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Dear reader,

The world is passing through tumultuous times. Suddenly, there are a lot of places across the globe where violence in the form of wars, civil wars, border skirmishes have erupted, threatening to disrupt Global, peace, and prosperity.

While such violence has not been uncommon earlier, what is different is the spread, the intensity and the way the current state of events is threatening to shake the world order. The nature of warfare has also undergone a change and is no longer about weapons, blasts and massed armies. Technology has evolved very fast and destruction happens without the enemies, facing each other.

Finance and economics as a tool has emerged as a major weapon. In this scenario, the role of insurance in shaping events has acquired significance.

Oil, gas, other cargo- all essential for the world economy, moving in ship's passing through a narrow strip of water for year's suddenly stopped. The exchange of missiles and drone's did cause panic. Along-with it came the realisation that insurance would not cover the huge risks and even if available it would be at highly increased rates. All activity nearly stopped.

Hopefully a resolution would be found to end the conflict and matter's should come to normal. Let us hope for the best.

Editorial Team



Managing Artificial Intelligence Risks in Insurance: A Comprehensive Enterprise Risk Management Framework for Indian Insurers



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Gautam Gupta is a senior risk, audit, and compliance professional with over 25 years of experience in banking and insurance in India, Vietnam, Thailand, and South Africa. He has led internal audit, non-financial risk, fraud risk, and financial crime engagements for global firms. He holds Certified Fraud Examiner (CFE) and Institute of Risk Management (IRM) ERM certifications.

Abstract

Indian insurers are increasingly deploying artificial intelligence across underwriting, claims management, fraud detection, and customer engagement. However, risk governance practices for these systems have not evolved at the same pace. This paper addresses this gap by examining how artificial intelligence risks can be systematically identified, structured, and managed within the insurance sector in India. The paper draws on the Massachusetts Institute of Technology Artificial Intelligence Risk Repository, which analyses 1,612 AI-related risks, and maps these risks against existing regulatory expectations issued by the Insurance Regulatory and Development Authority of India. Based on this analysis, the paper proposes an enterprise risk management framework structured around governance oversight, lifecycle-based model risk management, and integration with enterprise risk systems. The framework highlights key risk domains relevant to Indian

insurers and provides a structured approach for aligning artificial intelligence deployment with regulatory, operational, and ethical expectations.

Keywords

Artificial Intelligence Risk Management, AI Governance, Insurance Regulation, Enterprise Risk Management, IRDAI Compliance, Model Risk, Algorithmic Risk Management.

1. Introduction

Machine learning models are becoming common in Indian insurance operations. These AI systems now handle underwriting decisions, detect fraud, segment customers, calculate pricing, and process claims. The technology has advanced rapidly. Governance frameworks to manage the risks from these systems have not kept pace.

The Insurance Regulatory and Development Authority of India has been establishing expectations through various circulars. The Fraud Risk Management Framework, effective April 2026, mandates

advanced analytics and early warning system (Insurance Regulatory and Development Authority of India, 2025). Cybersecurity requirements and technology governance expectations have been articulated. However, most Indian insurers lack mature frameworks for managing AI risks across their operations. This creates regulatory exposure, operational vulnerabilities, and substantial reputational risks when AI systems make decisions affecting millions of policyholders.

The challenge has several dimensions. AI risks differ fundamentally from traditional insurance risks. An underwriting error by a human affects one policy. An error in an AI model can systematically affect thousands of policies before detection. There remains inconsistent understanding of what constitutes AI risks across companies, regulators, and the broader industry. The regulatory landscape continues to evolve, with clearer mandates emerging but comprehensive guidelines still under development.

This paper addresses these gaps through a practical framework for managing AI risks in insurance. The foundation is the MIT AI Risk Repository, which systematically analysed 1,612 AI risks (Slattery et al., 2024). The Repository uses two classification systems. The first examines whether risks originate from AI systems or humans, whether they are intentional or unintentional, and whether they occur before or after deployment. The second organizes risks into seven categories: discrimination and unfair treatment, privacy and security breaches, misinformation, malicious use, problems in how humans interact with AI systems, broader societal and environmental harms, and technical failures or limitations of AI systems themselves.

This paper translates these academic classifications into governance structures and controls applicable to the Indian insurance market.

2. Building an Enterprise AI Risk Framework

Effective AI risk management in insurance requires three fundamental components.

First, AI risk governance must operate at the board level. This oversight cannot be delegated solely to IT departments or innovation teams. The Risk Management Committee needs explicit oversight of AI risks, similar to its oversight of financial and operational risks. AI systems create new types of failures that traditional governance structures were not designed to capture.

Second, AI risk management must span the entire model lifecycle.

This begins when someone first proposes building an AI system. It continues through data collection, model building, testing, validation, deployment, and ongoing monitoring. It ends only when the system is retired. The conventional approach of addressing risk primarily after deployment misses most vulnerabilities.

Third, AI risk management must integrate with enterprise risk management systems. When an AI model fails, it creates multiple types of risk simultaneously. A pricing model that systematically underprices certain risks creates operational losses. If that model also discriminates against protected groups, it creates compliance and reputational risks. These cannot be managed separately.

Pillar One: Governance Structure

Board-level governance structures are essential. The Risk Management Committee should establish an AI Risk Oversight Subcommittee. This subcommittee should include the Chief Risk Officer, Chief Audit Officer, Chief Compliance Officer, Chief Information Officer, and relevant business heads. The subcommittee develops policies requiring board approval before deploying AI in customer-facing decisions such as underwriting, claims, or pricing.

Why board-level oversight?

AI systems in insurance make consequential decisions at scale. A claims processing AI might review 10,000 claims per month. If the system contains a flaw, that flaw affects all 10,000 decisions. Board-level oversight ensures appropriate scrutiny before such systems go live.

The policy framework must specify several requirements. What validation must occur before deployment? What ongoing monitoring will detect problems? Who has authority to modify or shut down a system if issues emerge?

While IRDAI has not issued consolidated AI guidance, expectations are building across multiple circulars. An enterprise-level AI Risk Register is needed. This register documents each deployed AI system, describing what decisions it makes, what data it uses, its validation status, and how it is monitored. The Risk Management Committee should review this register quarterly.

Clear accountability is essential. For each AI system, specific individuals must be responsible for governance oversight, technical validation, ongoing monitoring, and decision-making authority.

Pillar Two: Lifecycle-Based Model Risk Management

Comprehensive model risk management requires attention to each phase of the AI lifecycle.

Data Governance and Quality

Data quality determines AI system reliability. Consider an underwriting model trained primarily on urban customer data. When applied to rural customers, it may perform poorly because the training data did not represent that population. Organizations need documented frameworks establishing who owns data, how its origin is tracked, what quality standards apply, and how data is validated.

For training data, assessment must determine whether datasets adequately represent all populations subject to AI-driven decisions. Insurance data presents particular challenges. Historical discrimination in underwriting has produced datasets encoding unfair outcomes. For example, if an insurer historically charged higher premiums in certain neighbourhoods due to bias rather than actual risk, an AI model trained on that data will perpetuate those discriminatory patterns.

Model Development and Validation

Prior to deployment, AI models require comprehensive validation testing. This testing serves multiple purposes.

Performance testing across different population segments identifies whether the model works equally well for all groups. For example, does a claims fraud detection model have similar accuracy for claims from different geographic regions? Significant accuracy differences may indicate problems.

