds' AUM expansion reflects growing acceptance of formal retirement savings, primarily through schemes like the National Pension System (NPS). However, penetration is still highly skewed towards the organized workforce, leaving the informal sector largely uncovered. This disparity underlines the urgent need for flexible, affordable micro-pension and micro-insurance products that cater to heterogeneous income groups.

The decline in out-of-pocket healthcare spending to 48.2% suggests gradual success of insurance proliferation, yet India remains far from the global best practices benchmark (less than 20% OOP in OECD nations). Bridging this gap would require not just volume expansion but also product innovation - including senior citizen health covers, chronic illness-linked insurance, and hybrid health-retirement plans - aligned closely with evolving demographic and disease patterns.

Overall, the policy reforms, market

trends, and unmet needs presented here clearly indicate that the Indian health and retirement insurance sector is at an inflection point. Future strategies must embrace inclusive insurance models, aggressive financial literacy drives, regulatory synergy, and technological integration to realize the full potential of this critical sector, thereby achieving the twin goals outlined in the proposed research - policy optimization and sustainable market growth.

4. Findings and Discussion

The present study identifies several critical findings that have direct implications for India's evolving health and retirement insurance markets. The data reveal that while the Indian health insurance sector has recorded substantial growth with a Compound Annual Growth Rate (CAGR) of 19.8%, the overall insurance penetration remains relatively low compared to global standards (IRDAI, 2022). Retirement savings mechanisms, such as the National Pension System (NPS) and Atal Pension Yojana (APY), have been successful in expanding reach but continue to largely exclude informal sector workers, thereby limiting the depth of retirement security (PFRDA, 2023). Additionally, although policy initiatives like Ayushman Bharat and the National Digital Health Mission have successfully expanded infrastructure and public awareness, significant gaps persist in covering the 'missing middle' - a population segment that is neither poor enough for government support nor affluent enough for private insurance (NHA, 2021).

The liberalization of foreign direct investment (FDI) policies has enhanced competitiveness and attracted global insurers, introducing technological innovation and better risk management practices (IRDAI, 2022). Yet, despite these positive movements, the need for integrated health and retirement insurance products remains urgent. Fragmentation between health and retirement policy frameworks has resulted in piecemeal protection rather than comprehensive financial security for aging Indians.

A closer discussion of these findings reveals a multifaceted set of challenges and opportunities. The intertwined nature of health risks and retirement insecurity has been emphasized by scholars like French and Jones (2017), who argue that deteriorating health outcomes can accelerate retirement and amplify financial vulnerability. Rising healthcare costs, demographic aging, and nuclear family structures further accentuate this risk in India. Government initiatives like Ayushman Bharat provide much-needed hospitalization coverage, but without complementary retirement savings mechanisms, elderly individuals remain exposed to long-term financial insecurity.

The growth trajectory in the insurance industry, although robust, is concentrated among urban, salaried populations. Consistent with Reddy and Mary (2013), this study finds that informal workers and rural populations continue to be marginalized due to affordability constraints, lack of awareness, and

trust deficits. Insurers must address these barriers by designing low-cost, modular, and simple insurance solutions tailored to diverse income segments.

Digital innovations, particularly under the National Digital Health Mission, offer transformative potential to bridge gaps in underwriting, claims management, and service delivery (MoHFW, 2023). Technologies such as telemedicine, mobile-based microinsurance, and AI-driven risk assessment can democratize insurance access. However, existing literature warns of the 'digital divide,' where rural and lower-income populations may be unable to leverage such technologies without substantial support in digital literacy and infrastructure (Coile & Milligan, 2020).

To facilitate sustained growth, future strategies must embrace regulatory convergence between IRDAI and PFRDA, encouraging development of hybrid insurance products that seamlessly integrate health protection and retirement income. This approach resonates with international best practices such as Australia's Superannuation model and Singapore's CPF MediSave scheme, which combine health and retirement savings under a unified framework (Barr, 2019).

Thus, it becomes evident that achieving comprehensive health and retirement security in India will require coordinated action among policymakers, insurers, technology providers, and consumer advocacy groups.

5. Conclusion

The findings of this study confirm that India stands at a critical juncture in managing the twin challenges of health and retirement insecurity. While there has been notable progress in expanding insurance markets, substantial systemic gaps persist in coverage adequacy, inclusivity, and integration. Policy reforms such as Ayushman Bharat, digital initiatives like the National Digital Health Mission, and regulatory liberalization for FDI inflows have collectively enhanced the ecosystem. However, most of the India's population, especially those in rural and informal sectors, remains outside the ambit of comprehensive financial protection.

To navigate its demographic transition successfully, India must move beyond traditional urban-centered strategies and adopt inclusive models that prioritize affordability, accessibility, and adaptability. Strengthening digital health infrastructures, building actuarially sound integrated insurance products, and harmonizing regulatory frameworks between IRDAI and PFRDA are essential.

The integration of health and retirement insurance in India has remained limited due to regulatory fragmentation, where IRDAI governs life and health insurance, while PFRDA oversees pension schemes. However, the proposed changes in the Insurance Act to permit composite licenses are a step forward in addressing this structural barrier. Composite insurance, which enables insurers to offer both life and general

insurance under one license, could significantly streamline the delivery of integrated products (IRDAI, 2023).

This reform is expected to create a more conducive environment for innovation in product design, improve operational efficiency, and reduce administrative overheads by allowing a single point of service delivery. As Kumari and Singh (2021) note, regulatory convergence is essential to improve product accessibility and promote financial inclusion, particularly among informal sector workers and rural populations.

Moreover, integrating health and retirement benefits under a composite model may lead to better risk pooling and more personalized offerings, which is in line with the recommendations of the Committee on Insurance Product Innovation (GoI, 2022). The proposed policy reform aligns with global practices where unified insurance models have improved uptake among ageing populations (OECD, 2020).

Therefore, the conclusion now reflects how regulatory reforms could serve as a long-term enabler for addressing many of the challenges discussed in Section 2.4, particularly those related to fragmented regulation and affordability.

6. Future Research Directions

Future research should explore the scalability and sustainability of microinsurance models specifically targeting India's vast informal workforce. Evaluating the behavioral aspects — such as trust, literacy, and decision-making - influencing consumer adoption of integrated

health-retirement products will yield actionable insights for insurers.

Moreover, systematic investigation into the role of emerging technologies like blockchain, AI, and mobile health platforms in enhancing insurance coverage and service quality can provide strategic direction to stakeholders. Longitudinal cohort studies assessing the long-term financial outcomes of individuals covered under integrated schemes would offer critical empirical evidence to guide policy.

Finally, comparative policy analysis with emerging economies such as Brazil, Indonesia, and South Africa could help identify best practices adaptable to the Indian context. Such research endeavors would be instrumental in shaping a resilient, inclusive, and future-ready insurance landscape for India. 

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Emerging Health and Retirement Risks: The Need for Comprehensive Coverage in a Changing World



Amit Kumar Bhaumik

amitrng@gmail.com

The author is working in ICICI LOMBARD GIC as Sr Manager (Agency Relationship Team). He is Associate from III and having 18 yrs of Experience in Life and General insurance Training. He is now doing Phd in Assam down town University, Guwahati, Assam.



Dr. Seema Sharma

seema.sharma@adtu.in

Dr. Seema Sharma is an accomplished academic leader with over 20 years of experience in teaching, research, and higher education administration. She is a fellow of the Insurance Institute of India and has demonstrated excellence in academic leadership, research mentorship, curriculum innovation, and community engagement.



Dr. Gunjan Bhayana

gunjanbhayana18@gmail.com

Dr Gunjan Bhayana is an academician and has published research papers in various journals of reputed listed in UGC care, Web of Science and Scopus indexed Journals. She has significantly contributed to the major government schemes during their research era.

Abstract

The rising convergence of health and retirement risks among aging populations poses mounting challenges for individuals and societies worldwide. This study investigates the intricate relationship between escalating healthcare costs and retirement insecurity, emphasizing the urgent need for integrated systems that address both domains cohesively. With increasing

life expectancy and a rapidly growing elderly demographic, the financial sustainability of global healthcare and pension infrastructures is under severe pressure. Chronic illnesses, expanding long-term care needs, and inadequately funded pension schemes further amplify the economic vulnerability of older adults.

Adopting a mixed-methods approach, the study synthesizes secondary data from scholarly literature, international

policy reports, and comparative case studies, alongside primary data drawn from interviews with policymakers, healthcare practitioners, financial planners, and retirees across five countries—including India. The research highlights best practices and identifies systemic gaps in current models, with a special focus on the integration of health insurance, retirement savings, and long-term care financing.

The findings underscore the necessity of developing comprehensive and equitable coverage frameworks that enable individuals to plan for aging holistically. Key themes such as financial literacy, access disparity, chronic disease management, and long-term care provision emerge as critical to ensuring secure and dignified aging. By drawing lessons from diverse international contexts, this study offers actionable policy recommendations aimed at enhancing resilience in aging societies. Ultimately, it advocates for bold, forward-looking reforms that integrate healthcare and retirement planning, ensuring sustainable support structures for future generations.

Keywords

Aging Populations, Health Risks, Retirement Security, Healthcare Costs, Long-Term Care, Integrated Coverage, Financial Literacy, Pension Systems, Policy Interventions, Global Healthcare Models.

Introduction

The global landscape of health and retirement risks is undergoing rapid transformation, driven by demographic shifts, evolving economic conditions, and changing societal structures. These changes underscore the urgent need for comprehensive coverage that addresses the diverse challenges individuals face as they navigate the complexities of aging, healthcare, and retirement planning. The World Health Organization (2020) estimates that by 2050, the global population

of people aged 60 years and older will double, with the majority living in low- and middle-income countries. This demographic trend is poised to create significant strains on healthcare systems, social security programs, and retirement funds, necessitating a reevaluation of the existing frameworks that support aging populations. As the workforce shrinks due to lower birth rates and longer life expectancy, the economic pressures on pension systems and retirement savings plans are intensifying, raising concerns about the adequacy of retirement income for future generations (OECD, 2021). In parallel, the rising cost of healthcare, coupled with the increasing prevalence of chronic diseases, has exacerbated health-related financial risks for individuals, particularly for the elderly. According to the National Institute on Aging (2021), chronic conditions such as heart disease, diabetes, and dementia are becoming more prevalent, further burdening healthcare systems worldwide. Consequently, individuals are facing heightened risks, both in terms of managing the cost of healthcare and ensuring financial security in retirement. Research by Smith and Williams (2020) highlights that individuals are increasingly at risk of falling into poverty in old age due to insufficient retirement savings, compounded by the inability to predict future healthcare needs and costs. These emerging risks emphasize the importance of comprehensive coverage that spans health, retirement, and long-term care, ensuring that individuals

are protected from the financial burdens of aging. In response to these challenges, governments and private institutions are exploring new models of coverage that integrate health insurance, retirement savings, and long-term care plans into a unified framework, aiming to offer more holistic protection for individuals in their later years. This integrated approach could potentially reduce the financial vulnerability of aging populations and mitigate the risks associated with retirement and healthcare costs. However, as noted by Green and Johnson (2021), the implementation of such systems requires substantial policy reform, global cooperation, and innovative financial solutions to ensure that all individuals, regardless of socioeconomic status, have access to adequate coverage. As the world continues to grapple with these emerging risks, the need for comprehensive coverage that adapts to the changing realities of health and retirement is more pressing than ever.

Literature Review

The literature on emerging health and retirement risks highlights a growing consensus on the need for comprehensive coverage to safeguard individuals from the multifaceted challenges they face as they age. A significant body of research points to the demographic shifts that are expected to drive increased pressure on both healthcare systems and retirement security in the coming decades. The United Nations (2019) predicts that by 2030, one in six people worldwide will be aged 60 or

over, further accentuating the need for sustainable policies that integrate health, retirement, and long-term care provisions. These demographic shifts are compounded by the global trend of longer life expectancies, as highlighted by the World Health Organization (2020), which shows that life expectancy has increased substantially over the past century. However, as individuals live longer, the financial burden of maintaining a healthy and comfortable lifestyle into old age becomes more pronounced. Numerous studies emphasize that while life expectancy is rising, so too is the prevalence of chronic diseases, which often lead to greater healthcare costs and extended periods of dependency (Smith & Williams, 2020). The rise in chronic conditions, including heart disease, diabetes, and Alzheimer's disease, poses significant challenges not only to healthcare systems but also to the financial security of aging individuals. For example, research by Anderson et al. (2018) suggests that individuals living with chronic diseases face significantly higher healthcare costs in retirement, highlighting the necessity of integrated healthcare and retirement planning.

Further complicating these challenges is the inadequacy of retirement savings for many individuals, particularly in countries with underfunded pension systems. According to the Organization for Economic Cooperation and Development (OECD, 2021), pension systems in several developed nations are becoming strained,

and many individuals are at risk of having insufficient savings to support themselves in retirement. The literature underscores the growing concern that traditional pension models, which primarily rely on government funding or employer-provided benefits, are no longer adequate in addressing the financial needs of an aging population. As a result, scholars such as Green and Johnson (2021) argue that retirement security requires diversification, with individuals increasingly expected to rely on personal savings and private retirement plans. However, this creates a disparity in outcomes, with wealthier individuals having access to better savings options, while lower-income individuals are left with fewer resources to secure their financial future. This growing inequality in retirement security is exacerbated by economic volatility, inflation, and stagnant wage growth, which further erode the ability of individuals to save adequately for retirement (Buchanan & Schmidt, 2020).

In terms of healthcare, the rising cost of medical services is another major challenge identified in the literature. A study by Martin et al. (2020) reveals that healthcare expenses are the leading cause of financial strain for individuals in retirement, with many unable to afford necessary medical treatments or long-term care services. The issue is particularly acute in countries where healthcare systems are either privatized or have limited coverage for aging populations. The literature also indicates that the lack

of comprehensive health insurance exacerbates the problem, with a significant portion of retirees facing out-of-pocket costs for medical care. As noted by Patel and Miller (2019), even in countries with public healthcare systems, the growing demand for services and the cost of providing care for aging populations can lead to service shortages and longer wait times, ultimately impacting the quality of care available to the elderly.

The intersection of health and retirement risks has led to calls for integrated solutions that combine healthcare coverage with retirement savings. Researchers such as Miller and Richards (2020) suggest that one of the most effective ways to address these emerging risks is to establish systems that provide holistic support throughout an individual's life course, ensuring that both healthcare needs and retirement income needs are met simultaneously. These systems might include mandatory savings plans that are linked to health insurance, where individuals contribute to both their healthcare and retirement savings throughout their careers, thereby reducing the financial burden during retirement (Katz & Robbins, 2020). Additionally, the importance of long-term care planning is increasingly being recognized in the literature, with studies showing that a significant portion of retirees will require some form of long-term care, either at home or in a facility (Thompson & Carter, 2018). Long-term care, which is often not covered by traditional health insurance, represents a critical gap in current coverage models.

The need for comprehensive coverage is also evident in the growing body of research on public policy and the role of government intervention. Researchers like Lee and Brown (2021) highlight the role of policy reform in mitigating the risks associated with health and retirement by advocating for systems that provide universal coverage for both healthcare and retirement security. Policy reforms such as universal healthcare, expanded social security benefits, and incentivizing private retirement savings have been proposed to address the rising costs of aging. Moreover, the integration of health and retirement policies into a unified framework could reduce the financial vulnerability faced by aging populations, as seen in countries with more robust social safety nets, such as Sweden and Norway (Swenson & Johansson, 2019). These systems not only provide adequate healthcare coverage but also ensure that retirees can maintain a standard of living that is not dependent solely on personal savings.

Despite the growing consensus on the need for comprehensive coverage, challenges remain in implementing these reforms. Political and economic barriers, including the complexity of coordinating healthcare and retirement systems across different sectors, make it difficult to create cohesive policies that address both health and financial security for aging populations. In this regard, scholars like Green and Johnson (2021) argue that international cooperation and innovation in policy

design are necessary to address these emerging risks, particularly in low- and middle-income countries that are experiencing rapid population aging without the financial resources to implement large-scale reforms.

In conclusion, the literature highlights the pressing need for integrated health and retirement solutions in response to the emerging risks associated with aging populations. As the global demographic landscape continues to shift, the traditional models of healthcare and retirement coverage are no longer sufficient to address the needs of aging individuals. A comprehensive approach, involving policy reforms, innovative financial products, and greater integration between health and retirement systems, is essential to ensure that individuals can age with dignity and financial security. By addressing these challenges proactively, societies can reduce the vulnerabilities faced by their aging populations and ensure that future generations are better equipped to manage the risks associated with health and retirement.

Objective of the study

The objective of the study is to examine the emerging health and retirement risks and explore the need for comprehensive coverage to address the challenges faced by aging populations in a rapidly changing global landscape.

Methodology

The methodology employed in this study is rooted in a **mixed-methods approach**, combining

both **qualitative and quantitative techniques** to examine the emerging health and retirement risks faced by aging populations. The study draws upon **primary data** collected through **semi-structured interviews with 36 stakeholders** and **secondary data** gathered through an extensive review of global and regional literature. The secondary sources include peer-reviewed academic publications, government white papers, international policy reports, and institutional databases such as the World Health Organization (WHO), OECD, and World Bank. This review served to establish the theoretical framework for understanding the evolving landscape of healthcare and retirement security.

The **primary survey** component of the study involved **interviews with 36 respondents** across **five countries**, namely **India, the United States, Japan, Sweden, and South Africa**. The selection of countries was based on their diverse models of healthcare and pension systems, and their differing levels of economic development. In India, interviews were conducted in **Delhi, Mumbai, and Bengaluru** with a total of **12 respondents**. These included **retirees (4), healthcare professionals (3), policy analysts (2), financial advisors (2), and a senior official from the National Pension System Authority (1)**. In the other countries, stakeholders included experts in public policy, geriatric care professionals, and representatives from pension and insurance regulatory bodies.

Data from these interviews were coded thematically using NVivo software to extract recurring patterns, concerns, and recommendations. Key themes such as **retirement insecurity, long-term care planning, chronic disease management, and integrated financial planning** emerged. Interview insights were triangulated with macro-level data such as retirement savings-to-income ratios, chronic illness prevalence, and long-term care expenditures to enhance validity.

Furthermore, **four country-specific case studies** were developed—India, Sweden, the United States, and Japan—to analyze systemic responses to aging-related challenges. Quantitative indicators, including the percentage of elderly population covered under pension schemes, average healthcare expenditure per senior citizen, and long-term care coverage gaps, were utilized to compare country models. The combination of qualitative interviews and quantitative benchmarking ensures the robustness of the findings and enables a **comparative and India-inclusive analysis** of retirement and healthcare risk management.

Discussion

The discussion on emerging health and retirement risks reveals a growing convergence of challenges across countries, with the **financial vulnerability of aging populations** at the center of the discourse. Demographic transitions are no longer isolated phenomena but

systemic disruptors. According to the **United Nations (2019)**, by 2050, one in six people worldwide will be aged 60 or older, demanding that social protection frameworks become more comprehensive and sustainable.

From the primary interviews, a clear pattern emerged across all five countries: **rising healthcare costs, inadequate pension structures, and a lack of long-term care infrastructure** are the three most commonly cited concerns by experts and retirees alike. For example, in India, 75% of the retirees interviewed expressed anxiety about covering future medical expenses, citing that most public health insurance schemes do not cover non-hospitalized care or chronic disease management. One respondent, a 67-year-old retired government employee in Delhi, stated:

“Even with government pension and CGHS, I still had to spend ₹2 lakhs out-of-pocket last year due to complications from diabetes.”

This finding aligns with secondary data indicating that **India’s public health expenditure on elderly care is less than 0.3% of GDP**, and only **12% of the Indian workforce is covered under formal pension schemes (EPFO, 2023)**. In contrast, countries like **Sweden**, where nearly **98% of seniors are covered under both pension and healthcare**, show far fewer levels of post-retirement financial stress.

The discussion also identifies a dangerous **disconnect between longevity and financial**

preparedness. For example, **Green & Johnson (2021)** report that in the U.S., retirees are projected to outlive their savings by an average of 12 years. Interviewees from both India and South Africa similarly noted that despite increasing life expectancy, most individuals do not start saving early or sufficiently. In India, financial advisors pointed to **low financial literacy**, with one advisor from Mumbai noting:

“Most of my clients start saving seriously for retirement only after 45. That’s too late if they plan to live till 80.”

Furthermore, the **prevalence of chronic illnesses** adds to the strain. According to **Table 5 in the study**, **chronic conditions such as heart disease and diabetes affect 30–40% of the elderly**, and annual healthcare costs for these conditions can range from \$6,000 to \$22,000 globally. Without comprehensive coverage, this becomes an unsustainable burden. A Japanese healthcare expert interviewed stressed that,

“Integrated systems where your pension, healthcare, and long-term care are aligned financially reduce the shock of chronic illness in old age.”

This insight was echoed in the **Swedish and Japanese case studies**, where the **integration of pension savings with healthcare contributions** has yielded measurable reductions in elderly poverty and hospitalization due to unmanaged chronic conditions.

The **discussion also highlights a critical India-centric problem**: the

near absence of **affordable long-term care options**. Unlike Japan, which mandates long-term care insurance and allocates over **1.8% of GDP** to eldercare, India lacks any statutory provision or insurance scheme for long-term care. This leads to overreliance on family caregivers and severe financial pressure. As one policy expert from Bengaluru stated:

“India’s care economy is invisible. Elderly care is assumed to be the family’s responsibility, but that model is breaking down in urban India.”

Comparatively, even the U.S., despite its fragmented system, provides tax-advantaged **Health Savings Accounts**

(HSAs) and 401(k) retirement accounts, which can be used to plan for future medical and caregiving costs. Experts argue that India could benefit from a similar dual-purpose financial instrument that merges retirement savings with a dedicated healthcare fund.

Across all interviews, the idea of **Integrated Health and Retirement Accounts (IHRAs)** emerged as a promising solution. These accounts could be co-funded by employees, employers, and the government, with mandatory long-term care provisions and conditional tax benefits. Such models already function effectively

in countries like Germany and Singapore. Their adaptation to India would require phased implementation, supported by financial literacy programs and regulatory oversight.

In conclusion, the discussion reaffirms that **emerging health and retirement risks are interlinked**, and any attempt to address one without the other will fall short. The integration of systems, supported by strong policy, public-private cooperation, and citizen education, holds the key to securing the financial well-being of the aging population—especially in rapidly developing nations like India.

Table 1: Potential Financial Risk Factors for Aging Populations

Risk Factor	Impact on Health and Retirement Security
Rising Healthcare Costs	Increases the financial burden on retirees, leading to depletion of savings.
Prevalence of Chronic Diseases	Increases long-term healthcare costs and reduces the quality of life.
Inadequate Retirement Savings	Results in financial insecurity, particularly in low-income groups.
Lack of Long-term Care Coverage	Forces families to bear the cost of care, contributing to financial stress.
Inequality in Access to Savings Plans	Leaves low-income individuals vulnerable to both healthcare and retirement risks.

Table 2: Comparison of Healthcare and Retirement Coverage Models in Different Countries

Country	Healthcare Model	Retirement Model	Key Features
Sweden	Universal public healthcare (free)	Public pension (funded through taxes)	Comprehensive coverage for all citizens, including long-term care.
United States	Private healthcare (insurance-based)	401(k), Social Security, personal savings	Fragmented system with significant gaps in coverage, especially for low-income populations.
Germany	Universal healthcare (single-payer)	Statutory pension system and private savings	Universal healthcare with compulsory pension contributions.
United Kingdom	National Health Service (NHS)	State Pension and private pensions	State-funded healthcare and social pensions, with additional private options.
India	Public healthcare (limited access)	Limited public pension (not universal)	Fragmented and underfunded healthcare and pension systems, with significant disparities.
Japan	Universal healthcare (public)	Public pension system and private savings	Strong public healthcare and pension schemes, but under strain due to aging population.

Table 3: Factors Contributing to Financial Risks in Retirement and Health for Aging Populations

Factor	Impact on Financial Risk	Suggested Solution/Policy Intervention
Chronic Health Conditions	Increased healthcare costs for long-term treatments	Expand coverage for chronic disease management and long-term care.
Rising Medical Costs	Diminishing retirement savings, reduced disposable income	Introduce integrated health and retirement savings plans.
Underfunded Pension Systems	Increased reliance on personal savings, leading to poverty in old age	Reform pension systems to increase coverage and sustainability.
Long-term Care Needs	Out-of-pocket expenses for home care or nursing facilities	Mandate long-term care insurance as part of retirement planning.
Income Inequality	Lower-income retirees face higher risks of poverty and inadequate healthcare	Develop policies that reduce income inequality through universal retirement and healthcare systems.

Table 4: Projected Growth of Aging Populations and Its Impact on Healthcare and Retirement

Year	Global Population Over 60 (in billions)	Percentage of Global Population	Projected Increase in Healthcare and Retirement Costs
2020	1.1	13.5%	25-30% increase in healthcare costs for aging population
2030	1.4	16.0%	40-45% increase in healthcare and retirement costs
2040	1.9	20.0%	50-60% increase in healthcare and retirement costs
2050	2.5	25.0%	65-75% increase in healthcare and retirement costs

Table 5: Common Chronic Conditions Affecting Older Adults and Their Healthcare Costs

Chronic Condition	Prevalence Among Older Adults (%)	Estimated Annual Healthcare Costs per Person (\$USD)	Impact on Retirement Security
Heart Disease	37%	\$10,000	Significant drain on savings, reduced quality of life.
Diabetes	25%	\$9,500	Increases long-term care costs and hospital visits.
Alzheimer's Disease	12%	\$22,000	Requires extensive care, draining both financial and emotional resources.
Chronic Obstructive Pulmonary Disease (COPD)	15%	\$8,000	Increases emergency healthcare needs and hospitalizations.
Arthritis	30%	\$6,000	Leads to reduced ability to work and increased dependence on healthcare systems.

Table 6: Financial Security Risks in Retirement Based on Income Group

Income Group	Percentage of Population At Risk of Inadequate Retirement Savings	Average Retirement Savings (\$USD)	Likelihood of Healthcare Financial Stress	Recommended Policy Interventions
Low Income	70%	\$10,000	High	Increase access to government-supported retirement plans, expand Medicaid or universal healthcare.
Middle Income	40%	\$50,000	Medium	Provide additional tax incentives for savings, expand access to affordable long-term care insurance.
High Income	10%	\$200,000	Low	Maintain existing systems, offer incentives for higher contributions to private savings.

Table 7: Key Policy Recommendations for Comprehensive Coverage

Policy Recommendation	Expected Impact	Countries or Regions to Implement
Integrated Health and Retirement Savings Accounts	Allows individuals to save for both healthcare and retirement in a single account, reducing financial stress in later years	Developed nations and emerging markets with growing elderly populations
Universal Long-term Care Insurance	Provides financial protection for long-term care needs, reducing out-of-pocket expenses for aging populations	All countries with aging populations, particularly in Europe and Asia
Expanded Social Security and Pension Systems	Ensures that all individuals, especially low-income retirees, have access to a guaranteed income in retirement	Developed and developing countries with underfunded pension schemes
Healthcare Coverage for Chronic Conditions	Reduces healthcare costs associated with chronic diseases, ensuring aging populations receive adequate medical care	Countries with high prevalence of chronic diseases in elderly populations, such as the US, UK, and Japan
Health Education and Financial Literacy Programs	Increases awareness of financial planning for retirement and healthcare costs, leading to better savings habits	Worldwide, especially in countries with low financial literacy rates

Conclusion

The convergence of increasing life expectancy, rising healthcare costs, and inadequate retirement preparedness has positioned emerging health and retirement risks as one of the most urgent socio-economic challenges of our time. As populations age—especially across developing and emerging

economies—the strain on both public and private systems grows more acute. This study reaffirms that the separation of healthcare planning from retirement savings is no longer viable. The two are fundamentally interconnected, and the failure to address them jointly has resulted in increasing financial insecurity for older adults, particularly in low- and middle-income populations.

The evidence from both primary interviews and cross-national case studies reveals a clear pattern: **chronic diseases** such as diabetes, cardiovascular conditions, and neurodegenerative disorders significantly increase out-of-pocket healthcare expenses, which, in turn, rapidly deplete limited retirement savings. In India, for instance, retirees reported spending upwards

of ₹2 lakhs annually on healthcare without the support of comprehensive insurance. With only **12% of the Indian workforce enrolled in formal pension systems**, the financial burden falls disproportionately on families, often pushing entire households into long-term debt or poverty. Such vulnerabilities are magnified in countries with underfunded pension schemes, limited healthcare access, and no long-term care infrastructure.

Retirement systems around the world are failing to keep pace with demographic transitions. While global life expectancy has increased significantly, retirement readiness has not kept up. According to the **OECD (2021)**, a substantial proportion of the population in developed countries is at risk of outliving their retirement funds, and in developing nations, retirement coverage is fragmented and inaccessible to the informal sector. Moreover, **financial inequality exacerbates this gap**—wealthier individuals benefit from tax-deferred savings schemes and private insurance, while lower-income individuals are left with limited or no options for financial security in old age.

In this context, **integrated systems** that combine health insurance, long-term care, and retirement savings into a unified structure represent a critical pathway forward. Countries like Sweden, Norway, and Japan have demonstrated the feasibility and benefits of such approaches, offering universal coverage that

reduces disparities and promotes social equity. For example, **Japan's mandatory long-term care insurance** covers a wide spectrum of eldercare services, reducing dependence on family caregivers and protecting savings. **Sweden's tax-funded model** ensures basic income and healthcare access for all retirees, regardless of employment history.

For India and similarly positioned economies, this study strongly recommends the introduction of **Integrated Health and Retirement Accounts (IHRAs)**, which allow individuals to accumulate funds for both healthcare and post-retirement living costs. These accounts should be supported through joint contributions by employers, employees, and the government, with **built-in provisions for long-term care** and incentives for consistent savings. Such reforms should be complemented by **targeted financial literacy programs**, as many interviewees in this study cited a lack of awareness and guidance as barriers to early and adequate financial planning.

Equally important is the expansion of public funding for **long-term care services**, which remains a major gap in most health insurance schemes. Home-based care, assisted living, and nursing facilities must be formally integrated into national health strategies. Without such coverage, the economic toll of aging will increasingly fall on families, particularly women, who often serve as unpaid caregivers.

The political and financial challenges of implementing such systemic reforms are significant, especially in resource-constrained settings. However, the cost of inaction is far greater. Without proactive, integrated reforms, aging populations will face rising poverty, worsening health outcomes, and deepening inequality. The path forward must include **cross-sectoral collaboration, international knowledge sharing, and innovative financing models**, including social bonds and public-private partnerships that can sustainably support aging populations.

In conclusion, the rising health and retirement risks confronting modern societies demand a **holistic, inclusive, and future-proofed policy response**. The time has come to transition from fragmented, reactive approaches to **integrated, preventive systems** that treat healthcare and financial security as two sides of the same coin. Only by embedding comprehensive protection mechanisms within both public and private institutions can we ensure that aging is not a source of hardship but a phase of life lived with dignity, stability, and wellbeing. As demographic trends accelerate, the decisions made today will define the quality of life for millions of older adults tomorrow. **II**

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Securing Futures: Innovating Health and Retirement Insurance for a Better Tomorrow



Dr. Naman Agrawal

naman.niti@gmail.com

Naman Kumar Agrawal is a multifaceted professional, holding degrees in Electrical and Electronics Engineering, Finance, HR, and a Ph.D. in Management. With a keen focus on technology commercialization and startup ecosystem management, Naman has played a pivotal role in enhancing India's science, technology, and innovation landscape. His scholarly contributions include over 30 academic and research articles published in esteemed journals, books, and popular science magazines.

Securing the future of India's 1.4+ billion people means ensuring two fundamental aspects of well-being: good health throughout life, and dignity in old age. As life expectancies rise and lifestyles change, health risks and longevity risks grow in tandem. At the same time, the tools to manage these risks — from digital health platforms to innovative pension schemes — are more powerful than ever. For insurance professionals and policymakers, the challenge is to **harness innovation** so that Indian families are protected from sickness bills and retirees can live securely. This comprehensive review explores the current landscape of health and retirement insurance in India, highlighting new facts, technological advances, and policy initiatives. It aims to inspire and inform stakeholders about how to build a better tomorrow where no family is bankrupted by illness and every senior can retire with dignity.

The Health Insurance Imperative

India faces a **dual health burden**: persistent infectious diseases and a rapidly rising tide of chronic, non-communicable illnesses (NCDs) such as diabetes, heart disease, and cancer. Today over 60% of deaths in India are due to NCDs. At the same time, **medical costs are soaring**. An independent index found that healthcare costs in India increased at about **14% per year** in 2023 — one of the highest rates in Asia. In rural and urban India alike, this inflation drives up insurance premiums and out-of-pocket spending.

Yet despite rising risks, **health insurance coverage** remains low. Industry analysis shows health insurance premiums grew 17.8% in 2023, but penetration is still under 1% of GDP. Over **62% of healthcare expenses** are paid directly by households, and about 23% of hospital bills are financed through borrowing. In practical terms, a

serious illness can easily push a family into debt or poverty. These facts underscore why expanding insurance is an **urgent social priority**: insurance pays for care that families otherwise cannot afford, preventing medical impoverishment.

Recognizing this, the government has launched bold health insurance initiatives. The flagship **Ayushman Bharat – PM-JAY** program (launched 2018) provides up to **₹5 lakh per family per year** for secondary and tertiary care. (This coverage includes treatment at empaneled public or private hospitals.) By 2024, PM-JAY covers tens of millions of low-income Indian families. In late 2024, the Union Cabinet approved a major expansion: *every* senior citizen aged 70 and above will now be covered by PM-JAY, regardless of income. This move extends free coverage to an additional ~4.5 crore families (about 6 crore senior individuals). Millions of cards will be reissued with higher top-up benefits, reflecting the

government's push toward universal coverage.

These government schemes address only part of the gap. Private insurers and employers also play a crucial role: group health policies (common in medium and large companies) cover tens of millions of employees. *Supplemental* top-up and critical-illness plans are increasingly sold to middle-income families. But to truly secure the future, India needs both strong public programs and a thriving private market.

Innovation in Health Insurance

Meeting India's health challenges requires **innovation at multiple levels** — in technology, products, and policy. A few key trends illustrate the transformation underway:

- **Digital Health and Telemedicine:** India's digital revolution is a powerful enabler. By 2024, about **751 million Indians (52.4% of the population)** were using the Internet, and there were **1.12 billion active mobile connections** (78% of the population). These platforms are being leveraged for health: the government's free national telemedicine service *eSanjeevani* has already delivered **over 276 million remote consultations**, greatly improving access for rural and underserved patients. Electronic health record initiatives are also expanding: as of December 2024, over **71.16**

crore (711.6 million) unique digital health IDs (ABHAs) have been created, linking about **45.99 crore** (459.9 million) medical records. In sum, the foundations of a nationwide digital health network are coming together, which insurers can tap for efficient enrollment, claims processing, and wellness programs.

- **Regulatory and Product Innovation:** The Insurance Regulatory and Development Authority (IRDAI) is pushing reforms to increase penetration. For example, from April 2024 IRDAI **removed the age cap of 65** on purchasing health policies. Insurers must now issue new policies even to seniors and to people with serious pre-existing conditions (cancer, heart or renal failure, etc.). This change opens up coverage to a high-risk but vulnerable segment. IRDAI is also encouraging insurers to design age- and lifestyle-specific products (for children, students, mothers, senior citizens, etc.). Additionally, the government has proposed **composite licenses** that would allow one company to sell life, general, and health insurance under a single umbrella. This could let life insurers cross-sell health plans using their existing customer data, and vice versa, leading to more comprehensive protection for customers.

- **Technology-driven Underwriting and Service:** Insurtech is transforming how insurance is delivered. Many insurers now use advanced data analytics and machine learning to **tailor risk profiles and pricing**. AI-powered chatbots and virtual assistants handle customer queries around the clock, while smartphone apps facilitate policy purchase and claims submission. Wearable health devices (smart bands, fitness trackers) and digital health records can feed real-time data to insurers, enabling *usage-based* or *preventive* insurance models. For example, an insurer might offer a premium discount to policyholders who maintain healthy blood pressure or activity levels, as measured by a smartwatch. Predictive models also flag fraudulent claims early. As a recent industry analysis notes, "AI and machine learning models have streamlined underwriting, allowing insurers to tailor products to customer risk profiles," and these tools are improving efficiency at every stage.

These innovations are already bearing fruit. After the COVID-19 shock, Indian health insurance is in rapid growth mode: **premiums grew by 17.8% in 2023**. GlobalData forecasts the health insurance market will reach **₹2.0 trillion (US\$23.8 billion) by 2028**, up from ₹1.3 trillion (US\$15.1 billion) in 2024. The share of health

insurance in the overall insurance industry has climbed from 6.9% in 2019 to **9.5% by 2023**, with expectations to hit 11% by 2028. Factors driving this surge include rising out-of-pocket healthcare costs, growing lifestyle-disease awareness, regulatory reforms, and easier access via digital platforms. Notably, insurers of all sizes are adopting disruptive technologies to expand reach: AI-powered customer segmentation, instant online policy issuance, and digital payment gateways are making it simpler for a shopkeeper in a small town or a rural farm family to buy insurance. All of these trends paint an encouraging picture: more Indians are getting insured, and insurers are finding new ways to serve them.

The Retirement Security Challenge

Securing futures also means **securing old age**. India's demographic landscape is shifting fast. Today only about 7% of the population is 65 or older, but that share is expected to double to **14% by 2050**. In raw numbers, India will add roughly **144 million people aged 65+** by the mid-2050s – almost equivalent to Russia's current population. By then, the number of elderly Indians will exceed those under 15. This "silver tsunami" presents both social and economic challenges: more families will need a steady income even when traditional jobs have long ended, and healthcare needs will grow. At the same time, fertility rates are falling (just under

replacement level), and longer lifespans (average life expectancy is 72.3 years) mean retirement can last 15–20 years or more.

Historically, however, **formal pension coverage** in India has been limited.

The majority of workers – farmers, traders, construction workers, and home-based laborers – have no regular pension plan. In the private sector, many rely on the **Employees' Provident Fund (EPF)**, which is primarily a lump-sum savings scheme (employee and employer each contribute ~12% of salary) that a retiree withdraws, often leaving only a small monthly pension (the Employees' Pension Scheme) at age 58. Public pension spending is relatively modest: OECD data shows India's public pension outlays are only **7.7% of GDP** (well below the 15–18% seen in many developed nations). In practice, without change, a large fraction of the workforce risks growing old without adequate means.

Fortunately, the last decade has seen a paradigm shift. The government has launched major programs to cover the uncovered:

- **Atal Pension Yojana (APY, 2015):** APY guarantees a defined pension (from ₹1,000 to ₹5,000 per month) to subscribers, based on their contributions. It targets unorganized and informal workers who did not have employer pensions. APY's success has been impressive: as of April 2025 it had **7.65 crore subscribers** and a total corpus of ₹45,974.67

crore. Nearly half of these subscribers are women, reflecting strong uptake among rural and low-income women (who often lack other social security). Each APY account builds with yearly contributions (co-contributed by the government for some), and at age 60 the subscriber receives the guaranteed pension for life (with the spouse also eligible for survivor benefits). APY enrollment soared recently – about 1.17 crore new accounts were opened in FY 2024–25 alone. These figures signal that millions who would have otherwise lacked any retirement savings are now protected by a pension.

- **National Pension System (NPS):** Originally launched in 2004 for government employees and opened to all citizens in 2009, NPS is a voluntary defined-contribution scheme that allows individuals (or their employers) to contribute to retirement funds. The accumulated savings can be partially withdrawn at retirement and the rest is used to purchase an annuity (guaranteed pension). NPS too is growing: in FY2024–25, over **12 lakh** new private-sector subscribers joined NPS, pushing the total active accounts to **165 lakh (16.5 million)** by March 2025. Notably, NPS introduced a scheme called "Vatsalya" in late 2024, targeting minors (under age 18) whose parents can save small amounts

for their children's future – this already attracted over 1 lakh subscribers by early 2025. Further, government employees contribute automatically to NPS (for Central and State government workers), so over 3 lakh government schemes are now linked. Combined, the NPS and APY accounts hold assets of ₹14.43 lakh crore (₹14.43 trillion) as of FY2024–25, forming a substantial pension ecosystem. Returns on APY have averaged around 9.1% per annum, which is attractive compared to most bank fixed-deposits, making it a competitive saving option.

These data reveal a deep change: for the first time, **tens of millions of Indians** are systematically saving for retirement. The gender balance in new enrollees is also improving – in FY2024–25, women constituted about **48–55%** of new APY/NPS accounts – suggesting broader family participation in retirement planning. Life insurance companies have joined in too: many now market deferred annuity plans, systematic pension plans, and retirement-focused savings products that complement government schemes. Some insurers offer variants where part of the policy's value can be drawn as life-long pension after surrendering a lump sum at retirement. These new products add flexibility for consumers.

Nonetheless, **coverage gaps remain**. As of 2023, only a fraction of the

workforce (formal and informal) contributes to a pension scheme. Millions of small-scale farmers and self-employed workers still lack any cover. The pensions paid by EPF/ EPS are often modest, and many retirees exhaust their savings quickly. To address this, further outreach and policy refinement are needed – for example, simplifying enrollment, linking pension accounts to bank and Aadhaar, and offering micro-pensions to gig workers and urban poor. The recent OECD *Pensions at a Glance* report emphasizes that with India's ageing, the country must deepen pension coverage to avoid old-age poverty.

Innovation in Retirement and Pensions

Just as in health, innovation in **financial products and delivery** can strengthen retirement security. Key developments include:

- Digital Enrollment and Portability:** Mobile and internet platforms have made it easier to open and manage retirement accounts. NPS provides a 12-digit PRAN (Permanent Retirement Account Number) that works nationwide, and today anyone can sign up online with basic KYC through the pension fund managers. Efforts are underway to further port pension accounts: for example, linking NPS and APY with India's digital locker (DigiLocker) or other e-governance IDs, so that a worker changing jobs or
- Data-Driven Retirement Advice and Annuities:** Fintech companies and insurers are increasingly offering tools to help individuals plan retirement. For instance, some mobile apps can project "If you save ₹1000 per month till age 60, your projected pension will be ₹X per month," adjusting for interest rates. Insurers are also developing new annuity products. Traditional annuities (which convert lump sums into a lifelong pension) are being enhanced with options like inflation protection or longevity sharing. There is international interest in **deferred income annuities** (plans that start payouts after a future date) and **variable annuities** (where payouts are linked to investment performance). In India, regulators have allowed life insurers to offer more flexibility in annuities, including guaranteed returns plus market-linked components, which could appeal to risk-averse savers looking for both security and growth.
- Behavioral and Social Nudges:** Behavioral finance ideas are being applied to pensions. APY initially

moving states retains continuous coverage. In future, one can envision an e-KYC flow where a farm laborer walks into a bank or a post office, and in minutes automatically gets her APY account opened on a smartphone app with Aadhaar authentication.

offered income-tax discounts to early subscribers, and employers are now encouraged to enroll employees in NPS by default. Some state governments are running enrollment camps at local banking centers and village councils, using awareness campaigns. SMS reminders about contribution deadlines and tax benefits also encourage sustained saving. The idea is to make saving an almost automatic choice. Research from other countries shows that *default enrollment* dramatically raises participation, so if India can make APY/NPS opt-out rather than opt-in for certain categories of workers, participation could jump further.

- **Inclusive Financial Literacy and Outreach:** The same channels used for consumer education about health insurance can serve pensions. Insurers and NGOs are using video tutorials in regional languages, and even popular messaging apps like WhatsApp, to explain how pensions work. During health insurance drives (say, at a free medical camp), volunteers can also register interested people for basic pension schemes. Banks and Post Offices, which reach remote villages, are integrating financial literacy on retirement saving into their customer interface. Over time, a culture of saving even small amounts regularly can develop, supported by mobile

wallets and ease of digital payment.

The Role of Government, Insurers, and Society

Innovation alone is not enough; **collaboration** is essential. The government provides the regulatory framework and incentives. For example, recent budgets have increased funding for public healthcare infrastructure (which helps insurers by expanding service availability) and have allocated more to rural employment guarantee schemes (raising workers' ability to save). Regulations now require insurers to settle most cashless claims within a few hours, improving trust in the system. The mandatory use of Aadhaar for KYC and the integration of government welfare apps (like for pensions or insurance claims) are administrative innovations that smooth the insurance experience.

Insurance companies themselves must continue to adapt. The IRDAI's push for digital platforms means insurers are investing in e-commerce, robo-advisors, and mobile-native insurance products. Actuaries and underwriters are developing products that suit modern Indian lives – for example, family floater policies that cover children and parents on one card, and micro-policies that can be bought for just a week by migrant workers. Reinsurers (which back insurers' large risks) are helping local insurers offer affordable rates for critical illnesses and cyber-health threats.

Insurers also have a social role. The ethos of "insurance as social good" can motivate them to expand outreach to hard-to-reach segments, even if initially unprofitable. Public sector insurers, which exist alongside private firms, often have mandates to cover rural areas; their experience with schemes like Rashtriya Swasthya Bima Yojana (RSBY) has yielded lessons in reaching the poorest families. Private insurers bring efficiency and marketing prowess; joint ventures between private and state insurers (or tie-ups with big banks/tech firms) can amplify scale.

Civil society and multilateral organizations contribute ideas too. The World Bank and WHO emphasize that Universal Health Coverage (UHC) is within reach if government schemes are expanded and complemented by private insurance. International bodies like the OECD and International Monetary Fund have highlighted the need for Asia's emerging economies to prepare for aging populations; India's NPS/APY model is now often cited as a success story to be studied by other countries. India itself can take inspiration from abroad: Singapore's Central Provident Fund (CPF) or Thailand's Universal Retirement Scheme show how national pensions can be structured, while micro-insurance success stories in Africa demonstrate how technology (like mobile money) can reach the poorest. At the same time, India is innovating uniquely: its combination

of Aadhaar-based IDs, biometric banking, and portable national schemes is unparalleled. Global partners are watching and sometimes collaborating, offering technical assistance or co-funding research.

Finally, **insurer-citizen partnership** is key. Trust must be built: if consumers see insurers settling legitimate claims quickly and honoring commitments (such as paying annuities as promised), take-up will rise. Financial literacy campaigns should demystify insurance jargon. Innovations like “insurance-in-a-box” micro-covers sold by village entrepreneurs can make policies tangible. In short, every stakeholder — from central and state governments to regulators, from insurers to local community groups — must work in concert. When all these gears mesh, India’s insurance ecosystem will operate smoothly.

Looking Ahead: An Inspiring Vision

The coming decades offer an unprecedented opportunity. By some estimates, **half of India’s population will be middle-class** in the next 10 years, leading to greater affordability for insurance. At the same time, technology adoption is skyrocketing: by 2025, India may have well over **800 million smartphone users**. Policymakers, technologists, and insurers can leverage this trend. Imagine a future where a wellness app schedules your health checkups and automatically renews your health plan, or where your pension account app notifies you of optimal annuity

purchase timing. Concrete targets can guide us:

- Achieve **near-universal health coverage**: aim for 100% of families having some form of protection, whether public or private, by 2030. This could mean linking every bank account or Aadhaar ID to at least a basic health insurance plan or health savings account, with subsidies for the poor. The recent decision to cover all seniors 70+ under PM-JAY is a step in this direction. Similar expansions — such as covering more diseases, outpatient care, or preventive wellness programs — could be phased in over time.
- Secure **retirement for all workers**: strive for 100% pension coverage among the working-age population. In practical terms, this means every wage earner (formal or informal) should be automatically enrolled in a savings plan like APY or NPS by, say, age 25. By 2030, tens of millions more from informal sectors could join through kiosks, banking correspondents, and digital platforms. With innovative products (like annuities with partial liquidity), even gig economy workers and traders can build up retirement income streams.
- Leverage **data and AI**: use India’s growing databases (health records, insurance claims, demographic data) to proactively identify uninsured populations and tailor plans. For example, an AI model might find that non-members of any scheme live predominantly in certain districts or industries; targeted outreach can then be deployed. Predictive analytics can also help insurers price micro-policies more accurately, making them viable.
- Foster **preventive health insurance**: shift some focus from merely paying for illness to rewarding wellness. Insurers can partner with tech firms to offer telehealth subscriptions, AI-driven diet and fitness advice, or discounts on health products, thereby reducing claims over the long term. Pay-for-performance healthcare (where hospitals and insurers share savings if patients stay healthy) can also be explored.
- Promote **financial inclusion**: build on financial literacy efforts. Currently only about one-third of Indians own life or health insurance. Concerted campaigns (for example, tying insurance purchases to popular events like cricket matches or melas) can demystify insurance. Schools and workplaces can teach personal finance basics from a young age, so that saving and insuring become ingrained habits. Over time, the mindset should shift: insurance will be seen not as a luxury, but as an essential life planning tool.