Fairness testing quantifies whether models systematically disadvantage specific groups. Multiple metrics exist for measuring fairness, and organizations should test against several. A model might be fair by one definition but unfair by another.

Stress testing determines whether models maintain performance when conditions change. What happens to an underwriting model trained during stable economic conditions when applied during a recession? Models that perform well under normal conditions may fail under stress.

Explainability testing ensures model decision logic can be articulated. When a model declines an insurance application, can the insurer explain why? Regulatory expectations and customer service requirements demand explainability.

Adversarial testing identifies whether bad actors can manipulate model inputs to produce desired outputs. For example, can someone structure a fraudulent claim in ways that evade fraud detection systems?

Independent Validation

Independent validation by personnel not involved in model development represents a critical control. The team that builds a model naturally develops attachment to it. Independent reviewers assess whether models satisfy performance and fairness standards, whether documentation is complete and accurate, and whether all deployment conditions have been met.

Many organizations inadequately implement this control. Development teams sometimes validate their own work, which defeats the purpose.

Ongoing Monitoring and Drift Detection

AI models can degrade over time. This phenomenon, called model drift, occurs when the patterns in real-world data diverge from patterns in training data. Consider a fraud detection model trained on historical fraud patterns. As fraudsters adapt their techniques, the model becomes less effective at detecting new fraud types.

Post-deployment monitoring must detect performance degradation,

accuracy decline, and fairness drift. Statistical techniques can establish alert thresholds. When model performance falls below these thresholds, investigation and remediation protocols activate.

Fairness monitoring is particularly important. A model meeting fairness standard in testing can produce discriminatory outcomes in production. This occurs when real-world data patterns differ from test data patterns.

Lifecycle Management

Organizations need procedures for model versioning. If a new model version creates problems, the ability to quickly revert to the previous version limits damage. Criteria for model retirement must be established. Models should be retired when they no longer meet performance standards or when business requirements change such that the model is no longer appropriate.

Pillar Three: Integration with Enterprise Risk Management

AI risks cannot be managed as isolated technology concerns. Consider a claims assessment AI that begins approving fraudulent claims at elevated rates. This creates several risks simultaneously. There is operational risk from financial losses. There is strategic risk if competitors gain advantage. There is reputational risk if the issue becomes public. There may be regulatory risk if the failures violate compliance obligations.

The Chief Risk Officer should establish AI risk metrics integrated

into enterprise risk dashboards. This integration ensures AI risks receive appropriate attention alongside other risk categories.

Key indicators include the percentage of customer-facing decisions made by AI systems. This metric provides perspective on AI system footprint. The percentage of deployed models meeting validation standards indicates governance maturity. The number of fairness threshold violations detected through monitoring reveals whether discrimination issues are emerging. Model remediation time measures how quickly the organization responds to performance or fairness degradation. Regulatory compliance incidents related to AI systems track regulatory exposure.

3. Domain-Specific Risk Management

The MIT AI Risk Repository identifies several risk domains with particular relevance to insurance operations (Slattery et al., 2024).

Discrimination and Unfair Treatment

These risks materialize when AI systems produce disparate outcomes across protected characteristics such as gender, religion, caste, or geographic location. Consider an underwriting model that systematically denies coverage to applicants from specific districts. If those districts correlate with protected characteristics, the model may produce indirect discrimination even if it never explicitly considers those characteristics.

Pricing models can amplify historical discrimination. Suppose historical data reflects periods when certain

groups were charged higher premiums due to bias rather than actuarial risk. An AI model trained on that data learns to price higher for those groups, perpetuating past discrimination.

IRDAI (Insurance Products) Regulations, 2024, which mandate that premium rates be fair and not unfairly discriminatory. AI systems encoding such discrimination violate these regulations. The fact that discrimination is algorithmic rather than deliberate provides no defense.

Privacy and Security

AI models trained on sensitive personal data can inadvertently memorize and leak that data. Research has demonstrated that language models can sometimes be prompted to reveal training data, including sensitive information. In insurance, models trained on health data, financial information, or claims history face similar risks.

AI systems themselves become attractive targets for adversaries. Consider a fraud detection system. If fraudsters can determine how the system makes decisions, they can structure fraudulent claims to evade detection. Adversarial machine learning research has demonstrated numerous techniques for manipulating AI systems (Weidinger et al., 2021).

Misinformation and Malicious Use

These risks emerge when AI-generated content influences customer decisions without appropriate oversight. Chatbots providing insurance advice may generate misleading responses. AI-generated marketing materials might

misrepresent policy terms. Automated communication systems could create false impressions of coverage.

As generative AI becomes more capable, these risks intensify. A customer service chatbot trained on policy documents might confidently provide incorrect information. Unlike human service representatives who recognize uncertainty, AI systems can appear certain even when wrong.

AI System Safety and Reliability

AI models can fail under adverse conditions. An underwriting model deployed during stable economic conditions may encounter very different data patterns during economic crises. If the crisis conditions were not represented in training data, the model may produce unreliable decisions.

Claims assessment models face similar challenges. Consider a model trained to assess vehicle damage claims. It may perform well on common damage types but fail when presented with unusual damage not represented in training data (Hendrycks & Mazeika, 2023). The model may confidently provide assessments for situations it cannot actually evaluate.

4. Implementation Framework

Implementation of comprehensive AI risk management should proceed in phases.

Phase 1: Months 1-6

The initial phase establishes foundational elements. Organizations should create an AI Risk Register identifying all deployed AI systems.

Many organizations lack complete inventories of where AI is being used. Without this inventory, comprehensive risk management is impossible.

A governance maturity assessment establishes baseline capabilities. Where does the organization currently stand on AI oversight? What governance structures exist? What validation processes are in place? This assessment identifies gaps requiring remediation.

Development of board-level AI risk policy follows. This policy establishes governance structures, decision authorities, and basic requirements for AI system deployment. The policy requires board approval to signal its importance.

Assessment of current validation practices identifies specific gaps. Are models being independently validated? Are fairness tests being conducted? Is documentation adequate?

Phase 2: Months 6-12

This phase implements core controls. Organizations should establish independent model validation procedures staffed by personnel separate from development teams. Data governance frameworks are implemented, establishing clear standards for data quality, lineage tracking, and bias detection.

Performance monitoring systems are deployed for existing models. This monitoring may reveal that some existing models fail to meet appropriate standards. Remediation of non-compliant models begins. In some cases, remediation means

improving models to meet standards. In other cases, it means retiring models that cannot be remediated.

Phase 3: Months 12-24

Integration with enterprise risk management occurs during this phase. AI risk indicators are incorporated into enterprise risk dashboards visible to senior management. This integration ensures AI risks receive ongoing attention.

Fairness monitoring is implemented for customer-facing models. Unlike performance monitoring, which tracks whether models make accurate predictions, fairness monitoring tracks whether models treat different groups equitably.

Documented procedures for model development, validation, and deployment are established. These procedures ensure consistent practices across the organization.

Regulatory gap assessments evaluate alignment with IRDAI expectations. As regulatory guidance evolves, organizations need systematic processes for identifying and closing gaps.

Phase 4: Months 24 and Beyond

Organizations should establish AI risk centers of excellence. These centers provide governance guidance, maintain standards, and share best practices across the enterprise. They serve as resources for business units deploying AI systems.

Advanced fairness testing methodologies are implemented. Early-stage fairness testing often uses relatively simple metrics. As

organizational maturity increases, more sophisticated testing approaches become appropriate.

Capabilities for addressing emerging AI risks are developed. Generative AI, multi-agent systems, and other emerging technologies present new risk profiles requiring new management approaches.

Ongoing alignment with evolving regulatory requirements is maintained. As IRDAI issues new guidance, organizations with mature governance frameworks can adapt more readily.

5. Regulatory Landscape

IRDAI has established regulatory expectations for AI governance distributed across various circulars rather than through consolidated guidance.

The Fraud Risk Management Framework effective April 2026 mandates advanced analytics and fraud detection capabilities while requiring governance oversight of these systems (Insurance Regulatory and Development Authority of India, 2025). This circular represents one of the clearest regulatory mandates for AI deployment in Indian insurance. It explicitly requires insurers to deploy AI-based fraud detection while simultaneously requiring appropriate governance and oversight.

Cybersecurity guidelines and master circulars on information and cyber security establish data protection and system security controls. These controls apply directly to AI systems handling sensitive customer data. The requirement that insurers maintain data security and privacy protections

extends naturally to data used for AI training and inference.

Various technology governance circulars create expectations that AI systems fall under governance structures similar to other technology deployments. These circulars imply board-approved policies for technology deployment and risk management, which encompass AI systems.

The Sabka Bima Sabki Raksha Bill, 2025 establishes a Policyholders' Education and Protection Fund for consumer protection and education, while strengthening IRDAI's enforcement authority through enhanced disgorgement and penalty powers that could be applied to violations arising from AI-driven decisions. This creates financial incentives for robust governance. If an AI system harms policyholders, the insurer may face financial consequences beyond immediate operational losses.

These amendments also provide IRDAI with enhanced enforcement authority, including disgorgement powers. These powers can be applied to companies deploying non-compliant AI systems. Disgorgement allows regulators to require companies to return gains obtained through non-compliant practices.

Current regulatory expectations are building across multiple instruments. The regulatory direction indicates that insurers need robust governance frameworks for AI systems.

Organizations developing these capabilities proactively position themselves ahead of likely future requirements.

6. Emerging Challenges

Indian insurers face AI risk challenges extending beyond traditional model governance.

Generative AI applications in customer service and claims assessment introduce new risks. Unlike traditional AI models that classify inputs or make predictions, generative AI creates new content. A traditional customer service AI might route inquiries to appropriate departments. A generative AI might attempt to answer customer questions directly. This creates risks of misinformation if the system generates incorrect information. It creates risks of inconsistency if the system generates different responses to similar questions.

The National Institute of Standards and Technology AI Risk Management Framework addresses some emerging concerns (National Institute of Standards and Technology, 2024). However, the pace of technological change means that frameworks require continuous updating.

AI agents capable of sequential decision-making and inter-system communication create multi-agent risks. Traditional AI models receive inputs and produce outputs. AI agents can take actions, observe results, and take additional actions based on those results. When multiple AI agents interact, their collective behaviour may diverge from what designers intended for individual systems (Critch & Russell, 2023).

Integration of AI systems from multiple third-party vendors creates new risk categories. When insurers build AI systems internally, they

control development and validation processes. When they license AI systems from vendors, they depend on vendor validation. Vendor risk management frameworks must evolve to address AI-specific concerns. What validation has the vendor performed? What ongoing monitoring does the vendor conduct? What happens if the vendor discontinues the system?

Climate risk underwriting represents a particularly critical frontier. Climate change creates novel risk patterns not well-represented in historical data. Underwriting models trained on historical loss data may fail to capture emerging climate risks. Extreme weather events become more frequent and severe. Geographic areas previously considered low risk for certain perils may become high-risk.

This challenge requires both technical and governance responses. Technically, models must incorporate forward-looking climate projections rather than relying solely on historical patterns. From a governance perspective, transparent and auditable decision logic becomes essential. IRDAI has established Environmental, Social, and Governance expectations. Stakeholders increasingly expect insurers to manage climate risks responsibly. AI systems making climate-related underwriting decisions must satisfy both regulatory requirements and stakeholder expectations for transparency.

7. Conclusion

Managing AI risks in insurance requires governance frameworks spanning organizational structures,

model risk management processes, and enterprise risk integration. This paper has presented a comprehensive framework providing implementation guidance aligned with IRDAI's evolving regulatory expectations while drawing on systematic research from the AI risk community.

The framework establishes three core pillars. First, board-level governance ensures appropriate oversight of AI systems making consequential decisions. Second, lifecycle-based model risk management addresses vulnerabilities from initial development through eventual retirement. Third, integration with enterprise risk management ensures AI risks receive attention alongside other risk categories.

Implementation proceeds through phases over 24 months and beyond. Initial phases establish foundational elements such as AI risk registers, governance policies, and maturity assessments. Subsequent phases implement core controls including

independent validation, performance monitoring, and fairness testing. Later phases integrate AI risk management into enterprise systems and develop capabilities for emerging risks.

The framework recognizes that AI risks differ fundamentally from traditional risk categories. AI systems can fail at scale, affecting thousands of decisions simultaneously. They can encode and amplify historical biases present in training data. They can degrade over time as real-world patterns diverge from training data patterns. They can be manipulated by adversaries. These characteristics require risk management approaches specifically designed for AI systems.

IRDAI will likely move toward more consolidated and explicit guidelines over time. Organizations with mature governance frameworks will adapt more readily to such requirements. The regulatory direction remains clear even as specific requirements continue crystallizing. The current environment creates an opportunity

for forward-looking insurers to establish competitive advantage through robust AI risk management.

Insurers implementing comprehensive frameworks reduce regulatory exposure by proactively addressing emerging requirements. They build stakeholder trust by demonstrating responsible AI deployment. They establish operational resilience by detecting and remediating AI system issues before they create significant harm. Most fundamentally, they ensure that AI deployment serves its intended purpose: improving insurance operations while protecting policyholder interests.

The development of AI risk management capabilities represents a strategic priority rather than a deferred technical concern. As AI systems become more deeply embedded in insurance operations, the organizations that manage AI risks effectively will be those that thrive in an increasingly complex regulatory and technological environment. **TD**

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Risk-Based Capital Framework by IRDAI: Strengthening Solvency and Financial Stability in Indian Insurance



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Abstract

The Insurance Regulatory and Development Authority of India (IRDAI) has embarked on a transformative journey by implementing a Risk-Based Capital (RBC) framework to replace the traditional factor-based solvency regime. This article examines the evolution, structure, and implications of the RBC framework for Indian insurers. The study analyses how the RBC approach aligns capital requirements with actual risk exposures, enhances financial stability, and positions Indian insurance regulation in line with international best practices. Through an examination of the framework's components, implementation challenges, and strategic implications, this paper demonstrates that RBC adoption marks a paradigm shift toward more sophisticated risk management and solvency assessment in the Indian insurance industry.