The facts and trends are encouraging. Health insurance in India grew by nearly **18% in 2023**, reflecting rising awareness and demand. Pension schemes are adding **tens of millions** of new savers annually. With continued commitment, that growth can be harnessed to achieve inclusive coverage. Indeed, industry experts note that “the rising demand for health insurance can also be attributed to the digitisation efforts of new-age insurers”, highlighting how

innovation feeds positive change. A similar spirit of innovation and reform in pensions — matched with grassroots engagement — can ensure our elders live out their later years in comfort.

In conclusion, **securing futures** means innovating both health and retirement insurance systems. It demands vision, partnership, and empathy. But if government, insurers, professionals and citizens all play

their part, India can transform risk into resilience. The progress of recent years shows that ambitious goals are achievable: expanding schemes to cover the elderly, dramatically growing pension enrollments, and leveraging digital IDs to reach the masses. With commitment and creativity, India’s insurance industry can help realize a healthier, more secure tomorrow for every citizen.



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Maximising Your Future: The Power of Health Savings Accounts in Retirement Planning



Prof. Venkatesh Ganapathy

gvenkatesh69@gmail.com

Venkatesh Ganapathy is presently associated with ICFAI business school where he teaches courses in Marketing and Business Strategy. Venkatesh holds a Fellowship in Insurance from III. He has several publications in national and international journals to his credit.

Introduction

Rising healthcare costs in India, with a 14% medical inflation rate in 2021, have made health insurance insufficient for covering medical expenses. Many individuals face barriers like high premiums and the complexity of insurance products. Health Savings Accounts (HSAs) offer a solution by allowing users to build a medical expense corpus, providing tax advantages and higher interest rates than regular savings accounts. These accounts bridge the gap left by traditional insurance plans, offering more flexibility. As health insurance penetration remains low, HSAs could significantly improve financial preparedness for healthcare needs in India.

A Health Savings Account (HSA) is a tax-advantaged savings account designed to help individuals save for medical expenses while lowering taxable earnings. It combines health and investment concepts, allowing users to deposit funds that grow over time. A Health Savings Account (HSA) allows individuals to save money tax-free for medical expenses,

reducing taxable earnings. The funds can be used at any time for medical emergencies, but non-medical withdrawals incur a 20% tax and penalty if under 65. Once over 65, the funds can be used for any purpose without penalty.

HSAs are a relatively new concept in India, offering a dual benefit: providing funds for medical emergencies and earning returns on investments. The money in the HSA can be used for doctor appointments, prescribed medications, and other healthcare-related costs. However, using the funds for non-medical purposes results in fines and income tax penalties, making it essential to follow the rules. HSAs are only offered by some banks. For this reason, only a few organisations provide the service of opening a health savings account: **IDFC First Bank** offers interest at a rate of around 5% and the option of getting health cover of up to ₹10 lakhs. The minimum balance requirement for maintaining a health savings account status will range between ₹24,000 and ₹26,000.

FEDO, a start-up in Bangalore,

provides excellent returns on your savings and a pre-approved line of credit for health emergencies to those who have an excellent FEDO score.

Eligibility to open an HSA in India includes being a permanent resident aged 21-55, with either an existing savings account or employer recommendation. The process is simple, either online or offline, with required documents like proof of address, PAN, Aadhaar, and a passport-sized photo.

As healthcare costs continue to rise in India, many individuals are left with the burden of paying for out-of-pocket expenses not covered by traditional health insurance. While health insurance plans help cover hospitalisation costs, they often fall short when it comes to covering outpatient care, diagnostic tests, and daily healthcare needs. The introduction of Health Savings Accounts (HSAs) in India can provide a much-needed solution by offering a financial cushion for such expenses. By saving for medical costs in

advance, individuals can avoid financial distress during times of illness, ensuring they receive the care they need without jeopardising their financial well-being.

Additionally, as India faces a growing elderly population, the need for a sustainable healthcare savings plan is more urgent than ever. Medical expenses often increase with age, especially for chronic conditions, surgeries, and long-term care. HSAs can address this need by allowing individuals to build a healthcare fund over time. The tax advantages of HSAs, including tax-free growth and withdrawals for medical expenses, provide a clear incentive for people to prioritise long-term savings. This makes HSAs not only a useful tool for current medical needs but also a crucial component of retirement planning for healthcare expenses.

The introduction of HSAs in India can also encourage a shift toward preventive healthcare. By saving money for health-related costs, individuals may become more proactive about managing their health and reducing future medical expenses. The ability to withdraw funds for wellness activities, regular check-ups, and early treatments could lead to healthier lifestyles and fewer major health crises down the road. This shift could ultimately alleviate the pressure on India's healthcare system and improve overall public health outcomes.

History of HSAs

Health Savings Accounts (HSAs) were introduced in the United

States as part of the Medicare Prescription Drug, Improvement, and Modernisation Act of 2003. This Act, signed into law by President George W. Bush, allowed individuals to open tax-advantaged savings accounts to pay for qualified medical expenses. The primary aim of HSAs was to encourage people to take more responsibility for their healthcare costs and promote savings for medical emergencies.

The concept behind HSAs was to pair them with **high-deductible health Plans (HDHPs)**, which typically have lower premiums but higher deductibles. By combining the two, individuals could save money in an HSA tax-free, which could be used to cover the out-of-pocket costs associated with the HDHP. These funds could be used for a wide range of medical expenses, including hospital visits, prescription medications, and even dental or vision care.

In the U.S., HSAs are linked to high-deductible health plans (HDHPs) to encourage consumers to spend more thoughtfully on healthcare by giving them more financial responsibility upfront. This linkage promotes cost-conscious behaviour and helps control rising healthcare costs. HSAs offer tax benefits to offset the higher deductible burden. It's not a standalone account to prevent misuse for general savings rather than health expenses.

HSAs quickly became popular as they offered a way for individuals to save for future healthcare needs, with the

added benefit of tax savings. Over time, the scope of eligible expenses expanded, and people began using HSAs not only for current medical needs but also for long-term health savings, especially post-retirement.

In India, while the concept of HSAs is relatively new, there have been discussions and emerging models like **Health Savings Accounts** linked with HDHPs, similar to the U.S. system, as a means to provide more comprehensive healthcare coverage for its growing population.

Benefits of Health Savings Account

A Health Savings Account (HSA) is a personal savings account designed to help individuals save for unexpected medical expenses without affecting regular savings. Contributions can be made by the account holder, employer, or family members. HSAs offer higher interest rates compared to regular savings accounts and often include investment options for better returns. Qualified medical, dental, and vision expenses can be covered by HSA funds.

Benefits of an HSA include tax reduction, lower medical expenses, tax-free interest, rollover of unused funds, and control over spending. After 65, funds can be used freely, and the account remains tax-exempt. An HSA provides a flexible and strategic way to manage healthcare costs while saving for the future.

Withdrawals for qualified medical expenses are tax-free, and family members covered by your taxes can

also benefit from the account. Unlike other accounts, HSA funds do not require minimum distributions and can roll over year after year, allowing continued growth. HSAs are often employer-sponsored, but individuals can open them too, with contributions invested in diverse asset classes like stocks and bonds. This diversification can help build wealth over time.

In India, some banks, like IDFC First Bank and FEDO, offer HSAs. Benefits include no expiry, flexible withdrawals for medical expenses, higher interest, post-retirement access, and control over savings. Funds also carry forward to the next year, supporting long-term savings for health-related needs.

An HSA (Health Savings Account) in the U.S. typically earns more than a regular savings bank account, but it depends on how the funds are managed:

- **Cash Portion:** If kept in the HSA's basic cash account, the interest is often slightly higher than a standard savings account, but still modest (around 0.5%–2% APY, depending on the provider).
- **Investment Option:** Many HSAs allow you to invest the balance in mutual funds or ETFs, similar to a 401(k) or IRA, which can offer higher returns over time.

In India, since there is no official Health Savings Account (HSA) framework like in the U.S., there are no standardised interest rates tied to such accounts.

Why India Needs a HAS

A joint study by FICCI and KPMG highlighted critical gaps in India's healthcare sector, revealing that only 27% of the population has access to quality healthcare, and most are only covered for hospitalisation. Out-of-pocket costs for outpatient treatments, diagnostic consultations, and other medical expenses are a burden for many. With a 14% increase in medical inflation, the study emphasised the need for a comprehensive solution that combines savings and insurance. The Health Savings Account (HSA) scheme, paired with a high-deductible health plan (HDHP), was recommended as the ideal model to address these gaps and offer a sustainable healthcare solution for all.

In light of health crises like the COVID-19 pandemic, an HSA helps save for medical emergencies, covering expenses beyond hospitalisations, such as wellness, OPD visits, and pharmaceuticals. It also offers a smart investment opportunity for future needs. Similar to pension plans, HSAs help safeguard against financial stress caused by unforeseen medical expenses.

Moreover, the increasing burden of medical expenses, coupled with the rise in chronic health conditions in India, necessitates a proactive approach to healthcare financing. With the country's young working population, creating a culture of saving for health through HSAs can ensure that individuals are better

prepared for future healthcare needs. By combining savings with tax benefits, an HSA offers long-term financial security, reducing dependence on public healthcare services or costly emergency loans. The scheme not only helps individuals manage their healthcare costs but also encourages them to take more responsibility for their health.

Furthermore, as India's healthcare system moves towards more private healthcare providers, individuals will increasingly face high out-of-pocket expenses, even with insurance. This makes HSAs an effective tool to complement existing insurance plans. With rising medical inflation and limited coverage from conventional health insurance, an HSA can serve as a crucial financial buffer. In this context, integrating HSAs into the Indian healthcare system offers a sustainable model that can address both present healthcare expenses and future financial stability.

Limitations of HSAs

One of the primary limitations of Health Savings Accounts (HSAs) is that they are only available to individuals enrolled in high-deductible health plans (HDHPs). This means that if you have a traditional health insurance plan or one with lower deductibles, you are not eligible to open or contribute to an HSA. Additionally, there are age restrictions in some countries and limits on who can contribute to the account. In some regions, only individuals under a certain age or specific employment conditions are eligible, which limits

its accessibility for a broader range of individuals.

HSAs also come with contribution limits, which may be restrictive for some individuals who wish to save more for future medical expenses. The annual contribution limits, set by regulatory bodies, can feel limiting if an individual anticipates significant medical costs. Furthermore, any non-medical withdrawals from the HSA before the age of 65 are subject to both a penalty (often 20%) and income tax. This restriction discourages some individuals from accessing the funds for non-medical emergencies or financial flexibility, which could be a drawback for those who need access to their savings for unexpected life events.

HSAs can be complex to manage for individuals unfamiliar with the investment or tax implications. While the funds grow tax-free and can be used for medical expenses, many people are unaware of how to best invest their HSA funds to maximise growth. Investment options may be limited, or individuals may not understand how to balance healthcare spending with long-term investment growth. Additionally, navigating the rules around eligible medical expenses and keeping track of all receipts and claims can be cumbersome, making the account harder to utilise efficiently without proper understanding and discipline.

HSAs for marginalised sections of society

Health Savings Accounts (HSAs) have the potential to benefit

marginalised sections of society in India, but their accessibility and usefulness depend on several factors. HSAs can offer a new way to save for medical expenses, particularly for those who might not have access to traditional health insurance. Since medical costs are rising rapidly, especially for the underprivileged, an HSA could provide a much-needed financial cushion for medical emergencies. If designed with low minimum balance requirements and linked to affordable high-deductible health plans (HDHPs), HSAs could make healthcare more affordable and reduce the financial strain of out-of-pocket expenses. Additionally, HSAs provide tax savings, which can help individuals from lower-income groups save more for healthcare.

However, there are barriers to entry for marginalised communities. First, HSAs require an individual to have access to a high-deductible health plan, which may not be accessible or affordable for those in lower-income brackets or rural areas. The concept of HSAs also requires financial literacy, and many marginalised individuals may not be aware of or understand how to use such accounts effectively. Furthermore, the requirement for a minimum balance to open or maintain an HSA could be a significant hurdle, especially for economically disadvantaged people who struggle with basic savings.

To make HSAs more inclusive for marginalised communities, the Indian government and insurers would need to design policies that address these challenges. They could

introduce lower minimum balance requirements, partner with employers to offer employer-sponsored HSAs, and invest in awareness campaigns and financial literacy programs. Additionally, creating subsidies or providing government-backed HSAs could ensure that individuals from all economic backgrounds can access and benefit from these accounts. With these steps, HSAs could become a useful tool for improving healthcare access for marginalised populations in India.

Observations and Suggestions

Both HSAs and health insurance products possess their respective advantages, fulfilling different needs, which makes it difficult to depend on one as a substitute for the other. The most cost-effective option is the balance of both extremes for healthcare insurance. While health insurance ensures that one has access to an appropriate level of care in hospitals, an HSA takes care of additional expenditures out-of-pocket, such as outpatient care and diagnosis services. This approach guarantees that both foreseen and unforeseen medical expenses will be accounted for, which makes it easier to manage health expenses.

It is reassuring to note that the healthcare sector in India is proactively working through research and surveys in an effort to solve the problem of accessibility and availability of quality healthcare. For improving quality of life, there are other stakeholders such as the government, the insurers and the

regulators working together to on better facilities and more affordable, effective health products. One such unique idea includes a Health Savings Account (HSA), which can mitigate the long-term issues when partnered with a high-deductible health plan, ensuring that every citizen gets the required attention without financial hurdles.

Government policies play a crucial role in encouraging the growth of Health Savings Accounts. In India, the government could introduce tax breaks or incentives for both individuals and businesses that contribute to HSAs. For example, extending tax exemptions on HSA contributions or providing tax deductions for employer contributions could motivate both employers and employees to use these accounts more regularly. Additionally, making HSAs more appealing through regulatory frameworks that ensure portability (so users can keep their HSAs even when switching jobs) could help retain long-term savings.

With India's growing adoption of digital payments and mobile apps, integrating HSAs into these platforms can make it much easier for consumers to manage their health savings. Insurers can partner with fintech companies to create digital wallets or apps that track both health expenses and HSA balances. This could make it easier for individuals to see their savings grow, track medical spending, and make withdrawals seamlessly. Even remote healthcare services could be integrated into these apps to make healthcare

more accessible while ensuring that HSA users get the most out of their accounts.

Employers can play a pivotal role in accelerating the adoption of HSAs. By offering HSA-linked health plans as part of their employee benefits packages, companies can encourage employees to start saving for future healthcare costs. Employers could even match employee contributions up to a certain limit, similar to how some retirement savings programs work. This would incentivise employees to contribute more to their HSAs and help them manage future medical expenses.

One of the major hurdles is that many Indians are not familiar with the concept of Health Savings Accounts. Even though HSAs are common in countries like the U.S., they are relatively new in India, so there might be resistance due to a lack of awareness. Many people may not fully understand how HSAs work, the tax benefits, or how they can combine them with their healthcare plans.

Insurers need to invest in widespread public education campaigns. This could involve digital marketing, awareness programs, and collaborations with healthcare providers and employers. Simplified communication (videos, infographics, etc.) that outlines the benefits and mechanics of HSAs can help demystify the concept for the average person.

In India, traditional health insurance plans that cover medical emergencies

or major healthcare costs are more widely accepted than savings-based plans. There's also a tendency to focus on immediate medical needs rather than future savings, and many individuals may not see the long-term value of contributing to an HSA.

Insurers could work to change this mindset by emphasising the long-term security that an HSA can offer. Additionally, promoting the idea that an HSA is not just for emergency expenses but also as a smart investment for health-related costs in the future could resonate with consumers. Real-life examples and success stories from other countries could help illustrate the concept.

India's healthcare system is fragmented, with a mixture of private and public healthcare providers and varying quality levels. Integrating HSAs with the existing system, especially for those who rely on government-funded healthcare, could be a challenge.

To tackle this, insurers could focus on partnerships with private healthcare providers and doctors who accept HSA-linked payments. Over time, insurers could work with the government to promote a more integrated, standardised approach to healthcare payments, possibly creating a network where people can use their HSAs for both private and public healthcare.

The Indian insurance sector is heavily regulated, and any new financial product or service must align with existing regulations. There are potential challenges in terms of

introducing tax incentives or ensuring that the regulatory framework for HSAs supports both individuals and insurers.

Working closely with regulators to create a balanced regulatory framework that supports HSAs is key. This could include advocating for specific laws that provide tax benefits, or even collaborating on pilot projects that test the feasibility of HSAs in India. Close collaboration with financial regulators could also streamline the integration of HSAs with existing insurance products.

While India's digital landscape is rapidly expanding, a significant portion of the population still lacks access to smartphones, internet connectivity, and digital literacy. For HSAs to be fully successful, digital platforms and apps need to be user-friendly and accessible to all demographics.

Insurers could develop multi-channel approaches, ensuring that individuals who don't have easy access to digital platforms can still open and manage HSAs through physical branches or agents. Mobile-friendly platforms can be designed to be lightweight and accessible even on basic smartphones or feature phones, ensuring that no one is left behind.

High-deductible health plans (HDHPs), which are typically paired with HSAs, may not be suitable for everyone, particularly those in lower income brackets or those with chronic health conditions. If people perceive HDHPs as too costly upfront, they may avoid enrolling in

HSA-linked plans altogether. Insurers could offer flexible premium options or tiered plans where individuals can choose a more affordable option. Additionally, creating hybrid models that combine affordable premiums with the option to contribute to an HSA could make it easier for people to adopt this approach without feeling financially burdened. By addressing these challenges proactively, insurers can create a more conducive environment for HSAs to flourish in India, ultimately enabling individuals to take greater control of their healthcare expenses and savings.

Hybrid HAS- Health Insurance Model

In India, health insurance companies and banks can collaborate to offer a hybrid product where the bank provides a dedicated health savings account and the insurer offers health coverage, creating a bundled service similar to HSAs in the U.S. This can work through a **Bancassurance model**, where banks distribute insurance products and also manage linked savings accounts. Regulatory clarity from **IRDAI** (for insurers) and **RBI** (for banks) would be essential to define tax treatment, account structure, and permissible investment options. Such a model could promote preventive savings for healthcare while offering insurance protection, especially if incentivised through tax benefits or health-related rewards.

1. Strategic Partnership

- A **bank and a health insurance company** form a formal tie-up under the **Bancassurance model**.

- They co-develop a **hybrid product**: a savings account + health insurance bundle.

2. Product Design

- The **bank** offers a specially tagged **Health Savings Account (HSA)** with features like:
 - o Higher interest or health-linked incentives
 - o Auto-debit for insurance premiums and healthcare expenses
- The **insurer** provides a **customized health insurance policy**, possibly with a **high deductible** to lower premium cost.

3. Customer Enrollment

- Customers open the HSA through the bank and opt into the linked health policy.
- The bank can offer this through its digital platform or branches, making access easy.

4. Funding the Account

- Customers deposit funds into the HSA voluntarily, or via monthly auto-debits (e.g., ₹ 2,000/month).
- These funds are used to pay:
 - o Small medical expenses (outpatient, medicines)
 - o Health insurance premiums
 - o Future medical costs, especially before deductible limits are reached

5. Spending & Claims

- Minor healthcare expenses are paid directly from the HSA (using a debit card or UPI linked to the health wallet).
- Larger expenses are covered under the **insurance policy** once deductibles are met.

6. Taxation & Benefits

- If the government allows, deposits into the HSA could be made **eligible for tax deduction** under **Section 80D**, incentivizing savings.
- The government or insurers may add **wellness rewards**, discounts, or top-ups for preventive health activities.

7. Oversight & Regulation

- The **RBI** regulates the banking side (HSA structure, interest, KYC, etc.).
- The **IRDAI** oversees the insurance part (policy terms, disclosures, grievance redressal).

This model promotes disciplined savings for health expenses, reduces pressure on insurance claims, and empowers customers with greater financial control over their healthcare needs—all while leveraging existing infrastructure in banks and insurers.

Conclusion

Health Savings Accounts (HSAs) represent a transformative financial product with the potential to reshape the landscape of healthcare in India. As the country faces escalating healthcare costs, a low health

insurance penetration rate, and an increasing burden of out-of-pocket medical expenses, HSAs offer a viable solution that combines the best aspects of savings and investment with the specific need for financial preparedness in the face of medical emergencies.

The rise in medical inflation, which has reached a staggering 14% in recent years, has highlighted the inadequacy of traditional health insurance products in meeting the full spectrum of healthcare needs. While health insurance primarily covers hospitalisation costs, many essential services such as outpatient visits, diagnostics, and medications remain uncovered. This gap has left many individuals to pay for these expenses out of their own pockets, leading to financial strain and, in some cases, the delay of necessary treatments. HSAs can bridge this gap by allowing individuals to save specifically for these out-of-pocket medical expenses, providing them with the financial flexibility to access a wide range of healthcare services beyond hospitalisation.

One of the key advantages of HSAs is their ability to offer tax benefits. Contributions to an HSA are tax-deductible, reducing an individual's taxable income, and the funds within the account grow tax-free. This makes them an effective way for individuals to not only save for medical emergencies but also to reduce their overall tax liability. Moreover, the funds in an HSA are not subject to the usual limitations or time constraints that apply to other

forms of savings accounts. They roll over year after year, accumulating interest and growing as the individual continues to save. This feature also addresses the need for long-term healthcare savings, particularly for retirement, when the cost of medical care is likely to rise.

Furthermore, HSAs offer flexibility in their usage. The funds in an HSA can be used for a wide range of medical expenses, including those not covered by traditional insurance plans. This gives account holders greater control over their healthcare spending and enables them to prepare for unforeseen medical needs. For those who are under 65, withdrawals for non-medical reasons are subject to penalties and taxes, but once an individual reaches the age of 65, the funds can be used for any purpose without penalty. This feature offers an added layer of security for individuals planning for retirement, allowing them to use the funds for healthcare or other purposes in their later years.

Despite their many benefits, the adoption of HSAs in India remains relatively low, primarily due to the novelty of the product and a lack of awareness. The government, insurance providers, and financial institutions need to collaborate to raise awareness and provide incentives for individuals to open and maintain these accounts. Moreover, efforts should be made to make HSAs more accessible to marginalized sections of society, ensuring that they too have the opportunity to benefit from this innovative financial tool.

Ultimately, HSAs can complement traditional health insurance plans, offering individuals a comprehensive solution for both short-term medical expenses and long-term healthcare savings. In a country like India, where access to quality healthcare remains limited for many, the introduction and expansion of HSAs can play a critical role in improving financial preparedness, reducing the financial burden of healthcare, and promoting better health outcomes. By empowering individuals to take control of their healthcare finances, HSAs have the potential to become a cornerstone of India's healthcare infrastructure, supporting not only the health and well-being of the population but also the long-term sustainability of the country's healthcare system.

The concept of Health Savings Accounts (HSAs) also aligns with India's growing trend of financial literacy and discipline. As more individuals begin to prioritise savings, an HSA offers a structured and purpose-driven savings mechanism for healthcare. With the rise of awareness around personal finance management, HSAs can teach individuals the importance of setting aside funds specifically for medical expenses, thus fostering a more savings-conscious population. This shift in mindset can help reduce the financial strain caused by sudden medical emergencies, as people will be better prepared to handle unexpected health-related costs.

HSAs can play a complementary role to the government's efforts

to enhance healthcare access through schemes like Ayushman Bharat, which aims to provide health insurance to the economically disadvantaged. While these government programs provide coverage for hospitalisation, and major medical treatments, they often fail to address day-to-day medical expenses such as doctor consultations or outpatient procedures. HSAs can work alongside such initiatives by allowing individuals to fund these uncovered services with pre-tax savings, thus ensuring broader healthcare coverage and improving overall health outcomes.

Another significant advantage of HSAs is that they incentivise individuals to focus on preventive healthcare. Since funds in an HSA can be used for wellness-related expenses, such as routine check-ups, vaccinations, or preventive treatments, it encourages people to proactively manage their health. By directing funds towards maintaining

good health rather than just responding to emergencies, HSAs can help reduce long-term healthcare costs, ultimately leading to a healthier population. This shift towards prevention, supported by the flexibility of HSAs, can also alleviate pressure on India's healthcare system in the long run.

The HSA-health insurance model scores over traditional health insurance schemes by combining preventive savings with financial protection, offering greater flexibility and control to the policyholder. While regular insurance only covers costs after claims and often excludes OPD or small expenses, the HSA allows individuals to save and spend on routine medical needs tax-efficiently. It encourages health-conscious behaviour, reduces over-reliance on insurance claims, and provides a cushion for costs below the deductible limit, making healthcare financing more comprehensive, accessible, and sustainable in the long run. 

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Health Insurance in the Digital Era: Disruption or Transformation?