Keywords

Risk-Based Capital, IRDAI, Solvency Framework, Insurance Regulation, Risk Management, Financial Stability

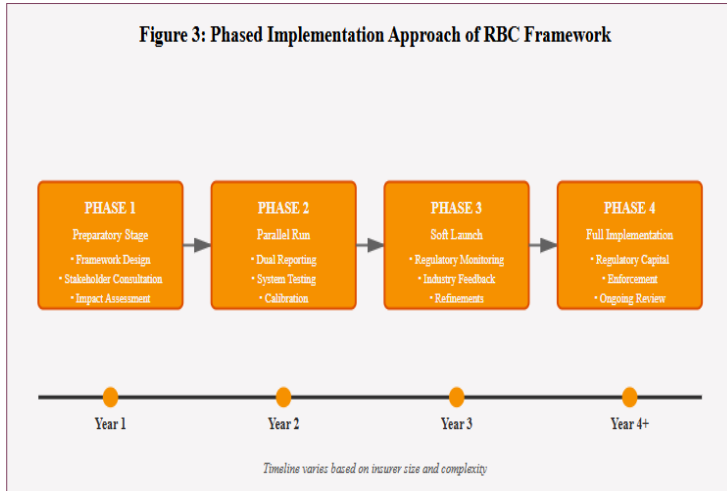
Introduction

The insurance industry serves as a critical pillar of financial stability, providing protection against various risks while managing substantial pools of capital. Ensuring that insurers maintain adequate capital to meet their obligations has been a fundamental regulatory objective worldwide. In India, the Insurance Regulatory and Development Authority of India (IRDAI) has traditionally employed a factor-based solvency regime, where capital requirements were determined through predetermined ratios applied uniformly across insurers. However, this approach had inherent limitations in capturing the diverse and complex risk profiles of modern insurance entities.

Recognizing these limitations and aligning with global regulatory evolution, IRDAI introduced the Risk-Based Capital framework, representing a significant leap forward in insurance supervision. The RBC framework fundamentally transforms how capital adequacy is assessed by linking capital requirements directly to the specific risks undertaken by each insurer. This approach acknowledges that different insurers face different risk exposures based on their business models, asset portfolios, underwriting strategies, and operational characteristics.

The transition to RBC reflects IRDAI's commitment to strengthening the financial health of the insurance sector while promoting sustainable growth. By adopting principles similar to international frameworks such as Solvency II in Europe and the Risk-Based Capital system in the United States, India demonstrates its integration into the global regulatory landscape.

Figure 3: Phased Implementation Approach of RBC Framework



Evolution of Solvency Regulation in India

The journey toward risk-based supervision in India has been gradual but deliberate. The traditional solvency margin requirements, introduced in the early 2000s, served the industry well during its formative years post-liberalization. Under this system, life insurers were required to maintain Available Solvency Margin (ASM) of at least 150 percent of the Required Solvency Margin (RSM), while non-life insurers needed to maintain similar ratios based on premium income and claims incurred.

However, as the industry matured and became more complex, regulators globally recognized that uniform factor-based approaches failed to differentiate between well-managed insurers with robust risk controls and those with weaker risk management practices. The 2008 global financial crisis further highlighted the need for more sophisticated regulatory frameworks that could identify and

address emerging risks before they threatened solvency.

IRDAI began exploring risk-based approaches in the mid-2010s, conducting extensive consultations with industry stakeholders, studying international models, and assessing the preparedness of Indian insurers for such a transition. The process involved multiple discussion papers, pilot studies, and calibration exercises to ensure that the framework would be appropriate for Indian conditions while meeting international standards.

Core Components of the RBC Framework

The RBC framework represents a comprehensive approach to solvency assessment, built on several interconnected pillars that together provide a holistic view of insurer financial health.

The first pillar focuses on quantitative capital requirements, establishing minimum capital levels that insurers must maintain based on their risk exposures. Unlike the previous regime, capital requirements under RBC are calculated by assessing various risk categories including underwriting risk, market risk, credit risk, operational risk, and asset-liability mismatch risk. Each risk category is evaluated using standardized formulas or, for more sophisticated insurers, internal models subject to regulatory approval. The framework employs a modular approach where risks are first calculated individually and then aggregated using correlation matrices that recognize diversification benefits.

Figure 2: Key Risk Categories under RBC Framework

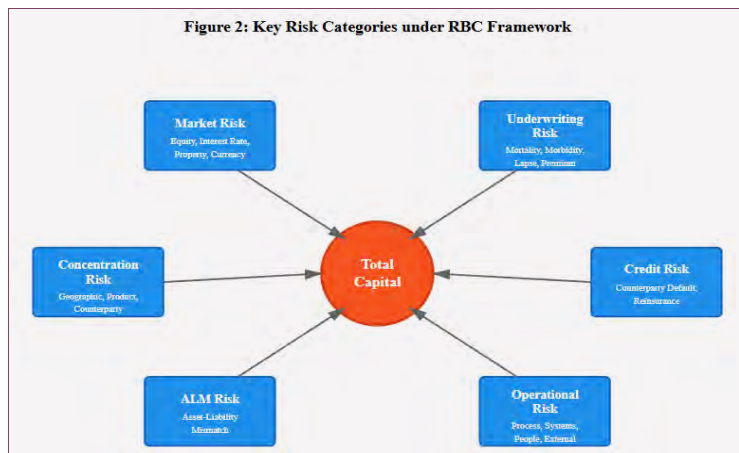
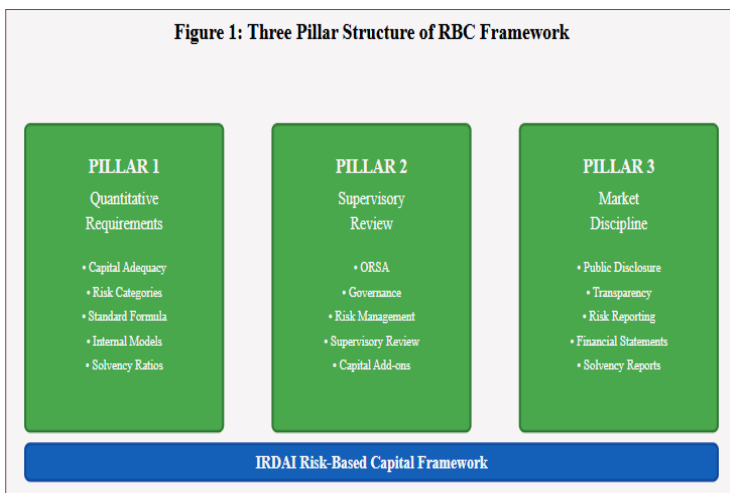


Figure 1: Three Pillar Structure of RBC Framework



Market risk calculations consider exposure to equity price movements, interest rate fluctuations, property value changes, currency fluctuations, and spread risk. Underwriting risk assessment differs between life and non-life businesses, with life insurers evaluated on mortality, longevity, morbidity, lapse, and expense risks, while non-life insurers focus on premium and reserve risk. Credit risk encompasses counterparty default risk across various exposures including reinsurance recoverable, deposits with cedants, and other receivables. Operational risk recognition acknowledges that losses can arise from inadequate internal processes, systems, human errors, or external events.

The second pillar emphasizes supervisory review and governance, requiring insurers to conduct their Own Risk and Solvency Assessment (ORSA). Through ORSA, insurers must evaluate their overall solvency needs, considering both quantitative

and qualitative factors, and demonstrate that they maintain capital commensurate with their risk profile. This process encourages boards and senior management to take ownership of risk management and capital planning. IRDAI can impose additional capital requirements on insurers whose risk management practices are deemed inadequate or whose risks are not fully captured by the standard formula.

The third pillar focuses on market discipline through enhanced disclosure requirements. Insurers must publish detailed information about their risk exposures, capital adequacy, risk management practices, and governance structures. This transparency enables stakeholders including policyholders, investors, and market analysts to make informed assessments about insurer financial strength.