Dr. Dileep Kumar S. D.

dileepsd87@gmail.com

He is, at present, working as Assistant Professor and Coordinator in the PG Department of Commerce, PES Institute of Advanced Management Studies, Shivamogga (Karnataka State). He took his M.Com Degree in 2011 from the University of Mysore and also cleared UGC-NET in the same year. He has also obtained M.A (Econ) from IGNOU in 2023. Obtained Ph.D Degree from the Kuvempu University in 2020. He has taught Commerce and Management at different levels for about 14 years. So far, he has published more than 40 research papers/articles in the journals of repute, Co-authored 02 books and he has also presented two dozen research papers/articles at different levels of seminars.

Abstract

The health insurance industry in India is undergoing a digital revolution, driven by technological innovation, evolving consumer expectations, and public policy reforms. Integration of AI, blockchain, telemedicine, and digital platforms has transformed traditional insurance models, enhancing accessibility, efficiency, and personalization. However, initiatives like Ayushman Bharat Digital Mission (ABDM) and PM-JAY are enabling inclusive healthcare coverage and real-time service delivery. On the other hand, challenges such as digital divide, data privacy concerns, and infrastructure gaps persist. In this background, the present paper makes an effort to analyze the transformative impact of digital technologies on India's health insurance ecosystem, emphasizing the strategic synergy between innovation, policy, and universal health coverage.

Keywords

Digital Health Insurance, Ayushman Bharat, HealthTech Innovation, Universal Health Coverage (UHC), InsurTech India.

Introduction

The insurance sector, traditionally known for its conservative approach and legacy systems, is undergoing a profound digital transformation. With rapid technological advancements and changing customer expectations, the industry is experiencing unprecedented disruption, reshaping how insurance products are developed, distributed, and consumed. Globally, the digital insurance market is witnessing significant growth. According to a 2024 report by McKinsey & Company, over 60% of new insurance policies across leading economies were purchased through digital channels. In addition, Deloitte's 2023 Global Insurance Outlook revealed that 72% of insurance executives

ranked digital transformation as their top strategic priority, ahead of risk management and regulatory compliance.

In India, the transformation is equally noteworthy. As per the (IRDAI Annual Report 2024), digital channels accounted for nearly 42% of health and life insurance policy sales, up from 26% in 2020. The integration of AI, blockchain, and cloud computing is enabling insurers to automate claims processing, reduce fraud, improve customer personalization, and drive cost efficiency. For instance, ICICI Lombard's AI-powered chatbot "RAISA" reportedly handled over 6 million customer interactions in 2023, significantly reducing turnaround time and enhancing customer satisfaction.

The rationale for studying this transformation lies in the industry's need to stay relevant and competitive. Traditional models are increasingly being challenged by InsurTechs-

agile, tech-driven startups leveraging digital platforms to offer innovative products and real-time customer service. As of 2024, global InsurTech investments reached 8.3 billion US Dollar, signaling investor confidence in technology-led disruption within the sector. However, digital transformation also aligns with the broader macroeconomic goals. In emerging economies like India, digital insurance plays a vital role in advancing financial inclusion and social security. Initiatives such as the PM-JAY scheme and the National Digital Health Mission (NDHM) are accelerating the integration of health data and insurance coverage, offering new opportunities for collaboration between insurers and digital health platforms.

Even, the transformation journey is not without challenges. Data privacy concerns, cyber risks, regulatory bottlenecks, and resistance to change within traditional firms present significant hurdles. Moreover, bridging the digital divide remains crucial to ensure that digital innovation benefits all segments of society, especially in rural and underserved areas. In this background, understanding digital disruption in the insurance industry is essential not only for sustaining competitive advantage but also for aligning the sector with national priorities like financial inclusion, digital governance, and sustainable development. The fusion of insurance and technology is no longer optional, it is a strategic imperative for the industry's evolution in the digital age.

Global Health Insurance Trends: An Overview

The global health insurance industry is undergoing transformative changes, driven by evolving demographics, rising healthcare costs, regulatory reforms, and rapid technological advancements. As of 2024, the global health insurance market was valued at approximately 2.5 trillion US Dollar and is projected to reach 3.4 trillion US Dollar by 2028, growing at a CAGR of 6.5%, according to a report by (Market Research Future). This growth is fueled by increasing awareness of health risks post-COVID-19, aging populations, and expanding government-backed insurance schemes across developing economies. One of the most notable trends is the digitalization of health insurance services. A 2024 McKinsey survey revealed that 58% of policyholders globally prefer managing their health insurance through mobile apps or online portals, compared to just 34% in 2020. The integration of AI-driven underwriting, real-time claims processing, and telehealth services has significantly improved customer experience and operational efficiency. For example, United Health Group reported a 15% increase in digital claims processing accuracy in 2023 due to AI deployment.

Moreover, value-based care models are gaining traction. Instead of traditional fee-for-service reimbursement, insurers are

increasingly aligning with providers to focus on patient outcomes and preventive care. This shift is helping reduce hospitalization rates and control chronic disease management costs, especially in markets like the U.S., Germany, and Australia. Similarly, in emerging economies, government-led initiatives such as India's Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) and China's Basic Medical Insurance (BMI) scheme are expanding coverage to millions, reducing out-of-pocket expenses and improving healthcare access. India alone has issued over 30 crore health cards under AB-PMJAY as of early 2024, demonstrating the impact of public-private partnerships in driving insurance penetration. At the same time, the sector faces critical challenges like escalating medical inflation (averaging 10% annually in emerging markets), regulatory complexities, and disparities in access to insurance, especially among vulnerable populations. Climate change-related health risks and the rise of infectious diseases also demand more resilient and adaptive insurance frameworks.

Health Insurance Growth and Trends in India

The Indian health insurance sector has emerged as a cornerstone of the country's financial and healthcare ecosystems, witnessing robust growth and transformation over the past decade. With rising health awareness, increasing medical

costs, and a supportive regulatory environment, health insurance in India has transitioned from a discretionary product to an essential financial tool for households and businesses alike. Nevertheless, **during the financial year 2023–24**, the health insurance segment accounted for **36.2% of the total non-life insurance premium** collected in India, making it the largest segment within the general insurance industry. The **gross direct premium income** from health insurance stood at almost **Rs. 110,340 crore** in the fiscal year 2023–24, marking a **year-on-year growth of over 21%**, according to data from the Insurance Regulatory and Development Authority of India (IRDAI).

The COVID-19 pandemic acted as a catalyst for increased adoption of health insurance, not only among individuals but also through group health schemes by employers. Initiatives such as **Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)**, **National Health Protection Scheme**, and **IRDAI's Health Insurance Guidelines** have significantly boosted accessibility and trust. The integration of AI, telemedicine, and digital claims processing has simplified customer onboarding and service delivery. Launch of customized policies, OPD coverage, and wellness-linked incentives have attracted a younger demographic.

A major shift is being observed in rural and semi-urban adoption.

Distribution through **Bima Sugam** and other digital aggregator platforms is making insurance accessible beyond metros. With a growing gig economy and startup workforce, group health policies are becoming more comprehensive and employee-centric. Integration of fitness tracking apps and wearable devices in policy frameworks is encouraging a preventive care mindset.

India's health insurance market is projected to grow at a **CAGR of 17.5% from 2024 to 2029**, with expectations to cross **Rs. 2.5 lakh crore** in premium collection by the financial year 2028–29. Private insurers continue to expand their market share, accounting for nearly 50% of health premiums during 2023–24, reflecting consumer preference for value-added services and faster claims processing. While growth is promising, the sector faces hurdles such as low insurance penetration (less than 40% of the population), high out-of-pocket expenditure, and limited awareness in rural belts. Moreover, standardization and pricing transparency remain key areas for improvement.

Pre-Digital/Traditional Health Insurance Models

Before the digital revolution, health insurance in India operated under traditional, largely manual frameworks. These pre-digital models were characterized by paper-based processes, limited product innovation, and low consumer awareness. The focus was primarily

on **hospitalization expenses**, and the distribution channels were dominated by **agents and in-person branch visits**. Some of the important traditional models are identified and followed by a brief analysis of the same.

1) Mediclaim Policy by General Insurance Corporation (GIC) : It was started in 1986.

One of India's earliest health insurance policies. Offered basic hospitalization coverage. Claims were reimbursement-based, and the policyholder had to bear expenses first and then claim with proper documentation. No digital portals; claims and policy renewals were handled manually via agents or insurance offices.

2) Central Government Health Scheme (CGHS): Launched in 1954. Though not insurance in the commercial sense, it functioned as a government-funded traditional health coverage model for central government employees. Beneficiaries had to visit branch for dispensaries or empanelled hospitals and follow bureaucratic procedures for reimbursement.

3) Employees' State Insurance Scheme (ESIS): This scheme was started in 1952. Provided social security and health benefits to workers in the organized sector. Heavily reliant on manual processes for identification, claim submission, and reimbursements. Records were

maintained in physical formats; no real-time tracking or portability existed.

Transforming Health Insurance: Role of Digital Technologies

The Indian health insurance sector is undergoing a paradigm shift, driven by rapid digital transformation. Technology has revolutionized how health insurance is designed, distributed, serviced, and experienced, making it more efficient, transparent, and customer-centric than ever before. From AI-powered underwriting to telehealth integration, digital technologies are redefining the contours of health insurance in India. However, **key areas where digital technologies are transforming health insurance are presented below.**

- 1) **Digital Onboarding & Paperless Policy Issuance:** E-KYC, Aadhaar integration, and digital signatures enable instant, paperless issuance of policies. Mobile apps and web portals allow users to compare, select, and purchase policies online with minimal human intervention. For example, Startups like Policybazaar and Digit Insurance offer a seamless digital purchase experience with no physical documentation required.
- 2) **AI & Data Analytics in Underwriting:** Artificial Intelligence (AI) is used to assess health risks based on

medical history, lifestyle data, and past claims. Predictive analytics helps insurers offer customized premiums and detect potential fraud. For example, Niva Bupa Health Insurance uses AI to personalize premium rates and assess risks more accurately.

- 3) **Telemedicine & Virtual Healthcare Integration:** Health insurance policies now integrate teleconsultations, online pharmacy access, and digital health tracking. This reduces the dependency on hospital visits and promotes preventive healthcare. Insurers like Star Health and HDFC ERGO offer telehealth services bundled with their policies for 24/7 doctor consultations.
- 4) **Cashless & Real-Time Claims Processing:** Digitally connected hospitals and TPAs (Third Party Administrators) enable real-time claim approvals and cashless hospitalization. Use of mobile apps for uploading bills, tracking

claims, and receiving settlement status enhances transparency. ICICI Lombard’s IL TakeCare app allows policyholders to submit claims digitally, track progress, and get instant support.

- 5) **Wearable Integration and Wellness Incentives:** Integration with wearables like fitness bands allows insurers to track users’ physical activity. Many policies offer discounts on premiums or rewards for maintaining healthy habits. Aditya Birla Health Insurance offers a “Health Returns” program, where customers earn points based on their activity levels.
- 6) **Chatbots and 24/7 Customer Support:** AI-powered chatbots provide real-time support, assist in claim queries, and answer policy-related questions. Reduces call center load and improves response time. For example, Tata AIG and Max Bupa use chatbots for customer engagement across their websites and mobile apps.

Table 1: Impact of Digital Tranformation on Health Insurance

Aspect/Factor	Pre-Digital Era	Post-Digital Era
Policy Issuance	Manual, days to process	Instant, paperless
Claims Settlement	Tedious and slow	Real-time, app-based
Accessibility	Limited to agents & branches	Online, mobile, telehealthaccessible
Customer Experience	Low personalization	Highly tailored and interactive
Fraud Detection	Manual audits	AI-driven anomaly detection

Source: Author’s Development

Synergizing Ayushman Bharat PM-JAY and Ayushman Bharat Digital Mission for Universal Health Coverage

India's Ayushman Bharat initiative, comprising the Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) and the Ayushman Bharat Digital Mission (ABDM), represents a significant stride towards achieving Universal Health Coverage (UHC). The integration of these two components is transforming the nation's healthcare landscape by enhancing accessibility, affordability, and efficiency. Moving forward, AB-PMJAY launched in 2018 and is also the world's largest publicly funded health insurance scheme, offering coverage of up to Rs. 5 lakh per family per year for secondary and tertiary care hospitalization. As of March 24, 2025, over 36.9 crore Ayushman cards have been issued, facilitating access to cashless healthcare services across India. In March 2024, eligibility was extended to include 37 lakh ASHAs, Anganwadi Workers, and their families. From October 2024, approximately 6 crore senior citizens aged 70 and above, irrespective of socio-economic status, became eligible for free treatment benefits. Further, from 2015 to 2022, Government health expenditure increased from 29.0% to 48.0%, while out-of-pocket expenditure declined from 62.6% to 39.4%, resulting in savings exceeding Rs. 1.25 lakh crore for beneficiaries.

The Ayushman Bharat Digital Mission (ABDM), launched on September 27, 2021, is a flagship initiative of the Government of India aimed at building a comprehensive digital health ecosystem. Spearheaded by the National Health Authority (NHA) under the Ministry of Health and Family Welfare, the mission is designed to revolutionize healthcare delivery by leveraging digital technologies to make healthcare more accessible, affordable, transparent, and efficient. However, ABDM aims to establish the Digital Health Ecosystem of India, enabling the secure exchange of health data among citizens, healthcare professionals, and health service providers across the country. It envisions a citizen-centric, technology-driven, and interoperable framework to facilitate integrated digital health services. Besides, Over 73.98 crore Ayushman Bharat Health Accounts (ABHA) have been generated. 3.63 lakh health facilities have been registered. 5.64 lakh healthcare professionals have been enlisted. Nearly 49.06 crore health records have been linked with ABHA.

In the light of the above, the synergy between PM-JAY and ABDM is revolutionizing healthcare delivery in India by merging financial protection with digital innovation. Together, they are enhancing access, reducing costs, and empowering citizens marking a vital step toward inclusive, efficient, and technology-driven universal health coverage for all.

Digital Health Insurance Ecosystem: Challenges and Opportunities

India's journey toward a digital health insurance ecosystem marks a transformative shift in healthcare delivery, access, and financial protection. With initiatives like Ayushman Bharat Digital Mission (ABDM) and Pradhan Mantri Jan Arogya Yojana (PM-JAY), the convergence of technology and health insurance is creating a more inclusive, efficient, and transparent system. However, the path is not without challenges.

Challenges:

- 1) Uneven digital literacy and internet access, especially in rural and remote regions, hinder widespread adoption.
- 2) Managing and protecting sensitive health data across interoperable platforms remains a major concern.
- 3) Inadequate digital infrastructure in public health institutions limits the seamless implementation of digital health services.
- 4) Aligning public and private health insurers, service providers, and platforms within a common digital ecosystem poses operational challenges.
- 5) Absence of standardized norms and evolving policies can affect uniform implementation and accountability.

Opportunities:

- 1) Digitization enables real-time claim processing, teleconsultations, and data-driven decision-making, enhancing the overall patient experience.
- 2) Automated systems and data analytics reduce administrative costs, fraud, and unnecessary treatments.
- 3) With ABHA IDs and digital health records, individuals gain better control over their health journeys.
- 4) Data insights can lead to customized health insurance products tailored to demographic needs and risk profiles.

- 5) A unified ecosystem opens doors for collaboration among insurers, tech firms, and healthcare providers to scale innovations.

Concluding Remarks and Future Ahead

The digital transformation of health insurance in India marks a paradigm shift from paper-based inefficiencies to tech-driven, customer-centric care. With AI-powered underwriting, telemedicine, real-time claims, and wellness-linked policies, the sector is redefining healthcare accessibility and affordability. Government initiatives like PM-JAY and ABDM further strengthen the foundation for universal health coverage through financial protection and a

robust digital health ecosystem. Looking ahead, the future of health insurance lies in hyper-personalized, preventive, and predictive care. Leveraging big data, blockchain, and IoT, insurers will craft dynamic, usage-based policies tailored to individual health behavior. However, success hinges on bridging the digital divide, ensuring data security, and creating interoperable standards. A collaborative approach involving insurers, startups, regulators, and tech providers will be crucial. By way of aligning digital innovation with inclusive health goals, India is poised to lead a global model in equitable, tech-enabled health insurance delivery. 

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Efficiency of Indian Life Insurance Companies: An Estimation of Slacks Using DEA Model



Dr. Mitrendu Narayan Roy

mitrenduroy@gmail.com

Dr. Mitrendu Narayan Roy is currently associated with Hooghly Mohsin College (under the University of Burdwan) as an Assistant Professor, Department of Commerce since July 2024. Before joining his position at Hooghly Mohsin College, he was serving Goenka College of Commerce and Business Administration (under the University of Calcutta) as an Assistant Professor of Commerce since 2015. He is teaching at under-graduate as well as post-graduate levels for the last 10 years. He is also a guest faculty at Department of Commerce, University of Calcutta, for the last four years.



Professor (Dr.) Siddhartha Sankar Saha

drsiddharthasxc@gmail.com

Professor (Dr.) Siddhartha Sankar Saha having specialization in Accounting & Finance (Core Area: Financial Markets & Financial Services), is Professor of Commerce currently and former Head & Chairman of PGBOS in Commerce, Post-Graduate Department of Commerce, University of Calcutta, Kolkata, India. He is also member, Faculty Council for Post-Graduate Studies in Commerce, Social Welfare & Business Management. Professor Saha became Dean, Faculty Council for Post-Graduate Studies in Commerce, Social Welfare and Business Management, Liaison Officer, University of Calcutta. He was member, Senate and Syndicate, University of Calcutta earlier. He also became Director, University of Calcutta –Calcutta Stock Exchange Centre of Excellence in Financial Market (CUCSE-CEFM), and Director, Internal Quality Assurance Cell (IQAC) previously. Professor Saha previously joined St. Xavier's College (Autonomous), Kolkata, India in 1998 and served the Department of Commerce (Accounting and Finance), St. Xavier's College (Autonomous), Kolkata, India as an Associate Professor for several years.

Abstract

The purpose of the article is to use Data Envelopment Analysis (DEA) to calculate the Overall Technical Efficiency (OTE) of the life insurance companies that were active in India during the Covid-19 period. An overview of life insurance businesses operating during this time period is discussed in the study. Data on input and output variables for each of these 24 life insurance companies in 2019–

20 and 2020–21 have been gathered from the Insurance Regulatory and Development Authority (IRDA) Handbook of Statistics in order to measure their efficiency. For the purpose of measuring efficiency scores, operating expenses and commission expenses have been regarded as input variables, and investment income, premium earned, and benefits paid have been regarded as output variables. Following the determination of the companies' OTE,

the study additionally ascertains the gaps in input and output variables for each company over the course of the investigation. The average OTE for 2020–21 is 68.3%, and for 2019–20 it is 70.1%. Slacks in the investment income and benefits paid during the study period have been found in the majority of the companies. Therefore, in the post-Covid era, organizations must prioritize these two issues to raise their efficiency.

Keywords

Life insurance; OTE; Covid; DEA; Slacks; Charnes, Cooper and Rhodes (CCR) Model; IRDA

1. Introduction

The origin of life insurance business in India can be traced back the year 1818 when Oriental Life Insurance Company was first set up in Calcutta, the capital of the erstwhile British India (*Sarkhel & Salim, 2017; Saha, 2021*). Life insurance businesses were mostly run by private players till India's independence in 1947. However, the nationalisation of life insurance in India began in the year 1956 by clubbing 154 domestic insurance businesses, 16 foreign insurance companies, and 75 provident funds under the aegis of Life Insurance Corporation of India (LIC) by virtue of the Life Insurance Corporation Act, 1956. The LIC had a monopoly in the market of life insurance for about 44 years (*Parida & Acharya, 2017; Saha, 2020*). During 1991-92, the Indian economy opened its doors for the world with the motto of Liberalisation, Privatisation and Globalisation (LPG reforms). This paved the way for insurance sector reforms. In the year 1993, a committee under the chairmanship of Mr. R. N. Malhotra, former Governor, Reserve Bank of India (RBI) was formed to propose a few reform measures for this sector. Malhotra Committee Report, proposed gradual entry of private players into the life insurance market; suggested separation of life and non-life business; and recommended regulatory and prudential norms for the new entrants (*Malhotra,*

1994). The Insurance Regulatory and Development (IRD) Bill was proposed in the Parliament in 1999. Eventually, The Insurance Regulatory and Development Authority (IRDA) Act, 1999 (IRDA Act) was enacted and the Insurance Regulatory and Development Authority of India (IRDAI) was formed. One of the important purposes of the IRDAI was deregulation of the insurance market and opening it up to the private insurers. The IRDAI also allowed 26% Foreign Direct Investment (FDI) into this sector that opened it up to foreign players. Initially in the year 2001-02, 11 private players entered into the market. However, after almost two-decade of deregulation, presently, a total of 24 companies including LIC are operating in this space (*Saha and Roy, 2021*).

The operational growth of the sector suddenly experienced a shock when Covid-19, a worldwide pandemic and ensuing economic lockdown grappled the worldwide financial markets in the early 2020s (*Sansa, 2020*). It was expected that life insurance sector would also face operational setbacks just like other financial sectors. However, contrary to the common belief, the Covid-19 that loomed over the world from 2019-20 to 2021-22, proved to be the growth years for Indian life insurance industry, perhaps because of a sudden surge in demand for the life insurance policies with a view to securing family's future amid the increasing death toll from the disease. Therefore, Covid-19 had taken Indian life insurance market to a completely different direction that ultimately impacted the economy. The data suggests that during 2019-20

and 2020-21 only, the life insurance companies together sold a total of 569 lakhs new policies, 65% of which are sold by the LIC alone. The remaining 35% of the new policies were sold by the 23 private life insurance companies. Total premium mobilisation has also increased from Rs. 572910.19 crores in 2019-20 to Rs. 628731.04 crores in 2020-21, projecting an unprecedented growth of almost 10% (*IRDAI, 2021*).

Since companies in the life insurance sector mobilise small savings in the form of premium and invest the same in multiple sectors as per the portfolio prescribed by the IRDAI, they are directly responsible for the capital formation within the economy. Hence, it might not be overstatement that the life insurance companies, if efficiently operated can fasten the economic growth. However, question arises as to whether the growth in the life insurance business during the Covid-19 pandemic was solely due to the surge in demand for the life insurance policies or also because of the operational efficiencies of the companies. In view of the above research question, the present paper seeks to estimate the operational efficiencies of all the players in the life insurance sector during Covid-19 pandemic and identify the possible lacuna that are faced by the inefficient companies.

2. Past Studies and Research Gap

The privatization of the life insurance industry brought a huge competition among the players of the life insurance business. *Kannan (2010)*, in a theoretical discussion held that

the competition among the players led to growth in the employment opportunities and spur of information technology that ultimately resulted in growth of life insurance sector at a very rapid rate. *Singh & Ali (2020)* analyzed the performance of Indian life insurance companies for the period 2009-2010 to 2017-2018. The study indicated a positive influence of liberalization on the insurance market and that the LIC would continue to be the market leader. The concept of technical efficiency was introduced by *Koopmans (1951, p. 79)* while explaining the efficient point of a production stage. According to the theory, a firm was said to be technically efficient if an increase in output of a final product led to reduction of the output on another product. The concept was further explained by *Debreu (1951)* by introducing the radial measure of efficiency. The literature criticized the unnecessary use of calculus, while the local maxima-minima point could be achieved by the means of linear programming techniques. Various extensions of the DEA models were thereafter done out of which slack-based DEA models (*Tone, 2001*) and slack-based network DEA (*Tone & Tsutsui, 2010*) was quite prominent. In one of the studies, *Shieh et al. (2020)* compared the efficiencies of life insurance industries of China and Taiwan by constructing meta frontier for the life insurance companies of both the countries and separate regional frontiers for two different countries. The efficiency scores were calculated using a slack based DEA model. The study analysed the insurance companies of China and Taiwan for the period 2005 to

2011 using an unbalanced panel data. All the nominal variables were deflated using United States (US) Gross Domestic Product (GDP) deflators with 2005 as the base year. The study analysed the impact of environmental variables on the input slacks. *Sinha (2015)* applied the slack-based dynamic DEA model proposed by *Tone & Tsutsui (2010)* for analysing 15 India life insurance companies. The model was implemented in order to understand the link between various periods. The study used 'investments' as link or carry-over variable. Carryover variables were the variables which are held for a continuous period. The carry-over variables were decided from the output variables selected for study. The study also computed 'Factor Efficiency Index (FEI)' as by dividing actual data with projected data.

Most of the literature reviewed so far, focusses on slack-based DEA models (*Tone, 2001*) or/ and slack-based network DEA (*Tone & Tsutsui, 2010*) model. However, the Charnes, Cooper and Rhodes (CCR) model under the assumption of Constant Returns to Scale (CRS) also provides measures for identifying slacks in input and output variables considered for estimating Overall Technical Efficiency (OTE) scores. Moreover, studies that highlights on the efficiency of life insurance companies during the pandemic period (2019-20 and 2020-21) is also comparatively less in number. Keeping both these gaps in existing researches in view, the current study has been made to estimate the OTE scores of Indian life insurance companies during the pandemic period and to find out the

slacks in input and output variables during this period.