Benefits and Implications for the Industry

The implementation of RBC brings numerous advantages for insurers, policyholders, and the broader financial system. For insurers, the framework provides incentives for better risk management, as those with robust controls and diversified portfolios can benefit from lower capital requirements. This risk-sensitive approach promotes efficiency in capital allocation, enabling insurers to optimize their business strategies and potentially improve returns on equity.

Policyholders gain enhanced protection through a more forward-looking supervisory approach that identifies potential vulnerabilities earlier. The framework's emphasis on comprehensive risk assessment reduces the likelihood of insurer failures and ensures that companies maintain adequate resources to meet their obligations even under stressed scenarios.

From a systemic perspective, RBC contributes to financial stability by ensuring that the insurance sector remains resilient to shocks. The framework's alignment with international standards facilitates cross-border operations and foreign investment, as global insurers find familiarity with risk-based approaches. This harmonization also supports Indian insurers' international expansion ambitions by demonstrating compliance with

globally recognized regulatory principles.

The emphasis on enterprise risk management and ORSA encourages insurers to develop sophisticated analytical capabilities and risk management infrastructure. This professionalization of risk management practices strengthens organizational resilience and decision-making quality.

Table 1: Comparison of Factor-Based vs Risk-Based Capital Approach

Aspect	Factor-Based Solvency	Risk-Based Capital (RBC)
Capital Calculation	Uniform factors applied to all insurers based on premium and claims	Risk-sensitive calculations based on individual risk profiles
Risk Differentiation	Limited - treats all insurers similarly	High - recognizes diverse risk exposures and management quality
Risk Categories	Basic categorization (premium, claims)	Comprehensive (market, credit, underwriting, operational, ALM)
Forward-Looking	Primarily historical and backward-looking	Incorporates stress scenarios and forward projections
Risk Management Incentive	Limited incentives for better risk management	Strong incentives - lower capital for better risk controls
Complexity	Simple calculations, easy to implement	Complex modeling, significant technical requirements
Data Requirements	Basic financial data	Granular, detailed data across all risk categories
Supervisory Approach	Rules-based compliance	Principles-based with supervisory judgment (ORSA)
International Alignment	Limited alignment with global standards	Aligned with Solvency II, US RBC, and IAIS principles
Capital Efficiency	May lead to over or under-capitalization	More efficient capital allocation matching actual risks

Implementation Challenges and Considerations

Despite its benefits, RBC implementation presents significant challenges for insurers and regulators alike. The framework demands substantial investments in systems, data infrastructure, actuarial capabilities, and human resources. Smaller insurers may face disproportionate burden in building these capabilities, potentially leading to competitive disadvantages. IRDAI has recognized this

concern and adopted a phased implementation approach with differential timelines and requirements based on insurer size and complexity.

Data quality and availability remain critical concerns. Accurate risk assessment requires granular, reliable data across all risk categories, spanning multiple years to support robust statistical analysis. Many insurers face gaps in historical data, particularly for operational risk and certain emerging risk categories. Addressing these gaps require significant effort in data governance, collection, and validation processes.

The calibration of risk factors and correlation assumptions presents technical challenges. IRDAI must ensure that parameters are appropriate for Indian market conditions, reflecting local risk characteristics rather than blindly adopting international standards. This requires extensive industry data analysis, stress testing, and regular recalibration as market dynamics evolve.

Cultural change within organizations represents perhaps the most fundamental challenge. Moving from compliance-focused approaches to risk-based thinking requires transformation in mindsets, processes, and organizational structures. Senior management and boards must genuinely embrace risk-based decision-making rather than treating RBC as merely a regulatory compliance exercise.

Strategic Responses for Insurers

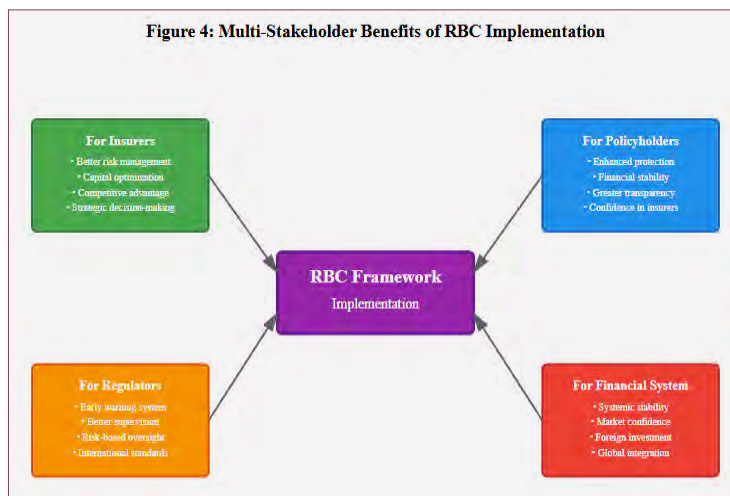
Insurers must adopt strategic approaches to navigate the RBC transition successfully. Investment in technology infrastructure forms the foundation, with many insurers implementing specialized actuarial and risk management software capable of handling complex RBC calculations and scenario analyses. Integration of risk management systems with core business systems enables real-time risk monitoring and more dynamic capital management.

Talent development represents another critical priority. Insurers need to attract, retain, and develop professionals with expertise in actuarial science, risk management, data analytics, and regulatory compliance. Many organizations are establishing centres of excellence for RBC, bringing together cross-functional teams to drive implementation and ongoing compliance.

Business model evaluation becomes essential under RBC, as certain activities may become less attractive when capital requirements accurately reflect underlying risks. Insurers are reassessing their product mix, investment strategies, and reinsurance programs to optimize risk-adjusted returns. Those with high concentrations in capital-intensive segments may consider diversification or risk transfer strategies.

Enhanced governance and risk culture must permeate organizations. Boards and senior management require regular training on RBC principles and implications. Risk committees need to evolve from periodic review bodies to active participants in strategic decision-making, with risk considerations embedded in all major business decisions.

Figure 4: Multi-Stakeholder Benefits of RBC Implementation



The Path Forward

The RBC framework represents the future of insurance regulation in India, with IRDAI continuing to refine and enhance the system based on implementation experience and evolving international standards. Future developments may include greater use of internal models for sophisticated insurers, incorporation of climate risk and emerging risk categories, and further harmonization with global frameworks.

Success will depend on continued collaboration between regulators and industry, with open dialogue on implementation challenges, appropriate calibration of parameters, and balanced approaches that protect policyholders while enabling business growth. IRDAI's consultative

approach throughout the development process bodes well for this ongoing partnership.

Insurers that embrace RBC as an opportunity rather than a burden will gain competitive advantages through superior risk management, efficient capital utilization, and enhanced stakeholder confidence. Those that view it merely as compliance will likely struggle with both implementation and the strategic implications.

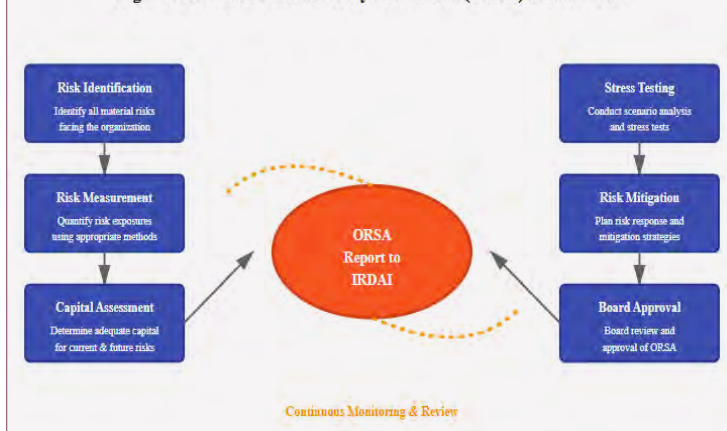
Conclusion

The adoption of Risk-Based Capital framework by IRDAI marks a watershed moment in Indian insurance regulation, fundamentally transforming how solvency is assessed and supervised. By linking

capital requirements to actual risk exposures, the framework promotes more sophisticated risk management, enhances financial stability, and aligns India with international regulatory best practices.