3. Research Objectives

The major objectives of the present study are to:

- (i) Estimate the efficiency of life insurance companies in India during the Covid-19 pandemic period; and
- (ii) Explore the deficiencies in select financial parameters of the inefficient companies and propose corrective measures.

4. Research Methods

4.1. Methodology in addressing Objective-1

Period of Study

With a view to estimating the efficiency of the Indian life insurance companies during the Covid-19 pandemic period exploring deficiencies in select financial parameters of the inefficient companies, the financial years, 2019-20 and 2020-21, have been considered as the study period because the first case of Covid-19 was diagnosed in the year 2019-20 and the waves persisted in the next year as well.

Selection of Model for Efficiency Analysis

There are many studies on the efficiencies of financial institutions in the US and other industrialized nations (*Berger et al., 1993; Berger and Humphrey, 1997; Berger and Mester, 1997*). Actually, the majority of the literature focuses on bank efficiency. But with time, insurance companies have also emerged as

one of important constituent of the financial system of the economy, making the researchers increasingly interested in insurance companies' efficiency assessments (see the literature review in Section 2). In addition to the traditional financial ratios, some cutting-edge frontier methods have been employed by them to analyse the efficiency of the insurance firms. Furthermore, when it comes to creating accurate and significant metrics with respect to insurance businesses' performance, frontier methods outperform classic ratio analysis making the traditional ratio analysis outdated to some extent.

It is important to remember that every frontier method uses different models to determine how closely individual insurance businesses adhere to a standard of best practices for the sample of insurance companies [also known as the Decision-Making Units (DMUs)]. The standard of best practices often takes the shape of an efficient frontier that is calculated by mathematical programming or econometric methods. In this way, the frontier methods estimate the performance of insurance businesses into a single statistic justifies the variations among insurance companies.

Each model under frontier methods produces a different estimate of efficiency and has unique benefits and drawbacks (*Bauer et al., 1998*). However, in all the studies made so far that used different frontier models to evaluate the relative performances of financial institutions, DEA has been used in more than 50% of the studies because of its inherent benefits over

other frontier models (*Berger and Humphrey, 1997*). In fact, DEA has become one of the most effective models for comparing the relative efficiency of insurance businesses over time.

Selection of Decision-Making Units (DMUs)

The DMUs for the current study comprise all the 24 life insurance companies operating in India during the study period (Table 1).

Table 1. Life insurance companies under study and their year of incorporation

S. No.	Insurer (DMUs)	Year of Incorporation
<i>Public Sector</i>		
1	Life Insurance Corporation of India Limited (Ltd.)	1956-57
<i>Private Sector</i>		
1	Aditya Birla Sunlife Insurance Company Ltd.	2000-01
2	Aegon Life Insurance Company Ltd.	2008-09
3	Ageas Federal Life Insurance Company Ltd.	2007-08
4	Aviva Life Insurance Company India Ltd.	2002-03
5	Bajaj Allianz Life Insurance Company Ltd.	2001-02
6	Bharti AXA Life Insurance Company Ltd.	2006-07
7	Canara Hongkong and Shanghai Banking Corporation (HSBC) Oriental Bank of Commerce (OBC) Life Insurance Company Ltd.	2008-09
8	Edelweiss Tokio Life Insurance Company Ltd.	2011-12
9	Exide Life Insurance Company Ltd.	2001-02
10	Future Generali India Life Insurance Company Ltd.	2007-08
11	Housing Development Finance Corporation (HDFC) Life Insurance Company Ltd.	2000-01
12	Industrial Credit and Investment Corporation of India (ICICI) Prudential Life Insurance Company Ltd.	2000-01
13	IndiaFirst Life Insurance Company Ltd.	2009-10
14	Kotak Mahindra Life Insurance Ltd.	2001-02
15	MaxLife Insurance Company Ltd.	2000-01
16	Punjab National Bank (PNB) Metlife India Insurance Company Ltd.	2001-02
17	Pramerica Life Insurance Company Ltd.	2008-09
18	Reliance Nippon Life Insurance Company Ltd.	2001-02
19	Sahara India Life Insurance Company Ltd.	2004-05
20	State Bank of India (SBI) Life Insurance Company Ltd.	2001-02
21	Shriram Life Insurance Company Ltd.	2005-06
22	Star Union Dai-ichi Life Insurance Company Ltd.	2008-09
23	Tata American International Assurance (AIA) Life Insurance Company Ltd.	2001-02

(Source: Handbook of Insurance Statistics 2020-21)

Banker et al. (1989), Pedraja-Chaparro et al., (1999), Cooper et al., (2006) and Zhu (2014) in their papers defined the rule of thumb for selecting the number of DMUs as follows:

$$\Rightarrow n \geq \max \{m \times s, 3(m + s)\} \dots (1)$$

Where, n is the number of DMUs; m represents the number of input variables; and s represents the number of output variables.

Selection of Input and Output Variables

In DEA, efficiency is a function of select input and output variables. Input and output variables are nothing but select financial attributes concerning a particular industry that theoretically have input-output relations among them. Initially, based on existing literature two input variables and three output variables have been selected for the purpose of estimating efficiency frontier. Since the number of DMUs in the current study is 24 ($n=24$), a two-input ($m=2$) and three-output ($s=3$) also fulfils the criteria set under Equation (1) (i.e. $24 \geq \max \{2 \times 3, 3(2 + 3)\}$). Out of several output variables concerning insurance industry that were selected in the past studies, the current paper considers the following based on value-added approach of selecting output variables (Sinha, 2013): (Y_1) Gross Investment Income (Huang et al., 2019; Zhao et al., 2021); (Y_2) Net Premium Earned (Barros & Wanke, 2016; Sinha, 2021); and (Y_3) Benefits Paid (Eling & Luhnen, 2010; Biener et al., 2016). Likewise, out of many input variables that are used to represent the output variables, following two are selected

based on existing literature: (X_1) Operating Expenses (Yang, 2006; Tone et al., 2019; Guo et al., 2020); and (X_2) Commission Expenses (Sinha, 2009, Zhao et al., 2021).

It is necessary that all the input and output variables are significantly positively correlated among themselves. Otherwise, the results produced can be misleading. The compliance with the condition can be checked by conducting the Test of Isotonicity, which is nothing but a test of checking whether the data corresponding to the input and output variables are significantly positively correlated with one another for the period under study. If the Test of Isotonicity shows significant positive correlations among the input and output variables, it may be inferred that the selection of input and output variables for conducting DEA is appropriate.

Data Collection

The data on the input and output variables for all the 24 DMUs during the study period has been collected from the Handbook of Indian Insurance Statistics, 2021 available at the IRDAI official website. The data so collected as subject to yearly inflations. In order to do away with it, the data pertaining to individual variables are deflated using the Gross Domestic Product (GDP) deflator taking 2011-12 as the base year (worldbank.org). DEA run on an inflation-adjusted data, is likely to generate more accurate results.

Data Analysis

The purpose of DEA model is to estimate a standard of best practices

for the insurance companies based on input and output variables. With a view to achieving this objective, the study considers a specific technique under DEA which was proposed by Charnes, Cooper and Rhodes (CCR) in 1978. Hence, the technique is also known as CCR technique. The efficiency scores estimated for each DMU under this technique is known as Overall Technical Efficiency (OTE). The OTE scores of each DMU can be estimated based on two distinct orientation – input orientation and output orientation. Chen et al. (2018) and Liberty and Grace (2010), in their respective papers, proposed input orientation to be a more appropriate orientation for estimate of OTE scores. The mathematical representation of OTE in input-oriented CCR technique is as follows:

$$\Rightarrow \text{Efficiency} = \frac{\text{Minimum input}}{\text{Actual input}} \dots (2)$$

In the model, multiple combinations of inputs may be used for production of multiple combinations of outputs. However, since OTE is calculated based on input oriented CCR technique, the model assumes that all the DMUs produce a standard output combination. It then determines the standard of best practices for the industry by estimating the optimum input combination (i.e. minimum possible input) required for production of the standard/ current output combination by using a linear programming function subject to certain constraints. In Equation (2), this optimum input combination is referred to as minimum input. OTE is the ratio of minimum input to actual input. If the actual input of a DMU for producing a standard output is

equal to the minimum input, the efficiency of that DMU is equal to one (1) ($OTE=1$), which implies that the DMU is 100% efficient. However, if the actual input of a DMU for producing a standard output is less than the minimum input, the efficiency of that DMU is less than one (1) ($OTE<1$), which implies that the DMU is inefficient to the extent the actual input is less than the minimum input.

Analytical Tools

Data on input and output variables for the study period is tabulated and deflated (using GDP deflator) in Microsoft (MS) Excel. OTE scores of individual DMUs for the said period has been estimated using DEA Frontier, an Excel based mathematical package designed for this purpose. MS Excel has also been used for preparation of charts based on the OTE scores.

4.2. Methodology in addressing Objective-2

The deficiencies in input and/ or output variables (used for estimation of OTE scores) of the inefficient companies are known as slacks. Any deficiency in input variables is referred to as input slack (i.e. excess requirement of input), while a deficiency in the output (i.e. shortfall in output from the standard output) variables is known as output slacks. Just like estimation of OTE scores, estimation of input and/ or output slacks are also made by solving linear programming models subject to certain constraints. If a DMU is efficient ($OTE=1$), all its input and output slacks will be equal

to zero (0) (Cooper et al., 2006; Agarwal et al., 2011). Hence, if the inefficient companies can eliminate their input or output slacks, they will be able to achieve efficient status. For this purpose, the input slack(s) are subtracted from the respective input(s) and output slacks(s) are added with the respective output(s) to achieve target input(s) or output(s). In other words, if an inefficient company is able to achieve target input(s) or output(s) after adjusting for the input or output slack(s), it would be able to achieve efficient status.

With a view to addressing Objective-2, deflated data (using GDP deflator) on select input and output variables (as referred in Section

4.1) for all 24 DMUs for the period 2019-20 and 2020-21 are analysed using input-oriented CCR model. DEA Frontier has been used for estimation of input and output slack(s) for each input and output variables concerning all the 24 DMUs during the study period. Subsequently, a few charts have been prepared based on the data on input and output slack(s) using MS Excel.

5. Results and Discussion

Results from the Test of Isotonicity (Table 2) suggests that all the input variables have significant positive correlation with the output variables. It proves that the variables are appropriately selected for conducting DEA.

Table 2. Correlation among input-output variables for Test of Isotonicity

Pearson Correlation	Operating Expenses	Commission	Investment Income	Premium earned	Benefits Paid
Operating Expenses	1	0.961**	0.983**	0.980**	0.980**
Commission	0.961**	1	0.952**	0.988**	0.942**
Investment Income	0.983**	0.952**	1	0.977**	0.989**
Premium Earned	0.980**	0.988**	0.977**	1	0.972**
Benefits Paid	0.980**	0.942**	0.989**	0.972**	1
**. Correlation is significant at the 0.01 level (2-tailed) (p-Value<0.01).					

(Source: Compilation of Secondary Data using DEA Frontier)

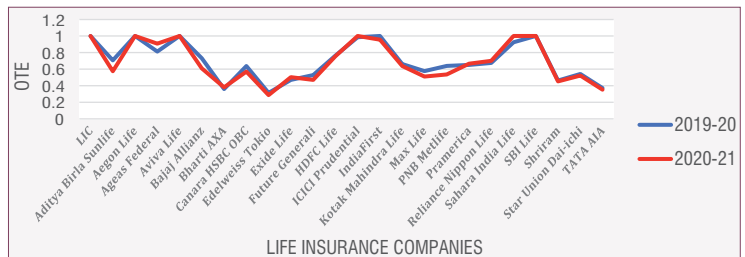
5.1. Estimating efficiency of Indian life insurance companies during Covid-19

The OTE scores of the life insurance companies during the study period (2019-20 and 2020-21) is estimated (Table 3). The average OTE score of each company during the study period; the average OTE score of the industry for each year of the study period; and average OTE score of the industry during the study period have also been evaluated from the yearly OTE scores of the individual companies.

Table 3. Estimated OTE scores during the study period

Name of the Company (DMUs)	OTE Scores		
	2019-20	2020-21	Mean
Life Insurance Corporation of India (LIC)	1.000	1.000	1.000
Aditya Birla Sunlife Insurance Company Ltd. (Aditya Birla Sunlife)	0.707	0.575	0.641
Aegon Life Insurance Company Ltd. (Aegon Life)	1.000	1.000	1.000
Ageas Federal Life Insurance Company Ltd. (Ageas Federal)	0.812	0.908	0.86
Aviva Life Insurance Company India Ltd. (Aviva Life)	1.000	1.000	1.000
Bajaj Allianz Life Insurance Company Ltd. (Bajaj Allianz)	0.732	0.609	0.6705
Bharti AXA Life Insurance Company Ltd. (Bharti AXA)	0.359	0.381	0.37
Canara HSBC OBC Life Insurance Company Ltd. (Canara HSBC OBC)	0.638	0.570	0.604
Edelweiss Tokio Life Insurance Company Ltd. (Edelweiss Tokio)	0.314	0.287	0.3005
Exide Life Insurance Company Ltd. (Exide Life)	0.470	0.503	0.4865
Future Generali India Life Insurance Company Ltd. (Future Generali)	0.528	0.470	0.499
HDFC Life Insurance Company Ltd. (HDFC Life)	0.763	0.756	0.7595
ICICI Prudential Life Insurance Company Ltd. (ICICI Prudential)	0.986	1.000	0.993
IndiaFirst Life Insurance Company Ltd. (IndiaFirst)	1.000	0.955	0.9775
Kotak Mahindra Life Insurance Ltd. (Kotak Mahindra Life)	0.662	0.637	0.6495
MaxLife Insurance Company Ltd. (Max Life)	0.577	0.511	0.544
PNB Metlife India Insurance Company Ltd. (PNB Metlife)	0.639	0.537	0.588
Pramerica Life Insurance Company Ltd. (Pramerica)	0.652	0.666	0.659
Reliance Nippon Life Insurance Company Ltd. (Reliance Nippon Life)	0.676	0.701	0.6885
Sahara India Life Insurance Company Ltd. (Sahara India Life)	0.924	1.000	0.962
SBI Life Insurance Company Ltd. (SBI Life)	1.000	1.000	1.000
Shriram Life Insurance Company Ltd. (Shriram)	0.463	0.452	0.4575
Star Union Dai-ichi Life Insurance Company Ltd. (Star Union Dai-ichi)	0.542	0.523	0.5325
Tata AIA Life Insurance Company Ltd. (TATA AIA)	0.372	0.353	0.3625
Mean	0.701	0.683	0.692

(Source: Compilation of Secondary Data using DEA Frontier)

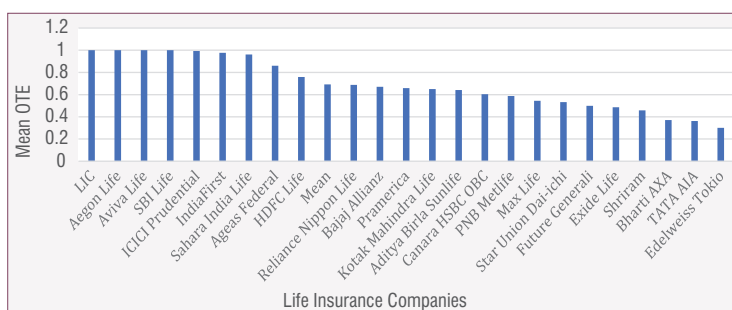
Chart 1. OTE scores of individual companies in 2019-20 and 2020-21

(Source: Based on Table 3)

It is observed that during the Covid-19 pandemic, Indian life insurance industry was 69.2% efficient (OTE=0.692) in an average. However, the average efficiency of the industry came down from 70.1% (OTE=0.701) in 2019-20 to 68.3% (OTE=0.683) in 2020-21.

In both the years, all the companies performed almost uniformly with minor deviations (Chart 1). While some companies (LIC, Aegon Life, Aviva Life, SBI Life) maintained their efficient status ($OTE=1$) in both the years, IndiaFirst lost it as it moved from 2019-20 to 2020-21. On the other end, companies like ICICI Prudential and Sahara India Life had enhanced their efficiency. Though they were not efficient ($OTE<1$) in 2019-20, they achieved the efficient status in the following year. While efficiency of most of the other inefficient companies declined from 2019-20 to 2020-21, there are some inefficient companies (Ageas Federal, Bharti AXA, Exide Life, Pramerica, and Reliance Nippon Life) that had managed to improve their efficiency even during this period (OTE in 2019-20 $>$ OTE in 2020-21).

Chart 2. Ranking of life insurance companies based on average OTE scores during pandemic period



(Source: Based on Table 3)

The companies may also be ranked based on their average efficiency during the Covid-19 pandemic (i.e. 2019-20 and 2020-21) (Chart 2). It shows that even during the Covid-19 pandemic, the LIC, Aegon Life, Aviva Life and SBI Life were efficient (average $OTE=1$). ICICI Prudential, IndiaFirst, Sahara India Life were marginally inefficient during this period (average $OTE>0.9$). However, Shriram, Bharti AXA, TATA AIA, and Edelweiss Tokio projected low efficiency (average $OTE<0.5$) during this period.

5.2. Exploring input and output slacks during the pandemic period

Input and output slacks for each inefficient life insurance companies

($OTE<1$) for each year during the study period are estimated. None of the inefficient companies projected input slacks during the study period. It indicates that two input variables (i.e. 'commission' and 'operating expenses') of the inefficient companies were at the optimum level during the Covid-19 pandemic. However, almost all the companies projected output slacks with respect to one or more output variables. In both the years during the study period, maximum number of inefficient companies projected output slack with respect to 'gross investment income' followed by 'benefits paid' and 'net premium earned' (Chart 6). In terms of average values of output slacks in each year

during the study period, in the year 2019-20, 'gross investment income' projected highest average slack, followed by 'benefits paid' and 'net premium earned'. However, in the following year, 'benefits paid' showed highest average slack value followed by 'gross investment income' and 'net premium earned' (Chart 7). Out of 17 inefficient companies that projected output slacks with respect to 'gross investment income' in 2019-20, seven (7) had been able to completely eliminate this slack in 2020-21. The remaining 14 companies had also been able to reduce this slack to a significant extent. IndiaFirst was the only company that did not report an output slack with respect to 'gross investment income' in 2019-20 but a significant output slack in 2020-21 (Chart 3). When it comes to 'net premium earned', out of all the inefficient companies, only Sahara India Life projected an output slack in 2019-20 and only IndiaFirst projected an output slack in 2020-21 (Chart 4). Out of 14 inefficient companies that projected output slacks in terms of 'benefits paid' in both the years during the study period, four (4) (Aditya Birla Sunlife, Max Life, Star Union Dai-ichi and TATA AIA) had projected higher output slack in 2020-21 as compared to its preceding year. While Sahara India Life that projected output slack for this variable, had been able to completely eliminate it in the following year, Aditya Birla Sunlife which was not suffering from output slack for this variable, actually projected one in the year that followed (Chart 5).

6. Conclusion

The paper assessed the relative performance of all the 24 life insurance companies operating in India during the Covid-19 pandemic period primarily to understand the impact of the pandemic on the efficiency of the life insurers. The results suggest that the efficiency of the life insurance sector as a whole was not severely impacted perhaps because of a sudden surge of demand for life insurance policies during this period and a prompt action from the companies to cater to such needs. While average efficiency of the sector slightly reduced during the pandemic, quite a few companies had been able to increase their efficiency during this period.

However, for the big players like the LIC, SBI Life, etc., pandemic did not create that much of a concern, so far as efficiency is concerned. The paper has also taken an attempt to estimate the deficiencies in the select input and output variables of the life insurance companies that actually resulted in their inefficiency in each of the years during the study period. The results indicate that the inefficient companies were not suffering from any deficiency in terms of 'operating expenses' or 'commission expenses' during this period. The inefficiencies in these companies were solely due to deficiencies in one or more output variables. It is observed that maximum number of companies had output slacks in 'gross investment income' in both

the years during the study period. In terms of average value of slacks too, 'gross investment income' projected highest figure in 2019-20. However, in 2020-21, 'benefits paid' had the highest average slack value. The slacks in 'gross investment income' was generated perhaps because of a sluggish market movement during Covid-19 pandemic and its ensuing lockdown. As soon as the market recovers in the late 2021, this slack seemed to get diminished for most of the companies. Furthermore, increasing death toll at the advent of the pandemic might have increased the number of claims. However, all the life insurers were not in a position to process those claims promptly which perhaps resulted in slacks in 'benefits paid'. **■**

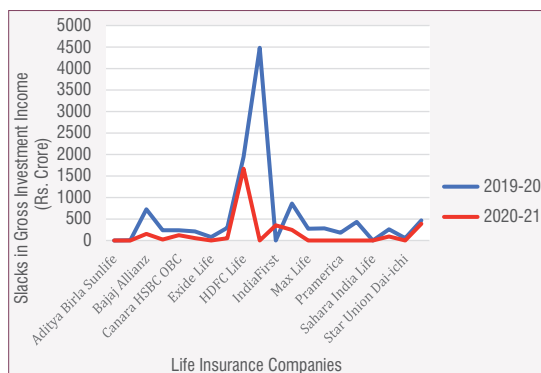
Table 4. Estimation of input and output slacks during the pandemic period

Name of the Company	2019-20 (Rs. Crore)					2020-21 (Rs. Crore)				
	Operating Expense (I)	Commission Expense (I)	Gross Investment Income (O)	Net Premium Earned (O)	Benefits Paid (O)	Operating Expense (I)	Commission Expense (I)	Gross Investment Income (O)	Net Premium Earned (O)	Benefits Paid (O)
Aditya Birla Sunlife	0	0	0	0	0	0	0	0	0	233.97
Ageas Federal	0	0	4.98	0	272.29	0	0	0	0	162.49
Bajaj Allianz	0	0	725.28	0	0	0	0	153.82	0	0
Bharti AXA	0	0	240.88	0	734.73	0	0	24.27	0	432.28
Canara HSBC OBC	0	0	236.86	0	164.26	0	0	124.49	0	164.18
Edelweiss Tokio	0	0	211.05	0	554.75	0	0	54.03	0	335.05
Exide Life	0	0	80.56	0	385.47	0	0	0	0	164.68
Future Generali	0	0	295.67	0	619.18	0	0	52.83	0	214.18
HDFC Life	0	0	1945.84	0	0	0	0	1669.77	0	0

Name of the Company	2019-20 (Rs. Crore)					2020-21 (Rs. Crore)				
	Operating Expense (I)	Commission Expense (I)	Gross Investment Income (O)	Net Premium Earned (O)	Benefits Paid (O)	Operating Expense (I)	Commission Expense (I)	Gross Investment Income (O)	Net Premium Earned (O)	Benefits Paid (O)
ICICI Prudential	0	0	4482.87	0	0	0	0	0	0	0
IndiaFirst	0	0	0	0	0	0	0	352.36	438.40	0
Kotak Mahindra Life	0	0	859.54	0	1355.65	0	0	246.98	0	806.80
Max Life	0	0	272.64	0	943.44	0	0	0	0	1531.37
PNB Metlife	0	0	284.05	0	578.92	0	0	0	0	389.36
Pramerica	0	0	181.21	0	451.01	0	0	0	0	162.99
Reliance Nippon Life	0	0	433.53	0	189.64	0	0	0	0	24.16
Sahara India Life	0	0	0	51.64	41.45	0	0	0	0	0
Shriram	0	0	259.42	0	507.32	0	0	93.99	0	326.36
Star Union Dai-ichi	0	0	53.41	0	81.65	0	0	0	0	143.18
TATA AIA	0	0	470.12	0	936.44	0	0	388.14	0	1368.73
Average	0	0	551.90	2.58	390.81	0.00	0.00	158.03	21.92	322.99
Frequency	0	0	17	1	15	0	0	10	1	15

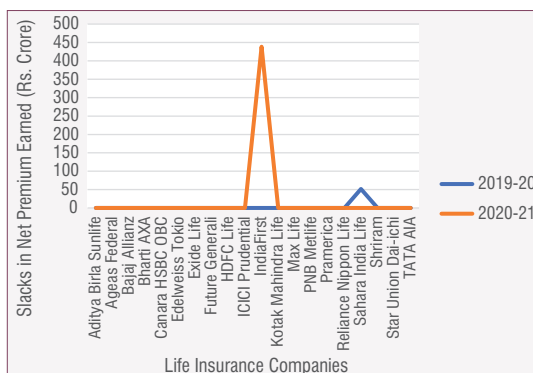
(Source: Compilation of Secondary Data using DEA Frontier)

Chart 3. Company-wise slacks in gross investment income

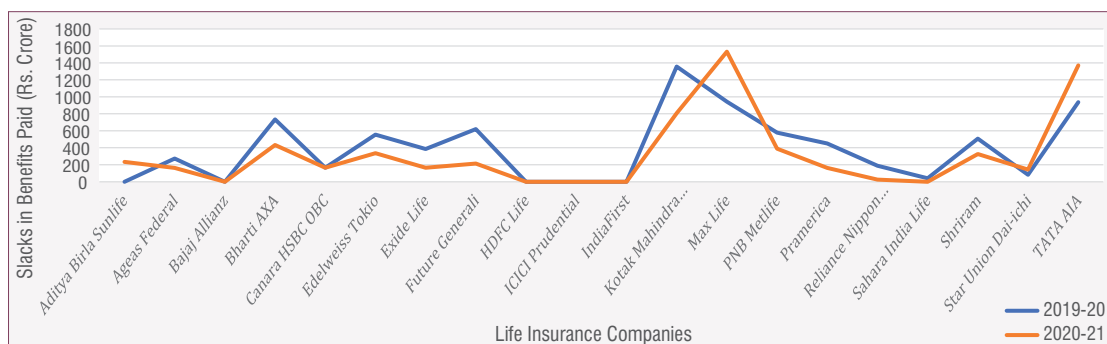
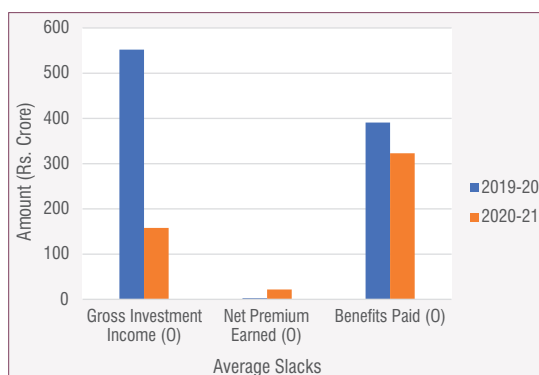
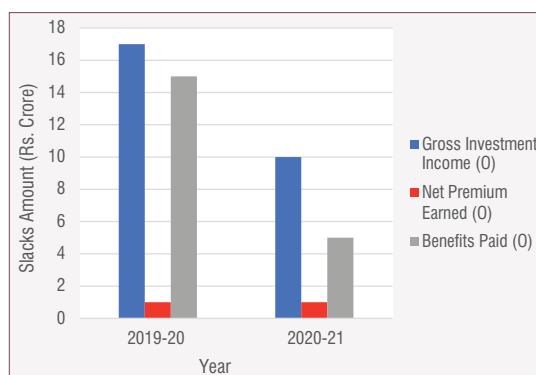


(Source: Based on Table-4)

Chart 4. Company-wise slacks in net premium earned



(Source: Based on Table-4)

Chart 5. Company-wise slacks in benefits paid**(Source: Based on Table-4)****Chart 6. Average slacks during the pandemic period****(Source: Based on Table-4)****Chart 7. Frequency count of slacks during the pandemic period****(Source: Based on Table-4)**

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Derivatives as a Risk Management Tool for Health Insurers in India: Exploring the Potential and Practical Implications



Nishtha Agrawal

nishtha123agrawal@gmail.com

Nishtha Agrawal is a Research scholar, at the Department of Commerce CMP degree college, University of Allahabad. She is also Graduate and Post Graduate in Commerce from University of Allahabad. She also holds UGC NET JRF in commerce.