While implementation presents significant challenges requiring investments in systems, capabilities, and cultural change, the long-term benefits for insurers, policyholders, and the financial system are substantial. The framework's emphasis on risk-sensitive capital requirements, comprehensive risk assessment, robust governance, and market transparency creates a stronger foundation for sustainable industry growth.

Figure 5: Own Risk and Solvency Assessment (ORSA) Process Flow



As the industry progresses through the RBC transition, success will depend on commitment from both regulators and insurers to making the framework work effectively. IRDAI's phased approach and consultative process demonstrate thoughtful recognition of industry realities, while insurers' investments in building RBC capabilities reflect understanding of its strategic importance.

The RBC framework is not merely a regulatory requirement but a catalyst for transforming the Indian insurance industry into a more resilient, sophisticated, and globally integrated sector. Embracing this transformation will position Indian insurers to navigate future challenges, capitalize on growth opportunities, and fulfil their critical role in India's economic development with enhanced financial strength and stakeholder confidence.



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Use of Diagnostic Tools and Data Logs in Motor Claim Assessment: Strengthening Survey Conclusions through Objective Vehicle Data



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Abstract

The integration of vehicle diagnostic data (DTCs, freeze-frame snapshots, ECU logs) into motor claims adjudication offers objective insight into pre- and post-accident conditions. This study examines how on-board diagnostic (OBD) outputs and control-unit logs can strengthen surveyor conclusions, improve fault determination, and support fair claim outcomes. By reviewing the evolution of OBD and event data recording technologies, we show that modern vehicles generate rich digital evidence in addition to traditional physical damage. We describe the diagnostic information available (code definitions, freeze-frame parameters, status flags) and how it complements visual inspection. Practical examples illustrate use in accident reconstruction and fraud detection. Limitations (data availability, privacy) and guidelines for professional use

are discussed. Emphasis is placed on leveraging these data sources to improve accuracy and defensibility of insurance appraisals [1][2].

Keywords

Vehicle Diagnostics, Data Logging, OBD-II, ECU Data, Insurance Claims, ADAS, Accident Forensics, Fraud Detection.

Introduction

Electronic control units (ECUs) and a multitude of sensors are installed in modern passenger cars to continuously monitor system conditions. On-board Diagnostics II (OBD-II) interfaces grant access to real-time engine parameters and trouble codes[2]. Over the past two decades this capability has evolved from emission compliance checks into a broad diagnostic platform. For vehicle surveys and insurance claims, these data logs constitute objective

evidence of pre-accident conditions. Recent work on automotive digital forensics demonstrates that accident investigators can extract critical information via the OBD-II port and other interfaces[3][4]. In effect, the vehicle itself becomes a sensor platform, recording speed, brake use, sensor errors and even driver inputs around the time of a crash[3][5]. Surveyors who incorporate this objective data can substantiate or refute claim scenarios more rigorously. This paper reviews relevant diagnostics tools (DTCs, freeze-frame data, ECU logs) and illustrates their application in claim assessment and fraud mitigation.

Evolution of Vehicle Diagnostics and Telemetry

The OBD-II standard (introduced in mid-1990s) created a uniform interface for retrieving engine and emissions data[2]. Initially mandated

for environmental monitoring, its scope has since broadened. Sensor networks now track engine load, RPM, vehicle speed, throttle position, coolant temperature and more[2]. These streams are sampled in real time and can trigger Diagnostic Trouble Codes (DTCs) when faults occur. Meanwhile, insurer-driven telematics (OBD-based plug-in units or factory-installed modems) have become widespread for monitoring driving behavior and risk[6][5]. Telematics data (mileage, acceleration, location, harsh braking) are used to refine underwriting and can also inform claims investigations. Altogether, vehicle systems have grown from simple emission monitors into complex telemetry networks. Recent research highlights that modern “software-defined” vehicles record expansive data sets (often uploading to manufacturer servers) beyond what earlier Event Data Recorders (EDRs) captured[7][8]. In summary, diagnostics has evolved from periodic visual inspection to include continuous automated logging, offering new opportunities for evidence gathering in insurance surveys.

Diagnostic Tools and Data Available to Surveyors

Surveyors have several standardized data sources to probe a vehicle’s status. Common tools include OBD-II scan tools (handheld or PC-connected) and more advanced OEM-specific interfaces. Key data types are:

Diagnostic Trouble Codes (DTCs): When a fault is detected, the ECU

stores a DTC (a standardized alphanumeric code) identifying the issue (e.g. engine misfire, ABS fault). These codes are accessible via the OBD-II port. A reading of DTCs reveals historical and current system errors[2]. For example, a code for engine power loss can suggest mechanical failure, while stored coolant-overheat codes might indicate collision-related radiator damage. DTCs are thus a first-pass filter on system health. While not all codes indicate crash cause, their presence, absence, and timestamps can confirm whether a particular component failed before or after an accident occurred.

Freeze-Frame Data: Many control modules record a snapshot of key sensor values at the instant a DTC is set. This “freeze frame” may include data such as vehicle speed, engine RPM, throttle angle, and load at fault occurrence[9]. For example, if an airbag deploys, the associated collision DTC may include a pre-crash speed and brake status. Similarly, an engine misfire DTC might show exact RPM and temperature when the fault tripped. This contextual data helps surveyors correlate mechanical readings with the damage scene. As forensic practitioners note, every control module typically saves freeze-frame data with the code[9]. Although limited in scope, such snapshots can relate directly to accident circumstances if the fault occurred during the event[10][9].

ECU Data Logs and Status Flags: Beyond freeze frames, many ECUs maintain running logs or status flags. For example, telematics units often

log daily mileage and trip data, while advanced ECUs may flag limp-mode, traction control events, or system resets. Newer vehicles may allow retrieval of the engine controller’s recorded sensor traces (via dealer software) or the airbag module’s stored crash sequence. In practice, surveyors should attempt to extract any crash-relevant flags (e.g. “ABS active”, “brake override”) and event records. While proprietary and often requiring OEM tools, these data serve as additional evidence. The growing field of automotive forensics emphasizes using on-board logs (similar to digital device logs) to verify collision details[3][7].

In summary, modern scanning tools can reveal hidden data: confirmed DTCs, pre-fault parameter snapshots, and ongoing ECU logs. Surveyors equipped with these diagnostics are not limited to visual clues, but have the vehicle’s own memory to consult when assessing a claim.

Application of Diagnostic Data in Claim Assessment

Diagnostic data enhance claim assessment in several concrete ways. First, pre-accident speed can sometimes be estimated or bounded. For instance, if the EDR or an ABS controller log shows speed just before impact, the surveyor can check if it matches the reported scenario. Second, brake and throttle inputs are often recorded; a lack of braking deceleration when claimed (or vice versa) may indicate misreporting. Third, DTCs that surface immediately after collision (such as “left front sensor

malfunction”) can pinpoint impact locations or secondary damages. Also, comparison of odometer or trip data (from telematics) before and after the incident can reveal if the engine was restarted post-crash, contradicting a “no-start” claim.