Shweta Jaiswal

shwetajaiswal452@gmail.com

Shweta Jaiswal is a Research scholar, at the Department of Commerce CMP degree college, University of Allahabad. She is also Graduate and Post Graduate in Commerce from University of Allahabad. She also holds UGC NET JRF in commerce.

Abstract

India is a country that has a booming health insurance market—a market that has the potential to grow even ore. In terms of risk management, however, the market has several large issues to confront. The fact finding of this research seeks to uncover whether the changing dynamics of the Indian derivative market could offer efficient risk management solutions to the health insurance industry. The research also measures current and growth trends in India's overall health insurance and derivatives market through secondary data analysis. It examines the major risk factors that affect the reinsurers; they include medical inflation risk, demographic risk, and regulatory risk. The study then examines the

applicability of different existing derivative instruments, namely weather derivatives, catastrophe and derivatives bonds, and mortality bonds, for mitigating such health insurance risks in India. This research indicates that while in the last few years India has witnessed immense growth on exchange-traded equity, commodity, and currency derivatives, the market for over-the-counter more equity-specific tailored derivatives is still relatively underdeveloped. New mortality bonds and catastrophe bonds that could possibly pass longevity risk and the risk of adverse severe medical event occurrences to insurers have remained virtually nonexistent domestically. Besides, in the medical and health sector, it remains in double figures, meaning it brings pricing and reserving problems

to the insurance firms. The evaluation shows that mortality swaps, medical inflation swaps, and options, as well as pandemic catastrophe bonds, have possibilities of being applied in forward-looking risk management for India's health insurers once the derivatives market develops.

The paper offers suggestions to insurers, policymakers, and derivative exchanges to raise awareness, facilitate the creation of rules governing the health insurance derivatives, make the pricing information more transparent, and foster the patient base for developing some of the more complex forms of health insurance derivatives. This would in the long run provide for sound methods of risk transfer for the health insurance providers. In conclusion, although the Indian

derivatives market is relatively nascent, targeted action is required from all market participants to harness its capability to support the burgeoning health insurance sector through improved risk management.

Keywords

Financial Derivatives, Health Insurance, Risk mitigation, Hedging.

JELCODES: G13, I13, G22, G32

Introduction

Overview of the Indian health insurance industry and its rapid growth.

The recent rapid expansion of the Indian health insurance market can be attributed to increasing healthcare costs, heightened awareness of health coverage importance, and supportive governmental policies. Health insurance represents one of the fastest-growing sectors within the Indian insurance market, driven by the expansion of the middle class and an increased emphasis on healthcare accessibility. (Vaughan & Vaughan, 2007a) The implementation of initiatives such as Ayushman Bharat, which aims to provide affordable healthcare access to millions, has significantly contributed to market growth. Furthermore, the adoption of digital technologies, including data analytics and telemedicine, has enabled insurance companies to offer more efficient and personalized services (Ewold, 1991). This rapidly evolving industry has given rise to innovative insurance products, such as critical illness plans, supplementary coverage options, and disease-specific policies.

The goal of the health insurance industry's current risk management procedures is to reduce financial risks while maintaining effective customer service and satisfaction. To evaluate and control risks, insurers employ a variety of techniques, such as predictive modelling and sophisticated data analytics. Insurers can assess patient characteristics, forecast claim trends, and pinpoint possible high-risk regions by utilizing big data. (Freeman & Kunreuther, 2012) Additionally, underwriting procedures have advanced, incorporating lifestyle and medical history to precisely determine rates. Insurance firms also employ fraud detection algorithms to lower the probability of false claims, which considerably lowers losses. Another crucial component of risk management is reinsurance, in which health insurers assign a portion of their risk portfolios to reinsurers in order to guard against unforeseen, substantial claims. Additionally, thorough regulatory compliance and solvency adherence (Freeman & Kunreuther, 2012).

Introduction to the Indian derivatives market and its expansion.

A derivative is a financial instrument whose value is derived from the performance of an underlying asset. Common examples of derivatives include options, futures, and swaps. Market participants utilize derivatives for hedging and speculation purposes. In India, the derivative market is regulated by the Securities and Exchange Board of India. Derivatives are financial instruments that derive their value from one

or more underlying assets. These assets may include equity stocks, indices such as NIFTY or BANKNIFTY, commodities like gold and crude oil, as well as currencies. Given that India operates a fully leveraged derivatives market, the potential for returns is proportionate to traditional equity trading (Townsend, 1994).

There are two derivative markets in India: exchange-traded and over-the-counter (OTC). Exchange-traded markets involve standardized contracts traded on an exchange. An Over-The-Counter market (OTC market) is a decentralized market where participants trade financial instruments directly between two parties. India features several types of derivatives trading instruments, with futures and options being the most prevalent. (Bunni & Bunni, 2022) While futures confer rights and obligations to purchase or sell the underlying asset at a future date, options grant rights (but not obligations) to buy or sell the underlying asset at a future date. In the derivatives market, investors can engage in four types of trades through futures and options: buy call, buy put, sell call, sell put. If you buy call, or sell put, you are expecting the price of the underlying to increase before the contract execution (read, expiry) date. If you purchase put subsequently or sell call, nevertheless, you are certain the residence price is going to plummet sooner or later. (Ravallion & Chaudhuri, 1997)

This form of derivatives has grown and expanded since its starting from its starting point in the year 2000

when National Stock Exchange of India (NSE) introduced Index Futures. Also rather amazingly, even today and after so many innovations, the Indian derivatives market is relatively less developed compared to other global markets. (Dercon, 2005) The market players comprise mostly institutions, while retail investors participate in very few trades due to ignorance over derivatives products. Such contradiction suggests more growth can be harnessed and more integration of individual investors is needed for efficiency. (Asmussen & Steffensen, 2020). Experience in India evidence that the growth of the derivatives market is on the right track towards a higher height of the volume of trading as well as the number of contracts traded in the last two decades (Seog, 2010). The rapid growth notwithstanding, the Indian derivatives market has a few concerns. High market risks make some individuals, especially retail investors, steer clear of the derivatives market. The effective access factor is still hampered by general education and an inability to comprehend derivatives and their risks.

Potential of derivatives to address specific risks (e.g., inflation, currency fluctuations, interest rates.

The paper argues that health insurers in India are exposed to multiple risks arising from the system, regulation, and consumer trends. Of course, one of the principal threats is the inability to address the issue of an unpredictable increase in healthcare inflation. This puts pressure on the

insurer's cost for medical treatments, which makes it challenging to price the product to consumers while remaining profitable. The same can, however, be said of fraud and abuse in claim processing, which is also common and costs organizations a lot of money. Even though great efforts have been invested in technologies aimed at preventing fraudulent actions and identifying fraudulent claims, it is still a problem to address, and progress must be made continuously in terms of systems and working methods. The increasing number of regulatory measures, including periodic updates in pricing models and compliance standards, increase the level of dynamism expected from insurers, further complicating the business of risk management. The derivatives of these challenges are manifested in the strategies that insurers apply in designing and extending the insurance product offering. Another derived product is the encouragement of investment in wellness and preventive healthcare due to lasting pertinent dangers, thus increasing policyholders' health consciousness. But alongside these prolific products are concerns: the possibility of clients getting bored out of the novelty and the difficulty of assessing the resulting variation in risk. All these aspects can only be addressed if managed well and harmonization of all these challenges aims at integrating them by having to adopt advanced analytics, strategic partnerships, as well as short-term and long-term financial stability

Figure 1.



Source: [Importance of Derivatives in Risk Management-FORE](#)

Addressing Inflation Risk

Other instruments used in hedging the inflation include inflation swaps and inflation-linked bonds. These financial tools allow the investor to protect against the dilutive impact of inflation since payout is related to an inflation index.

Mitigating Currency Fluctuations

Currency forwards and options are stable methods of managing risks related to currency exposure. These offer businesses involved in international business the ability to guard against changes in foreign exchange by fixing the currency to be used in future transactions.

Managing Interest Rate Exposure

Interest rate derivatives, especially interest rate swaps and options, are significant in hedging in relation to changes in interest rates. They allow organizations, as well as the shareholders, to manage cash flows and control the financing costs since they act based on a shifting monetary regime.

Enhancing Financial Stability

In conclusion, derivatives do melt into appropriate balance risk management mechanisms while at the same time strengthening the stability of the world markets. Derivatives make a positive impact on catalyzing stability in the global financial systems and help to maintain confidence among market participants because they provide the means of managing a precise hedge against merely the identified economic risks.

Literature Review

Careful management of risk summits in health insurance, and some of them include measures that are put in place to prevent exposure and the future stability of insurance entities emphasizes the trend toward administration and management of risks tied to policyholders' health and behavior in claims through trending and other sophisticated analytical methods, including predictive modelling and artificial intelligence. (Vaughan & Vaughan, 2007b) Efficient risk management entails factors such as healthcare cost increases, alterations in laws regulating the market, as well as the general health of consumers. Reinsurance has widely been postulated as a critical strategy that insurance companies can use to reinsulate themselves that a major disaster will not befall them. (Gupta, 2011) Furthermore, solutions for managing risks used are considered an effective method of risk distribution, which helps to manage the insurer's financial position. As an element of insurance

risk management, reinsurance is a common concept investigated in the literature, and researchers analyze the efficiency of reinsurance in protecting against sudden losses in resources due to massive or catastrophic claims (MacMinn, 1987) Again and again, there is the requirement to secure appropriate reinsurance solutions to distribute risk and optimize solvency. Further, telemedicine and other digital health tools are promising areas of discussion, as existing findings evidence their effectiveness in enhancing service provision and in mitigating risk by embracing early intervention and constant monitoring. (Dorfman, 1998)

The derivatives of these risk management practice, as it can be learnt from such academic work, involved the development of many fold insurance solutions, such as critical illness plans that target specific risky diseases. Additional and supplementary insurance solutions, dependent on the needs and preferences of the policyholder, have also gained public favor as insurers try to endear themselves to the market but at the same time try to avoid or minimize possible financial losses (Gupta, 2011). This literature also considers health promotion strategies where risk reduction is carried out through the provision of bonuses like discounts for membership with exercise facilities or health check-ups. These programs were meant to better maintain the health and well-being of insured individuals to ensure overall claim costs are minimized in the long run. Another major discussion area is

regulation, affecting risk management and derivative instruments. Scholars seek to call for moderate touch regulations without restricting innovation to achieve market stability and protect consumers (Eikenhout, 2015) Derivatives play a critical role in risk management, wherein risk management lobby or financial instruments that many businesses, investors, and institutions may use in managing market risk, interest rate risk, exchange rate risk, and commodity price risk. Options are the contracts whose price is based on an underlying asset, and the future is an agreement through which participants can buy or sell an object at a certain time, opening up, hedging, or accepting certain exposures depending on how they are affected by the different risks. (Gatzert & Kolb, 2014) A synthesis of literature on these subject reveals that futures, options, swaps, and forwards are widely used to hedge price risks, and the use of these instruments enables the specification of cash flows in the future with stability. Notably, the pricing models for options offer useful information to the management of equity price risk. While the broader insurance industry has increasingly leveraged capital market innovations to supplement traditional risk transfer methods, the health insurance segment presents a distinctive case due to the nature and volatility of its underlying risks. Derivatives as a mechanism for transferring non-financial risks have been examined in insurance scholarship, notably in Prakash Shimpi's Insurative Model, which integrates traditional insurance with capital market

solutions to distribute risk across a wider spectrum of participants (Shimpi, 2001). Within the health insurance sector, this approach is particularly pertinent due to its exposure to volatile and high-impact uncertainties, such as pandemics, the emergence of new infectious diseases, demographic transitions, and sudden surges in medical costs. Unlike property and casualty or life insurance—where risks are comparatively more predictable and where reinsurance markets are well developed—health insurers encounter loss events that are less diversifiable and more difficult to hedge using conventional tools. In such contexts, disease-linked derivatives, health cost index futures, or epidemic bonds could allow risk transfer to counterparties that might include institutional investors seeking portfolio diversification, other insurers with offsetting exposures, or speculators with no direct insurable interest, like participants in event-driven betting markets. Although speculative involvement may invite ethical and regulatory scrutiny, it can simultaneously enhance market liquidity, which is essential for the viability of such instruments. Nevertheless, implementing these products presents operational hurdles, including appropriate contract structuring, regulatory compliance, counterparty credit assessment, and mitigation of moral hazard. Where immediate solutions are not feasible, the design of sustainable counterparty frameworks for health-related derivatives represents a critical area for further investigation. The literature on the

utilization of derivatives for hedging purposes is extensive, and research analyze the application of financial derivatives with the aim of proving that appropriate use of derivatives in hedging or risk management of financial portfolios is a sound approach. At the same time, the abuse and misuse of derivatives have been cited as a source of systematic risk and financial unsoundness in the literature. The 2008 financial crisis evidence show over leveraging and failure in risk management with derivative simplified the generalized financial market chaos (Mavalankar & Bhat, 2000). More recently, others have looked at derivatives in the context of their application in corporate finance in a capital budgeting and risk-adjusted return context. Some literature focuses on the good side of using derivatives for risk management, while other literature that surfaces subsequently throws light on the bad side. On the one hand, derivatives offer structures to the entities in order for these to guard themselves against numerous risk exposures and consequently, offer better surety and stability of returns. (Aggarwal et al., 2013) For instance, to reduce currency risk impact on the organization's international revenues or expenses, MNCs always use forwards and options. The floating-rate debtors who wish to swap their debt to a fixed-rate interest rate can do so with the help of interest rate swaps, thereby paralyzing themselves from interest rate risk (Palande et al., 2003). In the same way, sellers and buyers of commodities use futures and options on commodities as the way to set prices and to hedge

prices. On the other hand, the possibility of derivatives being used for managing risks is best understood based on the competency of the user in identifying potential risks related to the instruments of derivatives. (Tyagi & Tyagi, 2007)

Analysis and Discussion

Some of the main risks in the insurance sector are related to claims volatility, where unpredictable flows of claim amount due to unpredictable natural health crises or large-scale health events stress the financial resources of an insurer. Here, with the help of derivatives, insurers can hedge against the same fluctuations and stabilize cash flow and financial performance. (Pal, 2007) In interest rate terms, the other relevant risk is the type caused by interest rates, as health insurers most probably have long-term liabilities in terms of policyholder claims, while the returns on their investments are sensitive to changes in interest rates. Interest rate derivatives in the form of swaps can be used to level asset-liability durations to reduce the impact of rate changes on overall profitability. (Mishra & Mishra, 2011) Another issue is inflation risk, because the cost of medical care tends to increase with time, possibly at a higher rate than the premium increase. Inflation-indexed derivatives allow insurers to hedge against the adverse effects of increased costs on their bottom lines. By using such derivative instruments, health insurers are in a better position to manage their financial exposure and hence have a sounder platform for policyholder obligations and financial soundness. (Tripathy & Pal, 2005)

Figure 2 common risk in the insurance industry



Source: - [Faster Capital](#)

Derivative products, such as interest rate swaps, inflation-linked swaps, and options, might be useful for risk mitigation in the health insurance sector because financial exposures are quite complex. For instance, an interest rate swap allows the insurer to change variable-rate payments into fixed-rate payments, stabilizing cash flows and reducing the impact of volatile interest rates. This assists insurers in handling long-term liabilities, which keeps their assets even more in tandem with the expected policy payouts. Inflation-linked swaps are other excellent products that would help protect against compounded healthcare cost inflation, going further than premium revenue. Insurers can hedge against inflationary pressures from apparent medical expenses, thereby reducing profitability and capital reserves. Options offer flexible protection by hedging insurers against adverse price movements and reserving

possible gains. The strategic incorporation of such derivatives helps health insurers control financial risks related to interest rates, inflation, and so on, thereby creating a sounder financial structure and protecting against uncertainty with supportive growth.

Figure 3



Source: [Derivatives and Risk - FasterCapital](#)

Indian Regulatory Landscape

The entire derivative usage in India's insurance industries is regulated through both the IRDAI and SEBI. This is because the IRDAI provides guidelines to the insurance industry regarding applying derivatives mainly for hedging rather than speculative purposes. (Krishnan, 2011) This would only be possible if insurance companies' risk is mitigated without financial instability, and the main mission of the IRDAI comes to an end. However, caution should be exercised in the regulatory terms. IRDAI has put very stringent controls on the variety and extent of derivatives permitted, mainly interest rate and currency derivatives, and not exactly options related to direct health outcomes or cost structures (Gulati, 2009).

Figure4: Current Policies Affecting Derivative Usage in Health Insurance



Source: [Derivatives and Risk - FasterCapital](#)

Currently, policies that affect the use of derivatives in health insurance in India are primarily based on risk containment and financial stability. According to the IRDAI guidelines, insurers can employ derivatives for risk management purposes and not for speculative trade. All derivative transactions should be reported to ensure transparency and compliance with financial laws (Ouvreille, 2012)

The corresponding health insurers in India can resort to the use of specific types of derivatives like interest rate swaps and currency futures while hedging against fluctuations that may affect the cost structure; IRDAI must mandatorily use only regulated, exchange-traded derivatives, which limits counterparty risks (Aggarwal et al., 2013). The IRDAI further tightens restrictions on hedging requirements to the extent that derivatives should be used only to offset clearly identifiable liabilities rather than gaining independent benefits. Health insurers may hedge inflationary risks or interest rates, but they need to be careful about the magnitude and time of the derivatives position so as not to over-hedge (Müller & Grandi, 2000). The current regulatory requirement is that insurers should be well-capitalized to absorb whatever losses result from their exposure to derivatives. Thus, health insurers need to periodically review their risk profiles associated with their portfolio of derivatives, keeping it in line with the overall risk management strategy. Transparency is the basic principle by which health insurers use derivatives. Insurance companies, through regulators, are required to make known the use of derivatives

to regulatory bodies as well as shareholders in objectives, risks, and outcomes. (Chance & Brooks, 2021). As such, regulatory policies in India have proven to be a balancing act between the desired benefits of the use of derivatives and the imperative to maintain an insurer's stable and solvent market, more so in view of the quantum growth in health insurance demand and costs over the past few years. (David Cummins et al., 1997)

Evaluation of Market Depth, Liquidity, and Expertise in Derivatives

While India has commenced trading in derivatives in select segments such as the equity and currency derivatives market, which is relatively highly developed, there are other derivative segments that are still in the initial stages of development for the health insurance industry (Møller, 2002). Evaluating the possibility of using derivatives in hazard management solutions within health insurance demands, recognizing the market's depth and liquidity, and the existing derivative proficiency. The derivatives market in India has been developing rapidly, particularly regarding the growing activity of NSE and BSE derivatives (Persaud, 2004). However, the depth of levels of health insurance-relevant derivatives remains restricted. Thus, cost insurers are especially concerned with hedging against inflation in healthcare fees or an unfavourable shift in the healthcare market; nonetheless, the hedge instruments are few. The primary instruments in traditional activities are

equity, currencies, and commodities that are not well suited to the specific requirements of a health insurer. (Cummins et al., 2001)

Finally, we investigate the role of liquidity in derivatives markets for insurers trying to hedge risks without incurring high transaction costs. The equity and currency derivatives markets are relatively liquid because of the large trading volumes and active involvement of domestic as well as international institutional investors. (Manns, 2012) However, the essential structures for other less frequent derivatives that could fit more health insurers' risk characteristics, such as interest rate derivatives or inflation-indexed swaps, are less liquid. Such a position had the potential to slow down the ease with which Health Insurers could trade in positions, more so during periods of high volatility in financial markets (Poitras, 2002). The profile of trading and risk management of derivatives has also evolved in India over the past decade; however, the skill set for using them within the context of insurance risk management solutions is still lacking. Although many large financial organizations operating in India, such as life insurers, have dedicated professionals in derivative trading, health insurers are often found to have limited internal capacity for derivatives structuring and risk analysis, as they have not experienced high levels of derivative-related trading in the past (Schwartz & Smith, 1997).

However, due to the current lack of depth and turnover in health-related

derivatives, and because of the specialism required in this area, the potential for the expanded use of derivatives in the health insurance industry is limited (Poitras, 2002). However, as the market grows deeper and more health-related instruments emerge, the health insurance market may gradually integrate the use of derivatives into their market risk management mechanisms. Furthermore, the involvement of regulatory bodies and insurance companies, as well as financial institutions to improve training and to work on the creation of derivatives on specific sector products, may open promising opportunities to increase the level of risk management of insurance health (Hentschel & Smith Jr, 1997). Therefore, for market readiness and feasibility for the health insurance industry to engage in derivative-based risk management effectively, the Indian derivatives market should focus on certain issue areas that include Liquidity, Product Development and Expertise in the application of derivatives specifically in the health insurance domain.