Practically, a surveyor might run the vehicle to identify active faults (e.g. bent suspension geometry causing wheel speed discrepancies flagged by ABS). Freeze-frame values can be cited in reports: for example, “ECU recorded speed of 68 km/h and closed throttle at fault trigger,” supporting the narrative of emergency braking. In warranty/recall contexts, technical bulletins often recommend capturing ECU logs. In claims, similarly, the digital evidence can shift a case: as one study notes, diagnostic records provide important info on “vehicle status and user behaviors,” beyond what visual exam shows[4][2]. Overall, consistent diagnostics reporting can transform a survey report from subjective observation to data-backed conclusions.

Role in Fraud Detection and Claim Validation

Objective vehicle data are potent in spotting fraudulent or exaggerated claims. For example, if a claimant alleges high-speed collision but diagnostic logs show the engine was idling for minutes after the supposed crash, that discrepancy is suspect. Mileage rollback or inconsistent trip data may signal odometer fraud. Abnormal wear codes (e.g. continuous overheating) can indicate pre-existing damage. Insurers have found telematics data can also

help flag fraud: behavioral patterns inconsistent with claimed loss have been used to distinguish legitimate from fraudulent claims[5][11]. In one analysis, adding telematics variables to risk models significantly improved selection and helped identify high-risk or false-reporting drivers[5]. While vehicle sensors alone can’t prove dishonesty, they provide quantifiable checkpoints. If a damage surveyor notes impact evidence, they can check it against logged deceleration or airbag deployment records. Discrepancies may prompt further investigation or involve forensic experts. In summary, diagnostic data add a layer of verification that deters opportunistic fraud and validates genuine incidents.

Advanced Vehicles: ADAS, Electric and Hybrid Systems

New vehicle technologies present both challenges and opportunities for diagnostics in claims. Automatic braking and lane-keep assist are examples of Advanced Driver Assistance Systems (ADAS) that produce their own data. As one recent study explains, identifying ADAS engagement in real-world driving is crucial for liability and claim attribution[7]. Traditional EDRs (focused on crash pulses and basic speed traces) do not log ADAS status, so surveyors must find other clues. CAN-bus logs may show when a “warning” or “autobrake” flag was active. For instance, some manufacturers store whether forward-collision warning was issued just before impact. The multimodal ADAS study shows that ADAS changes vehicle behavior (smoother steering,

speed control) and suggests new data fields should be standard in future EDRs[7].

Electric and hybrid vehicles likewise produce distinctive logs. High-voltage battery management systems record state-of-charge and fault events. Regenerative braking status and electric motor load are often logged. Research indicates that OBD-II ports on EVs can yield data on the battery pack and motor states, although some parameters (battery cell balancing details) may be missing[12]. Surveyors should consult EV diagnostic tools for battery faults or drivetrain issues post-collision. Crucially, EV crash data is still under development, but studies suggest combining multiple logs (telematics, manufacturer cloud data, and existing EDR) yields the most complete picture[13][14]. As these vehicle classes become common, being aware of the extra sensor feeds (e.g. electric motor RPM, battery voltage trends) will help assess damage plausibility and repairability.

Documentation and Reporting Benefits

Incorporating diagnostic outputs into survey reports greatly enhances documentation quality. Instead of solely narrative descriptions, a surveyor can append printed DTC lists and freeze-frame snapshots. This objective data can be archived in claim files, supporting transparency. Insurers and repair shops value this; structured reports that include ECU readouts are more defensible in disputes. For example, a “Data Log Summary” section in the report might state: “Freeze-frame data

recorded engine speed=2500 rpm, throttle=0%, vehicle speed=50 km/h at fault onset". Such specificity is far clearer than "the engine was running at moderate speed".

The benefits extend beyond claims. Many insurers are now aggregating anonymized diagnostic data for trend analysis and liability research. A surveyor trained in retrieving and interpreting logs adds a valuable feedback loop to risk management. Ultimately, routine inclusion of diagnostic evidence builds a standardized best-practice. Several forensic investigators emphasize that vehicle diagnostic data is a "key source of digital evidence" in crash reconstruction[3][4]. For surveyors, citing technical data lends professional rigor: it shows that conclusions (for example, an identified mechanical pre-failure) are rooted in quantifiable readings, not guesswork.

Limitations and Ethical Considerations

Despite its promise, reliance on vehicle data has constraints. Not all vehicles support advanced logging; older cars may only report current DTCs and lack freeze-frame. Even when data exist, tools to retrieve it may be proprietary or require manufacturer licensing. There is also the risk of data tampering or missing data: attackers could clear codes, or a completely disabled module may erase stored records. Ensuring chain-of-custody for digital evidence is crucial. Indeed, recent research warns that the integrity of forensic vehicle data can be undermined by tampering, leading to proposals

for blockchain-based protection of logs[15].

Privacy and ownership are ethical issues. Vehicle logs often contain personal travel data. Who owns the data – the driver, owner, or insurer? Laws vary by jurisdiction. Surveyors should obtain proper authorization before downloading any log. For example, GPS logs or camera recordings (when present) may raise privacy flags. EU regulators (GDPR, IDD) stress transparency if insurers use personal driving data[8]. In practice, an adjuster should inform claimants if diagnostic data will be accessed and comply with data protection rules. Finally, technical limitations mean data is not infallible: sensors have tolerances, and EDR measurements can differ slightly from true values[16][17]. Surveyors must interpret data conservatively and explain uncertainty (e.g. "≈50 km/h").

Best-Practice Guidelines for Surveyors

Based on current knowledge and experience, the following best practices are advised:

- **Use Standard Tools:** Employ manufacturer-approved scanners or widely-used OBD-II tools. Ensure the device is up-to-date on vehicle coverage.
- **Capture Data Early:** Perform scans before resetting codes or starting repairs. Take photos of on-screen data. Freeze-frame should be recorded immediately after retrieving DTCs.
- **Document the Process:** Note the scanner make/model,

software version, vehicle ignition cycles performed, and any discrepancies. Maintain a written log of who accessed data and when.

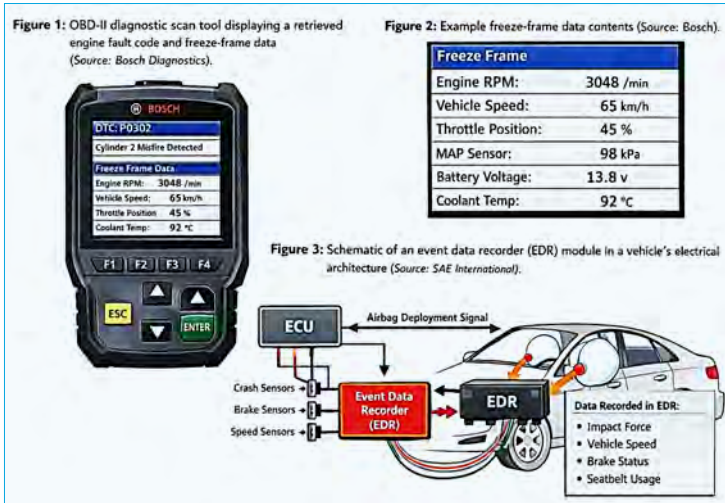
- **Cross-Verify Data:** Compare ECU readings with physical evidence (brake marks, collision angles). If data conflicts with the claimed scenario, flag for further review.
- **Use Multiple Sources:** If available, obtain data from EDR (if airbags deployed), telematics logs, and even vehicle gateway modules. Composite analysis (as demonstrated in Tesla forensic studies) yields greater reliability[13][18].
- **Interpret with Caution:** Some DTCs may be generic or intermittent. Do not overstate causality (e.g. a crash-triggered fault does not always imply crash cause). Describe what the data shows and any assumptions made.
- **Follow Privacy Rules:** Get written consent or legal authority to download data. Secure any personal data according to policy.
- **Stay Informed:** Vehicle systems evolve rapidly. Surveyors should seek regular training on new diagnostic systems (e.g. ADAS event codes, EV battery diagnostics) and follow industry bulletins.