Policy Suggestions to Support Derivatives-Based Risk Management for Health Insurers

Given the potential benefits of derivatives in mitigating specific risks in the health insurance sector, targeted policy changes could enhance the capacity of Indian health insurers to incorporate these instruments into their risk management strategies. The IRDAI could consider allowing health insurers to use derivatives other than interest rate, currency, inflation, and

disease-linked derivatives (Jarrow, 2021). Avenue, whose coverage depends on the level in the chain linked to an HC cost index – inflation-indexed swaps or derivatives – would enable health insurers to hedge directly against the threat inflation poses to the medical and associated health insurance expense line. To stimulate the functioning of a liquid market for health-relevant derivatives, regulatory authorities might increase the market's activity. (Brockett et al., 2005) For instance, the provision of suitable incentives to institutional investors, such as pension funds or asset managers, might boost the trading of health insurance-relevant derivative products. Moreover, 'certified' market makers sponsored by the government may be used to provide insurers with adequate counterparties in the corresponding specialized markets to hedge their risks. (Ahlgren, 2003)

The IRDAI, along with financial institutions and academic bodies, can develop relevant training programs concerning risk management using derivatives, especially in the insurance industry. Such programs would fill the gap in the existing knowledge in health insurance companies regarding the valuation, structuring, and management of derivatives (Briys & De Varenne, 2001). They could involve seminars, training, and dramatizations to ensure that the implementing organization has a pool of multi-talented employees. The use of healthcare cost indices that can be developed in the form of, for instance, the Health Cost Inflation Index means that

health insurers could follow changes in costs related to healthcare and employ derivative tools linked to such indices. These indices could be designed by SEBI, IRDAI, and other similar authorities and will form a sound platform for framing derivative products that are more in sync with the underlying health insurance costs. (Chaplin, 2005) However, to enhance safe and proper usage of derivatives, the regulatory authorities need to enhance the obligatory disclosures on the derivative transactions. (El-Masry, 2006) Insurers should disclose both the level of their derivative exposure and also the use for which they were undertaken, whether it was for purposes such as inflation hedges, currency risk management, and the expected results in these areas. (Whaley, 2006) This would improve upon the actual utilisation of derivatives in companies through risk management, thereby improving the monitoring by the regulators and boosting the level of assurance given to derivative users. (Alam et al., 2007)

Conclusion

Altogether, the application of derivatives in the health insurance sector in India hints at probable gains in the management of risks such as cost with special reference to their inflation together with other financial risks. Such key findings suggest that despite growth in the derivatives market in India, certain market imperfections in liquidity, product availability, and skill make it possible to adopt derivatives use in health insurance difficult. Derivatives may have the following advantages: financial soundness

and risk management enhancement, but health insurance-derived limitations consist of regulatory issues and operational challenges. A range of potential benefits from the perspective of insurers include improved capacity to control risks should there be changes in regulatory systems regarding derivatives; the need for policymakers to strike the

balance of encouraging innovation with a view towards prudent risk management; and finally, financial institutions greatly contributed through the provision of suitable products and the development of an active market in such products. There is potential for increased studies related to the application studies of the use of derivative instruments in

health insurance and the efficiency of derivative contracts in management and mitigation of medical cost risks and other specific risk factors pertaining to the sector in India. To this end, empirical research would offer a way of using facts to inform policy and practice with reference to a more solid firm in the health insurance section. **TD**

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Measure of Compensation under the Employees Compensation Policy



Gayathri S Iyer

gayathri120501@gmail.com

Having over 36 years of experience in the General Insurance Industry. DGM in National Insurance Company .Ltd. Presently at National Insurance Academy on deputation.

Abstract

The Employees Compensation Act 2010 (Erstwhile Workmen's Compensation Act 1923) speaks of the Liabilities of the Employer, whenever an Employee is injured/ dies in the course of employment. General Insurance Companies cover this liability through the Employees Compensation Insurance Policy.

The aspect of Compensation to be awarded to the deceased/injured employee, varies between Courts. Moreover, the liability of the Employer under the Act is not akin to the Liability of the Insurance Company under the Insurance Policy. The Liability under the Policy is subject to conditions and warranties and the extent of coverage selected by the Employer /Insured.

This article is aimed at addressing the diversity of approach by Employers, Insurance Companies and the Legal machinery in addressing this Social Issue.

Keywords

Wages, Employer, Compensation, Employee, Minimum, Maximum.

References

- The Workmen's Compensation Act 1923
- The Employees Compensation Act 2010
- Various Notifications by the Government on 'Wages'
- Some relevant legal cases (mentioned against each case)
- Part I of this Article seeks to examine the journey of the Workmen's Compensation Act 1923 through the last century.
- Part II of the Article examines the co-relation between the legislation and the Employees Compensation Insurance offered by Insurance Companies

PART I

Measure of Compensation under The Employees Compensation Policy

Technological advancements increase the complexity of Industries. Workers and Employees are exposed to many new perils at the workplace.

Prudentially, every Government body should ensure that the Workers and Employees (many of whom are already in a situation of hand to mouth existence) are adequately protected for the tortuous liability of the Employers.

The Workmen's Compensation Act 1923 (Act 8 of 1923) was passed to earmark the Liabilities of the Employers, towards their Employees for bodily injury and death, sustained by the employee in the 'Course of Employment'. This Act is one of the Social Security and Welfare legislations. It is necessary that the Workman is compensated expeditiously and at minimum costs to his account. Thus, the Workmen Compensation Tribunals headed by the Commissioners render judgements determining the liabilities of the Employer, in cases of injury or death to the Workman/Employee, in the 'course of employment'. **The provisions of the 1923 Act subjected the amount of compensation to both minima and maxima.**

The relevant Sections of the Workmen's Compensation Act

1923, indicating the amount of compensation payable is explained below.

It is pertinent to note that the compensation payable is supposed to be calculated on the average wages drawn by the employee during the period of service OR THE MAXIMUM WAGES PRESCRIBED IN THE ACT, which was revised from time to time. Let us refer to the relevant section of the Act.

Chapter II Section 4 speaks about the amount of Compensation payable by the Employer to the Employee in case of an Accident or affliction of Occupational Disease.

1. In case of Death, the entitled legal heirs of the employee shall be paid fifty percent of the monthly

wages of the deceased employee multiplied by the factor based on the age (completed years of age on last birthday) of the deceased employee, as specified in the second column of Schedule IV of the Act. (revised from 40 % to 50 % in the year 1995)

2. In case of Permanent Total Disablement, the employee shall receive sixty percent of the monthly wages of the employee, multiplied by the factor based on the age (completed years of age on last birthday) of the injured employee as specified in the second column of Schedule IV of the Act. (revised from 50 % to 60 % in the year 1995)
3. In case of Permanent Partial Disablement, the percentage of

disablement as certified by the Surgeon shall be applied on the amount of compensation for Permanent Total Disablement (As arrived at under point No 2 above)

4. For Temporary Total Disablement above three days, half monthly payment for the period of disablement is payable at the rate of twenty five percent of the monthly wages (Limited to a Maximum period of 5 years).

It is pertinent to note that the Amount of Compensation payable to an affected employee/legal beneficiary has undergone change from time to time, based on the inflationary trend prevalent. This is enumerated in the table below.

Act/Amendment	Compensation for Death	Compensation for Permanent Disablement	Maximum Wages that can be considered as per Explanation II
WC 1923	40% of the monthly wages multiplied by relevant multiplier subject to minimum of Rs. 20000	50% of the monthly wages multiplied by the relevant multiplier subject to minimum of Rs. 24000	Rs, 1000
1995	50% of the monthly wages multiplied by relevant multiplier subject to minimum of 50000	60% of the monthly wages multiplied by relevant multiplier subject to minimum of 60000	Rs. 2000
46 of 2000	50% of the monthly wages multiplied by relevant multiplier subject to minimum of 80000	60% of the monthly wages multiplied by relevant multiplier subject to minimum of 90000	Rs 4000

The Act underwent major changes in the year 2010, when the revised Employees Compensation Act replaced the Workmen's Compensation Act. The compensation payable underwent the following changes.

Act/Amendment	Compensation for Death	Compensation for Permanent Disablement	Wages notified through gazette notification
2010	50% of the monthly wages multiplied by relevant multiplier subject to minimum of 120000	60% of the monthly wages multiplied by relevant multiplier subject to minimum of 140000	Notification dated 31 st May 2010 of Rs. 8000 as wages. Explanation II on ceiling on wages deleted
2020	50% of the monthly wages multiplied by relevant multiplier subject to minimum of 120000	60% of the monthly wages multiplied by relevant multiplier subject to minimum of 140000	Notification dated 3 rd January 2020 of Rs. 15000 as wages

It is pertinent to note that with reference Section 4 of Chapter II regarding the Wages that was hitherto considered for arriving at the compensation, the Amendment Act in 2010 had the following changes.

1. Minimum compensation for Death and Permanent Disablement was increased from Rs. 80000/- and Rs. 90000/- to Rs. 120000/- and Rs. 140000 respectively.
2. Explanation II, under this section which read as follows was deleted.

Explanation II.. Where the monthly wages of a workman exceed ----- rupees, his monthly wages for the purposes of clause (a) and clause (b) shall be deemed to be ---

3. The following clause was added
[(1B) The Central Government may, by notification in the Official Gazette, specify, for the purposes of sub-section (I), such monthly wages in relation to an employee as it may consider necessary;]

Accordingly, notification was passed 31st May 2010, which read as follows.

MINISTRY OF LABOUR AND EMPLOYMENT NOTIFICATION New Delhi, the 31st May, 2010 S.O. 1258(E).-

In exercise of the powers conferred by sub-section (I B) of Section 4 of the Employee's Compensation Act, 1923 (8 of 1923), the Central Government hereby specifies, for the purposes of sub-section (I) of the said section, the following amount as monthly wages, with effect from the date of publication of this notification in the Official Gazette, namely :-

"Eight thousand rupees"

[F. No. S-370 12/I/2008-S.S.-I (Vol. mJ S. K. DEV YERMAN, Jt. Secy

The Wages to be considered for compensation was once again revised vide Notification dated 3rd January 2020, which read as follows.

MINISTRY OF LABOUR AND EMPLOYMENT NOTIFICATION New Delhi, the 3rd January, 2020 S.O. 71(E). —

In exercise of the powers conferred by sub-section (1B) of section 4 of the Employee's Compensation Act, 1923 (8 of 1923) and in supersession of the notification of the

Ministry of Labour and Employment issued vide number S.O. 1258(E), dated 31st May, 2010; published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), dated 31st May, 2010, the Central Government hereby specifies, for the purposes of sub-section (1) of the said section, the following amount as monthly wages, with effect from the date of publication of this notification in the Official Gazette, namely:-

"Fifteen thousand rupees

[F. No. S-37025/03/2016-SS-I] VIBHA BHALLA, Jt. Secy.

It may be noted that the Notification simply mentions that the wages of the said amount has been specified.

There is no clear advice that this shall be the ceiling for working out the compensation, as stated in the erstwhile Explanation II stated above.

To understand the intention of deleting Explanation II and inserting the gazette notification for wages, we need to examine the objectives of the Committee which resulted in the amendments to the Act in 2010.

With this view, the THIRTY-SEVENTH REPORT STANDING COMMITTEE ON

LABOUR (2008-09) (FOURTEENTH LOK SABHA) MINISTRY OF LABOUR AND EMPLOYMENT, THE WORKMEN'S COMPENSATION (AMENDMENT) BILL, 2008 Presented to Lok Sabha on 19th December, 2008 Laid in Rajya Sabha on 19th December, 2008, has been referred to.

The reasons stated by the Committee for amendments to the Act had the following objectives.

The Bill seeks to provide

- (i) For substitution of the word 'workman' with the word 'employee' so that the Act is applicable to all classes of employees and to make the expression gender-neutral,
- (ii) To re-name the Workmen's Compensation Act, 1923 as the Employees Compensation Act, 1923,
- (iii) To omit restrictive clauses in Schedule II of the Act, to make it more workers friendly,
- (iv) To have an enabling provision to revise the **wage ceiling from time to time** by the Central Government keeping in view the changing trend in the wage level of employees,
- (v) To enhance the funeral expenses of the deceased workman from Rs. 2500/- to Rs. 3000/- and also to empower the Central Government to enhance such expenses from time to time, and
- (vi) To effect changes in the eligibility criteria of persons to become Commissioner.

It is clear from point no (iv) that the intention of the committee was to place a ceiling on wages through notifications.

However, it is generally observed that there is no clarity on this matter. Different Courts adopt different practices, and judgements vary from Court to Court. Some of the judgements are enumerated below.

1. *In the case of United India Insurance Co Ltd vs Sri Nagendra on 12 April, 2022, the Learned judge has considered the wages of Rs. 8000/- (as per the Notification dated 31st May 2010) for calculation of compensation even though the wages declared by the petitioner was Rs. 6000/-*
2. *In C.M.A.No.377 of 2021 Sudhakar V/s Royal Sundaram, the Honourable Justice has considered wages above the notified wages of Rs. 8000/- , In the aforesaid case, the Honourable Justice observed as follows.*

Prior to Act 45 of 2009, by virtue of the deeming provision in Explanation II to Section 4, the monthly wages of an employee were capped at Rs.4000/- even where an employee was able to prove the payment of a monthly wage in excess of Rs.4000/-. The legislature, in its wisdom and keeping in mind the purpose of the 1923 Act as a social welfare legislation did not enhance the quantum in the deeming provision but deleted it altogether. The amendment

is in furtherance of the salient purpose which underlies the

1923 Act of providing to all employees compensation for accidents which occur in the course of an arising out of employment. The objective of the amendment is to remove a deeming cap on the monthly income of an employee and extend to them compensation on the basis of the actual monthly wages drawn by them.

3. *In the M/S.Vivek And Co vs N.Ravi on 12 February, 2021, in the High Court of Madras, the Honourable Justice observed as follows.*

Adopting the conventional procedures, the minimum wages are fixed by the State and Union for the purpose of fixing the monthly income. Undoubtedly prior to 18.01.2010, the date on which the amendment was issued, the deeming cap was in force and as per the deeming cap, a sum of Rs.4000/- was fixed as a monthly income. However, in the amendment dated 18.01.2010, such a deeming cap was removed and the Supreme Court also interpreted in the case of K.Sivaraman and Ors Vs.Sathish Kumar and Anr, cited supra that such deeming cap on the monthly income of the employee was removed from the amendment. Therefore, the actual monthly wages of the employee is to be taken into account

for grant of compensation. Therefore, the employee is at liberty to establish his monthly income by submitting documents and evidences. Once an employee is able to establish his monthly income with an acceptable evidence, then, such monthly income is to be taken into consideration for the purpose of <https://www.mhc.tn.gov.in/judis/> quantifying the compensation. In the cases where there is no proof is available, then, the **minimum wages notified by the Central Government under Section 4(1B) is to be taken into account.**

Thus, the object of fixation of monthly wages by the Central Government, is to ensure that the employees are not discriminated or to avoid discrepancies in quantifying the compensation. The authorities may have their own notions and approaches in the matter of fixation of monthly income. Such fixation cannot be at the discretion of the competent authorities. In the event of unguided discretion, there are possibilities of discrepancies and denial of justice to the workmen. That is the reason why the Central Government thought fit to issue notification regarding the minimum wages to be fixed for grant of compensation. The fixation of minimum wages under Section 4(1B) has got a definite object. The very object would be

to eradicate the discrimination and inconsistencies in the matter of fixation of monthly income. However such fixation would not deprive the workmen from getting higher compensation based on his actual income if he is able to establish the monthly income with acceptable evidence

4. We may refer to K. Sivaraman v. P. Sathishkumar¹² wherein, speaking for the Court, Dr. D.Y Chandrachud J., observed: – “25. The 1923 Act is a social beneficial legislation and its provisions and amendments thereto must be interpreted in a manner so as to not deprive the employees of the benefit of the legislation. The object of enacting the Act was to ameliorate the hardship of economically poor employees who were exposed to risks in work, or occupational hazards by providing a cheaper and quicker machinery for compensating them with pecuniary benefits. The amendments to the 1923 Act have been 12 (2020) 4 SCC 594 14 enacted to further this salient purpose by either streamlining the compensation process or enhancing the amount of compensation payable to the employee.

In view of varied interpretations, it is felt that the Compensation payable to an employee or his legal heirs injured or deceased due to an accident/ occupational disease contracted in the course of employment needs to be revisited. The following points are

highlighted and needs to be pondered upon.

1. Whether the wages notified through periodic notifications as stated in lieu of erstwhile Explanation II Section 4 of Chapter II of the Act (amended in 2010), are the “Minimum Wages” or ‘Ceiling’.
2. If they are ‘Minimum Wages’, the relevance of the minimum amounts of Rs. 120000/- and Rs. 140000/- for Death and Disablement respectively, specified in the beginning of the aforesaid Section.
3. Whether there is any ceiling to be considered for Wages or even Employees earning high income like Software professionals can avail of the Workmen’s Compensation Tribunals for compensation. It is pertinent to note that “The object of enacting the Act was to ameliorate the hardship of economically poor employees who were exposed to risks in work, or occupational hazards by providing a cheaper and quicker machinery for compensating them with pecuniary benefits”.
4. Whether broadening the scope of the Act to include high income individuals shall dilute the social objective of granting justice to the economically poor and illiterate.

To ensure proper justice, and achievement of social objectives, it is important to have uniformity in perception and approach.

Another remarkable amendment is on Medical Expenses caused during the course of employment. The Old Act did not have a mention on this aspect. The new Employees compensation Act makes the employer liable for Medical expenses arising out of injuries during the course of employment under Sec.

[(2A) The employee shall be reimbursed the actual medical expenditure incurred by him for treatment of injuries caused during the course of employment.]

It is pertinent to note that there is no limit specified for this and it states 'Actual expenses'

PART II

Insurance cover to employers for their liability under the Workmen's Compensation Act 1923 presently, the Employees Compensation Act 2010.

The Workmen's Compensation Act was aimed at determination of the liabilities of the EMPLOYER towards his EMPLOYEES, due to death or disablement arising out of any accident or occupational diseases occurring or contracted during the course of employment.

Prior to the reforms of 1999 in the Insurance Sector, Public Sector Companies covered Employees for their liabilities towards employees, under the Workmen's Compensation Act 1923. The Terms of coverage including the premium, coverage exclusions and conditions were as per the Workmen's Compensation Tariff.

Salient features of the WC Tariff coverage were as follows.

1. The Tariff provided for two forms of insurance viz :-

Table 'A' - Indemnity against legal liability to all employees (whether or not coming within the definition of the term Workmen) under the W.C. Act 1923 and subsequent amendment to the said Act prior to the date of issue of the policy, the Fatal Accidents Act, 1855 and at Common Law."

Table 'B' - Indemnity against legal liability under the Fatal Accidents Act, 1855 and Common Law. (Table 'B' policies may not be issued to cover employees who fall within the definition of "Workmen" under the Workmen's Compensation Act, 1923 as amended).

2. All Employees needed to be included. If only a particular class of employee was to be covered, all within that class had to be included
3. Employees coming within the purview of Employees State Insurance Act, were not eligible for a policy under the WC Tariff.
4. There is a mention of covering 'Domestic Servants' in point no 6 of the tariff.
5. Medical extension for a small amount of Rs. 2500/- was given as an extension
6. Contractors employees could be included by way of specific mention

7. Occupationwise rates were prescribed in the tariff
8. For wages upto Rs. 12000/- per employee, the prescribed rate was to be charged. For wages above Rs. 12000/- a discounted premium rate of 6.25% of the applicable rate was to be charged.
9. Likewise warranties pertaining to specified trades were also mentioned
10. Separate Proposal forms for specialized forms of units like collieries etc
11. The policy wordings were prescribed in the tariff.
12. The Operative Clause read as follows.

NOW THIS POLICY WITNESSETH that if at any time during the period of Insurance any employee in the Insured's immediate service shall sustain personal injury by accident or disease arising out of and in the course of his employment by the Insured in the Business and if the Insured shall be liable to pay compensation for such injury either under :

the Law(s) set out in the Schedule

or at

Common Law

then subject to the terms exceptions and conditions contained herein or endorsed hereon the Company will indemnify the Insured against all sums for which the Insured shall

be so liable and will in addition be responsible for all costs and expenses incurred with its consent in defending any claim for such compensation

13. The Schedule was as follows

Indemnity under the Workmen's Compensation Act 1923 and subsequent amendments of the said Act prior to the date of the issue of the Policy; the Fatal Accidents Act, 1855; and at Common Law

14. The policy had a premium adjustment clause which indicated adjustment of premium (either additional collection or

balance refund) based on the actual wages paid.

PRACTICE OF THE INSURANCE COMPANIES

1. The practice adopted by all Insurers was to advise the Insured Employer to calculate the amount payable based on the multiplier and **Actual Wages** paid subject to the maximum wages prescribed in the Act .
2. Based on Policy terms and conditions and exclusions thereof, and the documents submitted by the Insured Employer that is Attendance

Register, Age of the deceased/ injured employee, Wage receipt etc, the liability under the policy would be worked out and reimbursed to the employer.

3. In cases of death and permanent disablement, the Insurance Company would at their discretion, themselves deposit the amount with the Commissioner provided liability was undisputedly admitted under the policy

The Policy got amended in 2012 based on the amendments to the Act in 2010. The changes effected were as follows.

The amendments can be tabularized as follows.

Sr No	Heads	Workmens compensation policy	Employees compensation policy
1.	Nomenclature	Known as Workmens Compensation policy	Name changed to Employees compensation policy
2	Coverage	Compensation and defence costs under laws stated in the schedule and also Common law	Word 'Common law' deleted.
3	Limit of Indemnity	Not specified	In the column of Definitions, Limit of Indemnity defined. Limit of Indemnity means the maximum amount of indemnity as specified in the Schedule that will be provided under this Policy by the Company in respect of a) any particular claim by an Employee and b) all claims arising out of all accidents for any number of Employees during the Period of Insurance. For covering common law, the Insured employer had to select a Per Accident and Per Year limit of Sum Insured to be covered.
4	Premium Adjustment Clause	Present	Premium Adjustment Clause not present. However, Condition of average imposed vide Clause No 9
5	Contribution	Not present	Present
6	Medical Expenses extension	Was limited to Rs. 2500	Though the Act has laid no limits, the Insurance Companies have their own limits and rates for the medical extension cover.

The above differences can be summarised as follows.

1. The nomenclature was changed from Workmen's compensation to Employees Compensation
2. For Common Law, the Employer has to select a Separate limit of indemnity per accident and per year.
3. Medical expenses extension can be obtained for higher limits per person and per accident
4. CONDITION OF AVERAGE IMPOSED (Based on Wages/ No of employees).

Broad aspects which need to be perused and reviewed by Insurance Companies.

1. By virtue of the Condition of Average, it is pertinent to note that our liability under the policy based on the contract of insurance with the employer, is different from the employer's liability under the Act
2. Many a times, the Employer simply hands over the EC Policy to the WC Court and the Insurance Company is made a party to the case. We all are aware that EC Policy is an optional policy and we do not **step into the shoes** of the employer like a motor TP policy. The EC Policy is an indemnity policy with limited liability (Based on that agreed in the contract of insurance). This aspect needs to be brought to the attention of the WC Commissioners so that



Insurance Companies are not saddled with liabilities in excess of what is contracted in the EC Policy.

3. The aspect of whether the notified wages (presently Rs. 15000) is the maximum or minimum needs to be clarified so that the Sum Insured under the policy can be arrived at appropriately.
4. Interest and penalties if any should be to the books of the employer as the same is specifically excluded under our EC Policy. However, awards are passed against Insurance Companies with interest and penalties to be borne jointly and severally.

Insurers need to come together to discuss and understand the implications of

- a. Changes in the Act as specified in Part I of this Article
- b. Changes already brought about in the Policy terms

- c. Relevance of the trend of the Tribunals, Clarification on various issues raised above and the changes that need to be brought about in the Policy as well as the procedure of Claim settlement.
- d. Do we have the appetite to cover Employers Liability under any Act or Jurisdiction like under a CGL Policy.

These aspects need to be discussed and clarified so that there is uniformity of procedure, uniformity in the compensation paid to the affected employee and also ensure that the social objective is achieved. **TJ**

Literature Review Research: Use of Artificial Intelligence and Blockchain Smart Contracts in Insurance Industry



Dr. Kaustubh Vasant Gholap

drkvg21@gmail.com

Associate Senior Manager – Health Claims Management, Bajaj Allianz General Insurance Co. Ltd., Pune

Experience: 15+ years in health insurance, specializing in claims management, underwriting, and product development

Key Skills: Health insurance claims processing, underwriting, regulatory compliance, product development, stakeholder management, fraud analysis, and team leadership

Education: • **PhD (Ongoing)** – Pune University (2022 – Present)

• **MBA** – IGNOU, Delhi (2015 – 2017)

Abstract

The combination of block chain technology with artificial intelligence (AI), especially with the use of smart contracts, is set to revolutionize the insurance sector. The present uses, advantages, and difficulties of applying AI and blockchain smart contracts in insurance are examined in this overview of the literature. According to the research, blockchain contributes to increased security, transparency, and efficiency in the daily operations of insurance contracts, while artificial intelligence (AI) improves client data processing, personalized risk assessment, and superior customer service. Blockchain-powered smart contracts make it possible to automate claim processing and lessen the need for manual claim processing. The study also looks at the obstacles to adoption, such as market preparedness, technological

complexity, and regulatory issues, while emphasizing areas that could use more research and development.

Keywords

“Insurtech”, “Artificial Intelligence (AI)”, “Blockchain”, “Smart Contracts”, “Health Insurance”

Introduction

The insurance sector is changing quickly in reaction to technological breakthroughs. Innovations like blockchain and artificial intelligence (AI) are progressively improving traditional procedures because they offer increased consumer happiness, security, and efficiency. AI has been crucial in improving underwriting and claims processing, forecasting client demands, and simplifying data analytics. In the meantime, blockchain technology—which is renowned for its safe and unchangeable record system—is becoming more popular due to its

capacity to protect private information and enable open transactions. Specifically, the industry’s methods for managing policy, processing claims, and conducting transactions are being redefined by smart contracts enabled by blockchain technology.

Blockchain and AI integration in the insurance sector is still in its infancy in India, despite the potential. In order to give a thorough picture of the current situation, this literature review will examine both the real-world uses and the obstacles to broad adoption. This article covers the areas where AI and Blockchain technologies are now having an influence and identifies research gaps by looking at previous studies and case studies. The evaluation clarifies how these technologies can open the door to a more customer-focused, safe, and effective insurance sector through this examination.

Theme	Articles	Comparison Notes
Automation & Operational Efficiency	Article 1 (Mittal), Article 3 (Rajani), Article 4 (Ganapathy)	Discuss how tech reduces manual tasks and turnaround times. Mittal focuses on blockchain; Rajani & Ganapathy emphasize multi-tech approaches.
AI & Hyper-Personalization	Article 2 (Nangla), Article 3 (Rajani), Article 4 (Ganapathy)	All three highlight AI's role in decision-making. Nangla is health-specific; the others apply to broader sectors.
Transparency & Trust via Blockchain	Article 1 (Mittal), Article 3 (Rajani), Article 4 (Ganapathy)	Blockchain is central to smart contracts and fraud reduction. Rajani adds insights into ecosystem partnerships.
Rural Inclusion & Sustainability	Article 3 (Rajani), Article 5 (Pallavi & Manoj)	Focus on underserved markets. Pallavi emphasizes outreach via digital platforms, Rajani on Insurtech's potential.
Disruptive Business Models / Insurtech Evolution	Article 3 (Rajani), Article 4 (Ganapathy)	Emphasis on startup-driven innovation, platform models, and strategic alliances with insurers.

Table 1:- Theme based article summarization

The following are the five research papers that were selected for this critical literature review:

Article 1: 'Using Blockchain Smart Contracts to Drive Service Excellence in Insurance Sector' by Monica Mittal and Anina Bhattacharjee

Summary

In brief The application of blockchain smart contracts to streamline insurance processes is examined in Mittal and Bhattacharjee's work, which was published in The Journal of Insurance Institute of India (Jan–Mar 2018). It highlights significant inefficiencies in contract lifecycle documentation, claims management,

and KYC/AML procedures and suggests blockchain as a remedy.

Blockchain is defined as a distributed, immutable ledger at the beginning of the paper. Smart contracts, which are programs that run on their own when certain circumstances are met, are presented as a way to automate and secure transactions. Three main use cases are covered: monitoring claims, storing policy documents, and centralized KYC via blockchain-based third-party verification.

Synthesis

The subjects of the paper are in line with international research on blockchain's use in insurance:

- **Tamper-Proof Documentation:** Mainelli & Manson (2016)

highlight how blockchain makes it possible for documents to be secure and verifiable. These advantages in managing policy and claims documentation are echoed throughout the article.

- **Efficiency and Cost Reduction:** The authors emphasize how blockchain reduces manual interventions, decreases overhead, and speeds up claims, citing Goldman Sachs (2016).
- **Transparency and Trust:** Blockchain removes information asymmetry, which is a recurrent issue in Deloitte and Accenture literature.

Evaluation

Despite having a solid concept, the article has flaws

- **Lack of Empirical Support:** The practical persuasiveness of blockchain is diminished by the absence of real-world data or examples of pilot projects from Indian insurers implementing blockchain.
- **No Viewpoint of the Consumer:** **End-user implications**—such as user consent, accessibility, or trust in blockchain-based solutions—are not covered in the article.
- **Ignores Integration Barriers:** The paper makes the assumption that integration will go well without examining institutional and technical obstacles such as stakeholder reluctance or compatibility with legacy systems.

- **Limited Regulatory Perspective:**

Data protection under Indian IT law and the enforceability of smart contracts in India are not examined.

Conclusion

Blockchain smart contracts are effectively introduced in Mittal and Bhattacharjee's paper as a way to promote operational excellence in the insurance industry. It provides a clear use-case breakdown and simplifies difficult technical concepts for practical comprehension. It is still theoretical, though. Its scholarly worth would be increased by adding actual observations and legal/regulatory analyses. For additional study and testing in blockchain-led insurance innovation, the paper continues to provide a solid conceptual basis.

Article 2: 'Artificial Intelligence and Health Insurance' by Karan Nangla

Summary

Karan Nangla's article "Artificial Intelligence and Health Insurance," published in *The Journal of Insurance Institute of India* (Jan–Mar 2019), examines the ways in which AI is changing the health insurance market. It demonstrates AI's potential to close gaps in accessibility, accuracy, and efficiency within health insurance services and identifies its worth along the insurance value chain, from fraud detection to client engagement.

The author begins by outlining the importance of artificial intelligence (AI) in redefining operating models and how it could impact all of the

key insurance cycle processes, including marketing, underwriting, customer support, and claims processing. According to the article, key technologies supporting the shift include chatbots, machine learning (ML), natural language processing (NLP), and predictive analytics. It makes the case that AI can improve consumer happiness by facilitating dynamic premium pricing and real-time policy modifications.

The article then talking about how AI is being used in telemedicine, diagnostics, and wellness initiatives. AI is promoted as a tool for better claims adjudication, plan personalization, and health trend prediction. Additionally, it highlights how AI can avoid fraud and speed up decision-making by using data-driven insights.

Synthesis

Nangla's research aligns with more general scholarly debates over AI's revolutionary potential in the field of health insurance:

- **Innovation in Process:** The study emphasizes how AI redefines procedures, especially in automating claims, checking documents, and underwriting risk, which is consistent with McKinsey and PwC literature.
- **Proactive insurance and preventive health:** The paper backs the movement away from reactive insurance and toward preventive insurance. This change is supported by AI's application in wellness tracking and predictive diagnostics, which

leads to healthier populations and fewer claims

- **Improved Customer Experience:**

In line with research on digital customer interfaces from Infosys and IBM, the use of chatbots and natural language processing (NLP) enhances service delivery and reduces operating expenses.

Evaluation

- **Conceptual Generalization:** It mainly lists possible uses without supporting them with case studies or actual data. More specific confirmation would be provided by statistics on increased fraud detection rates or underwriting accuracy.
- **Minimal Ethical Analysis:** Data bias, privacy, and algorithmic responsibility are important concerns that AI in health insurance brings up but are not adequately addressed.
- **Limited Regulatory Insight:** The author mentions compliance in passing but skips over how regulatory organizations like IRDAI are adjusting to AI advancements.
- **Lack of Global Perspective:** The article's scope might be enhanced by comparing discussions around AI integration in health insurance across nations.

Conclusion

In conclusion An overview of how AI can revolutionize health insurance operations in India can be found in Nangla's article. Its ability to map the

possibilities of the technology across the insurance lifecycle is its strongest point. However, a more thorough examination of implementation difficulties, legal frameworks, and ethical considerations would enhance academic rigor. Notwithstanding these shortcomings, the paper contributes significantly by providing opportunities for additional study on AI-powered health insurance.

Article 3: 'Insurtech: The Uncharted Potential' by Tej Rajani

Summary

The Journal of Insurance Institute of India's January–March 2019 issue featured Tej Rajani's article "Insurtech: The Uncharted Potential," which examines how new technologies are upending and changing the insurance sector. The integration of wearables, telematics, blockchain, artificial intelligence (AI), and machine learning into the conventional insurance environment is the main topic of the essay. According to Rajani, insurtech firms are transforming the sector by tackling issues with customer experience, operational inefficiencies, and market penetration, particularly in underdeveloped markets like rural areas.

The article explains the disruptive potential of insurtech and positions it as a subset of fintech. An analysis of pertinent literature demonstrates how blockchain might improve operational transparency and efficiency.

The article gives a general overview of the insurance market

in India, outlining the issues of low persistency ratios, inadequate rural outreach, and the sharp rise in premiums and insurance coverage. Rajani highlights India's demographic advantages in utilizing Insurtech and presents the idea of "phygital"—a combination of digital and physical client interfaces.

Wearables for health monitoring, telematics for auto insurance, and smart contracts are some of the key technologies covered. The effectiveness of the distribution models—agents, brokers, bancassurance, and referral systems—is also examined and critiqued in the article. The article concludes by classifying Insurtech business models and highlighting obstacles like lack of startup differentiation, fraud risks, and regulatory concerns.

Synthesis

Rajani's paper makes a significant contribution to the current discussion regarding the insurance industry's digital transformation. A few thematic insights are revealed when combined with the larger body of literature:

- **Customer-Centric Innovation:** Insurtechs prioritize the customer journey, as the article reaffirms. Customized pricing, proactive engagement, and data-driven decision-making are made possible by the application of AI and telematics.
- **Operational Efficiency:** From underwriting to claims settlement, back-end operations are greatly improved by technologies like blockchain and machine

learning. These developments are consistent with research by Infosys and Braun & Schreiber, which highlights digital channels as facilitators of process change.

- **New Market Segments:**

The article's focus on rural and bottom-of-the-pyramid segments—which are frequently disregarded in Western literature—is one of its most incisive contributions. Rajani supports tailored rural policies and innovation in microinsurance.

- **Distribution and Ecosystems:**

The thorough examination of distribution methods supports international conversations regarding the changing digital ecosystems in the insurance industry. One creative tactic to close the digital divide is the hybrid "phygital" approach.

Evaluation

Although thorough, the article has some gaps that could have been filled to increase its scholarly rigor and practical relevance:

- **Absence of Empirical Support:**

A large portion of the study is still theoretical. The arguments would be strengthened by including case studies or empirical data, such as policy conversion rates or claims processing times before and after implementing Insurtech technologies.

- **Limited Regulation Discussion:**

Although fraud and the necessity of regulatory monitoring are mentioned in briefly in the essay, compliance frameworks—which

are crucial in a highly regulated sector like insurance—are not thoroughly covered.

- **Oversimplification of firms:** The article minimizes the operational and financial weaknesses of Insurtech firms while idealizing them. Scalability, data security, and financial limitations are issues that startups frequently face and should be taken into account.
- **Lack of Comparative Analysis:** Cross-national comparisons would enhance the article, especially when examining insurtech advancements in other developing nations like China or Brazil. This will put India's advancements in perspective on a worldwide scale.

Conclusion

The paper by Tej Rajani provides a comprehensive overview of the changing role of insurtech in India. It effectively conveys how digital technology have the ability to revolutionize established insurance processes. The article's comprehensive approach, which covers business models, technologies, and consumer engagement tactics, is its strongest point. However, empirical support and a more thorough examination of operational, budgetary, and regulatory limitations are required for the article to be deemed academically sound. Nonetheless, it continues to be a useful tool for professionals and academics who are curious about how technology and insurance are interacting in developing nations.

Article 4: Insurtech and the Uberization of Insurance—A Critical Appraisal of Venkatesh Ganapathy's Perspective

Summary

Venkatesh Ganapathy's article, which investigates how Insurtech is changing the conventional insurance industry, is subject to a critical analysis in this scholarly review. The review outlines the main points of the paper, synthesizes its topics, and provides a critical analysis that emphasizes operational viability, ethical considerations, empirical depth, and analogical accuracy. Though it would benefit from a more thorough analytical framework and consideration of wider regulatory and societal implications, the article is praiseworthy for capturing the dynamic interplay between technology and insurance.

Synthesis

Insurtech, which is powered by artificial intelligence (AI), robotics, the Internet of Things (IoT), and analytics, is not only upending but also facilitating the insurance sector, according to Ganapathy's main thesis. Instead of viewing insurtechs as existential dangers, the author promotes strategic alliances between them and traditional insurers. The article describes how new business models and leaner operational structures are changing underwriting, claims processing, and policy administration through case studies (such as Hippo and BIMA) and digital trends.

Given the low insurance penetration rate in India (3.49% in 2017), Ganapathy contends that digital platforms are a feasible means of expanding coverage and access, especially among underrepresented small enterprises and tech-savvy millennials.

- **Technology as an Enabler and Disruptor** The essay frequently discusses how technology plays two roles: it upends established insurance structures while also making efficiency, speed, and personalization possible. It has been demonstrated that technologies like artificial intelligence (AI) and telematics improve data-driven risk profiling while drastically cutting down on underwriting time and claims settlement.
- **Consumer-Centric Innovation** Ganapathy highlights the changing demands of digitally native customers, who expect transparent interactions, immediate gratification, and on-demand services. With their data-integrated personalization, mobile-first platforms, and streamlined applications, insurtechs are well-positioned to meet these needs.
- **Collaborative Ecosystems** Instead of advocating for a clear-cut decision between startups and legacy insurers, the essay supports strategic partnerships that bring together the agility and innovation of Insurtechs with the regulatory expertise and client trust of incumbents. Building

scalable, customer-focused, and sustainable solutions is said to require this collaborative methodology.

- **Inclusive Growth and Market Expansion** It has been determined that insurtechs have the ability to facilitate inclusive insurance, increasing coverage for rural and small business owners. Ganapathy contends that the access constraints that have traditionally restricted the uptake of insurance in India can be removed by new distribution channels, vernacular interfaces, and microinsurance products.

Evaluation

Advantages

- **Broad Scope:** The article is successful in providing a broad viewpoint that addresses both local (Indian) dynamics and global trends.
- **Timely Relevance:** The subject is relevant to the current changes in the financial services industry, particularly in the wake of COVID, where being digitally ready is now a must.
- **Real-World Caselets:** Readers may relate to real-world Insurtech implementations through case studies like Hippo and BIMA, which lend credibility.

Restrictions

- **Insufficient Empirical Detail** The lack of empirical validation is a major drawback. Although Ganapathy cites trend data and growth statistics (such as Accenture's survey), the majority

of the analysis is anecdotal. The inclusion of industry data (such as IRDAI reports and PwC/Swiss Re whitepapers) that measures the effect of insurtech on policy volumes, claims processing times, or cost reductions would enhance the article.

- **Using analogies to oversimplify** It's not really accurate to compare insurtech platforms to on-demand services like Ola or Swiggy. Because it involves risk transfer, actuarial modeling, and regulatory compliance, insurance is by its very nature more complicated. Although the analogy is instructive, it ignores the long-term contractual duties and trust elements that are essential to insurance.
- **Lack of Social and Ethical Conversation** Important ethical issues including algorithmic bias in underwriting, data privacy and monitoring, and broker/agent disintermediation and employment losses are not covered in the article. These issues cannot be ignored as AI and behavioral analytics are used more and more. Particularly when considering regulatory preparedness and societal impact, their exclusion represents a substantial gap.
- **Insufficient Framework for Implementation** The essay suggests strategic partnerships between startups and insurers, but it provides no integration road plan. Unresolved issues include common governance frameworks,

change management, legacy system compatibility, and data interoperability.

Conclusion

To sum up, Ganapathy's paper presents a positive and well-meaning assessment of Insurtech as a driving force behind insurance sector transformation. Its strategic framework of collaboration over disruption and current relevance are its strongest points. However, future studies must incorporate stakeholder analysis, operational norms, ethical protections, and quantitative effect evaluation to properly portray the complexity of the digital change in insurance.

The insurance industry in India is at a turning point. In addition to technological skill, responsible innovation, regulatory foresight, and customer trust will all be important factors in determining if Insurtech can live up to its potential.

Article 5 "Usage of Technology for Sustainable and Inclusive Growth in the Insurance Industry of India" authored by Dr. Pallavi and Prof. Manoj

Summary

The article by Dr. Pallavi and Prof. Manoj (2019), examines the revolutionary role that digital technologies play in fostering inclusive and sustainable growth in India's insurance sector. It was published in the Journal of Insurance Institute of India. The authors point out that low insurance penetration (3.4%) is a serious problem,

particularly in rural regions, and they suggest that wearable technology, telematics, mobile applications, and e-commerce are some of the developing technologies that could help. Key applications are divided into three categories by the study: client engagement, digital sales and distribution, and customized pricing techniques. In order to establish an effective, inclusive, and environmentally responsible insurance ecosystem, it also presents a forward-looking agenda that incorporates AI, IoT, blockchain, and drones. The study provides a conceptual framework for directing digital innovation aimed at improving insurance services' sustainability, efficiency, and accessibility.

Synthesis

The paper offers a multifaceted framework for the transformation of the insurance industry by combining ideas from development economics, marketing, and technology. It fits in nicely with the larger scholarly conversation on technology-enabled service innovation and digital inclusion. Digital distribution channels and mobile-first interaction are two examples of technical applications that align with the global shift toward data-driven, customer-centric insurance models.

Since 2019, developments in cloud computing, real-time decision systems, and AI-driven analytics have strengthened the article's arguments. Current best practices in rural insurance extension tactics are reflected in its emphasis on inclusion through virtual outreach techniques and public-private partnerships

(PPPs). Furthermore, the paper's support of sustainability aligns with the current trends in both developed and emerging markets toward responsible underwriting and green insurance products.

Evaluation

The article has certain shortcomings even though it offers a compelling and timely vision for Indian insurance's digital future:

Advantages:

- A concise description of the difficulties in increasing insurance penetration.
- The integration of digital technologies with an eye toward the future for cost effectiveness and customer engagement.
- The focus on sustainability and rural inclusion is pertinent and important from a social standpoint.

Weaknesses:

- The paper's assertions are not backed up by case-based analysis or empirical validation.
- It ignores cybersecurity, data privacy, and legal frameworks—all of which have grown in importance as digital ecosystems have developed.
- Although the study foresees the usage of blockchain, IoT, and AI, it does not go into detail on operational models or performance metrics that could be used to gauge success.

The paper would also benefit from updated references to cloud-edge infrastructure, explainable

AI frameworks that promote transparency in algorithmic decision-making, and self-service analytics platforms in light of recent advancements in business analytics and digital transformation.

Conclusion

The paper by Dr. Pallavi and Prof. Manoj is still quite pertinent given how the insurance industry is changing due to digitalization. Current practice and policy are still influenced by its fundamental beliefs about the use of technology to promote sustainable insurance products, inclusive growth, and increased consumer engagement. Rapid developments since 2019 necessitate a revised research perspective, one that takes into account the practical difficulties of digital transformation, data security issues, and the reality of AI deployment.

By providing empirical evaluations, investigating technology-policy alignment, and integrating user-centric design into digital insurance models, future research should expand on this conceptual foundation. The impact of such efforts will also be strengthened by a careful examination of technological obstacles, such as infrastructural shortages and digital illiteracy. All things considered, the paper continues to be a fundamental resource for comprehending how digital innovation might create a more effective and inclusive insurance sector in India.

Final Thoughts

A paradigm shift in the insurance sector is being sparked by the incorporation of cutting-edge

technologies like blockchain, artificial intelligence (AI), and insurtech platforms. According to the studied literature, these innovations are changing important operational areas like contract management, customer segmentation, underwriting, and claims processing. While Nangla

(2018) examines the revolutionary role of AI in enhancing the delivery of health insurance through virtual help and chronic care models, Mittal and Bhattacharjee (2018) highlight the usefulness of blockchain-based smart contracts in automating insurance operations.

By emphasizing the disruptive potential of emerging technologies in developing customer-centric and scalable business models, Rajani (2019) and Ganapathy (2019) expand on this conversation. Their observations on the use of blockchain, IoT, and AI in urban and commercial settings suggest that technical innovation and strategic expansion in the insurance industry are becoming convergent. In a similar vein, Pallavi and Manoj (2019) offer a development-focused viewpoint, emphasizing how telematics and digital distribution promote inclusive insurance in rural India.

The findings show several gaps in spite of these encouraging directions. Many don't offer implementation frameworks or empirical validation, especially when it comes to data governance, performance monitoring, and the function of explainable AI. Additionally, post-2020 developments like generative AI (GenAI), sophisticated machine learning models, and business blockchain platforms like Hyperledger have received little attention. Additionally, there is still a lack of attention paid to regulatory preparedness, infrastructure difficulties, and ethical issues, particularly in emerging and rural areas.

Overall, future research should strive to close the gap between theory and practice, even though the reviewed literature provides a strong conceptual and technological foundation. Empirical evaluations, technology synergy models (such as blockchain integration with AI), and inclusive frameworks that

Title & Author	Focus Area	Applications	Future Scope	Critique/ Observations
<i>Using Blockchain Smart Contracts to Drive Service Excellence in Insurance Sector</i> – Mittal & Bhattacharjee (2018)	Smart contracts for insurance process automation	Contract lifecycle, claims processing, KYC/AML automation	Research into regulatory frameworks, AI + Blockchain integration	Still relevant; lacks discussion on performance metrics or newer blockchain types (e.g., Hyperledger)
<i>Artificial Intelligence and Health Insurance</i> – Nangla (2018)	Role of AI in transforming health insurance	Claims management, chronic care models, virtual assistance	AI in predictive healthcare, dynamic policy pricing, cost reduction	Strong conceptual base but lacks real-world implementation data and doesn't cover explainable AI
<i>Insurtech: The Uncharted Potential</i> – Rajani (2019)	Role of emerging tech (AI, ML, Blockchain) in disrupting insurance	Smart contracts, wearables, customer segmentation	Insurtech in rural markets, regulatory support, partnerships	Good foresight; but fails to explore post-2020 AI/ML maturity models or GenAI
<i>Insurtech: Uberization Through Disruptive Models</i> – Ganapathy (2019)	Disruptive Insurtech models using AI, IoT, blockchain	Underwriting, customer service, commercial segment entry	Scaling to SME sector, blockchain-AI synergy	Practical insights; could benefit from updated case studies and innovation impact data
<i>Usage of Technology for Sustainable & Inclusive Growth</i> – Pallavi & Manoj (2019)	Using digital tools to expand insurance in rural India	Digital distribution, telematics, social media outreach	Eco-friendly product development, PPPs, AI for inclusion	Strong inclusion angle; lacks analysis of barriers like digital literacy or data privacy

Table 2:- Tabulated summary of all the reviewed papers

take into consideration the socioeconomic, legal, and infrastructure aspects of technology adoption in insurance should be given top priority. Policymakers, insurers, and technologists must be guided by such thorough research in order to create an insurance ecosystem that is resilient, equitable, and driven by innovation. **TJ**

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 - ii. Font: Times New Roman - Normal, black
 - iii. Line spacing: Double
 - iv. Font size: Title - 14, Sub-titles - 12, Body- 11 Normal, Diagrams/Tables/Charts - 11 or 10.
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5. **Keywords:** Immediately after the abstract, provide around 3-6 keywords or phrases.
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).

Heavy econometric article must be supported by NTS (non-technical summary). Contributor

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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 Journal publication:** Author(s).

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- **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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Appendix I

Declaration by Authors

I/we (Full Name of **the Author(s)**)

1)

2)

3)

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

(Title of the paper), which is our original work and not the intellectual property of anyone else.

I/we further declare that this paper has been submitted only to the Journal of the Insurance Institute of India and that it has not been previously published nor submitted for publication elsewhere.

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.

.....

(Signature Author I)

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.....

(Signature Author III)

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- **Post Graduate Diploma in Health Insurance (PGDHI)**

- The Post Graduate Diploma in Health Insurance (PGDHI) is a one year part time post graduate (two semesters) program.
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- The Course covers all aspects of Health Insurance including health economics, product development, rating, risk evaluation, human anatomy, diagnostics, underwriting, claims processing, importance of data analytics, fraud prevention and functioning of Third Party Administrators (TPAs).

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- The PGDIM Course consists of 8 Papers and a Research Project.
- The Course covers various topics relating to Insurance Marketing including Principles of Economics and Economic Environment, Risk Management and Underwriting of Life/ General/ Health Insurance lines, Understanding Buyer Behaviour, Marketing, Communication, Branding with specialization in Life Insurance or General Insurance.

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CC1 - Certificate course in Life Insurance Marketing

- **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
- **Exam pattern** - MCQ pattern

NOTES

[illegible]

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