Adhering to these guidelines will help surveyors integrate objective vehicle data smoothly into the claim process, improving accuracy without compromising ethics.

Conclusion

The inclusion of vehicle diagnostic data transforms motor claim assessment into a more evidence-based practice. DTCs, freeze-frame parameters, and ECU logs offer factual snapshots of a vehicle's condition around the time of loss. As vehicles advance (with ADAS and electrification), these data become richer and even more essential. When surveyors combine traditional inspection with data retrieval, they strengthen their conclusions on causation, liability, and fraud. Although access and interpretation pose challenges, the trend is clear: insurers and repairers will increasingly demand objective data to support reports. Surveyors who embrace these tools will provide more complete, defensible appraisals. In short, leveraging objective vehicle data elevates the professionalism and reliability of motor loss assessment.

Figures



- **Figure 1:** OBD-II diagnostic scan tool displaying a retrieved engine fault code and freeze-frame data (source: Bosch Diagnostics).
- **Figure 2:** Example freeze-frame data contents, showing vehicle speed, RPM, throttle position, and other parameters at fault time (source: Bosch).
- **Figure 3:** Schematic of an event data recorder (EDR) module in a vehicle's electrical architecture, capturing sensor signals on airbag deployment (source: SAE International). 

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Wellness: The Missing Piece in Health Insurance Puzzle



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Ankit is a B.Tech graduate in IT with more than 15 years of experience, including 12 years of experience in the insurance industry. Working as Senior Manager in Head Office, United India Insurance Company Ltd., he is currently on deputation to Department of Financial Services, Ministry of Finance, New Delhi. He also has prior experience of working in Insurance Ombudsman Office, Bengaluru. Ankit is a Fellow of Insurance Institute of India and has contributed with over over half a dozen articles for III Quarterly Journal.

Abstract

COVID-19 made people realize two important things – need to follow a sound wellness and hygienic regime and have a basic health insurance policy. The society, Governments and health industry at large found itself in middle of health care crises that led to numerous reforms in health sector and focus on medicare post the pandemic. Further, with annual healthcare inflation hovering at 12-14% in India, outpacing inflation, earnings growth and eroding years of savings, health insurance has become more than a financial product or a risk management offering; it is now being perceived as a lifeline against the unpredictability of medical emergencies, especially when burden of medical expenses outweighs treatment and lives. This is also evident from the statistics, with gross health insurance premium underwritten by companies more than doubling in 5 years since the pandemic struck.

Further, the National Health Policy 2017 too has laid the strategic roadmap for government to

universalize health coverage, with objective of improving health status through concerted policy actions in all sectors and expanding preventive, promotive, curative, palliative and rehabilitative services provided through the public health sector with focus on quality. The policy commits increasing public health expenditure to 2.5% of GDP by 2025 with primary goal of attainment of the highest possible level of health and wellbeing for all. The holistic approach, encompassing AYUSH, telemedicine, and digital health records under Ayushman Bharat Digital Mission aims to transition Indian healthcare delivery from sickness care to wellness oriented. Under this, India has been steadily strengthening the public healthcare infrastructure, making services more affordable and accessible to the public, with per capita Government Health Expenditure tripling from ₹1,108 to ₹3,169 between 2014-15 and 2021-22 as per the National Health Accounts (NHA) data.

Keywords

Health Insurance, Wellness,

Ayushman Bharat, Regulatory Sandbox.

Introduction - Health V/s Wellness

Before we delve into unlocking myriads of terminologies and statistics, it is important to understand what health actually means.

Cambridge dictionary defines health as

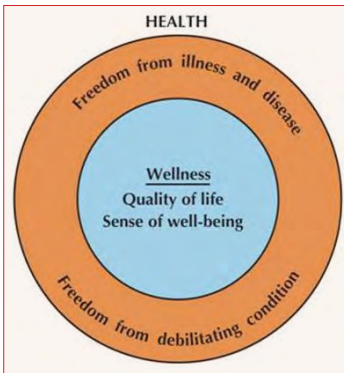
the condition of the body and the degree to which it is free from illness, or the state of being well

Merriam Webster dictionary defines health as:

the condition of being sound in body, mind, or spirit

In 1948, the World Health Organization (WHO), a specialized agency of United Nations responsible for International Public Health, defined health as:

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.



Health in broader terms is a measure of one's overall well-being. But how does one achieve that state. For decades, researchers, public health professionals and medical community have been trying to figure out various factors that influence health. From genetics and environment to socioeconomic conditions, the picture is complex. However, one of the most powerful and accessible pathways to achieving and maintaining good health that emerges is by embracing **wellness**.

Though the terms “health” and “wellness” are often read in conjunction with general perception of having a similar meaning, yet one shouldn't get confused as wellness is distinct concept from health and understanding the difference is key to making meaningful improvements in life. Health is primarily a state of being — the outcome or condition one aims for. Wellness, in contrast, is an active, ongoing process — the daily journey towards that state.

The Global Wellness Institute defines wellness as

the active pursuit of activities, choices and lifestyles that lead to a state of holistic health.

Health reflects the current status of our body and mind: free from disease, functioning optimally, and in balance across physical, mental, and social dimensions. It may be influenced by number of factors which are sometimes out of our control like genes, age, family history etc. Wellness, on the other hand, involves making conscious decisions in day-to-day life to control risk factors e.g., eating sensibly, exercising, regular health check-ups etc.

One way to understand wellness is to consider health as a continuum that extends from illness to a state of optimal wellbeing. On one end, patients with poor health engage with the medical paradigm to treat illnesses; they interact reactively and episodically with doctors and

clinicians who provide care. On the opposite end, people focus proactively on prevention of such occurrences and maximizing their vitality. They adopt attitudes and lifestyles that prevent disease, improve health, and enhance the quality of life and sense of wellbeing. Health is a condition of physical, emotional, mental, and social well-being, while wellness relates to balancing the above four parts to achieve a state of good health. Neglecting these areas, even if someone appears “healthy” on medical tests, can gradually erode well-being. Conversely, prioritizing wellness habits may often lead to better measurable health markers — lower blood pressure, improved mood, stronger immunity — and a greater sense of fulfillment.

Health Continuum		Optimal State Of Well-being
Poor Health		
Medical Paradigm		Wellness Paradigm
Feel better		Thrive
Treat & cure illness		Maintain & improve health
Corrective		Preventive
Episodic		Holistic
Clinical-responsibility		Individual responsibility
Compartmentalized		Integrated into life

Source: Global Wellness Institute

Ultimately, true well-being isn't just about avoiding sickness; it's about thriving through intentional, daily choices. By embracing wellness as an active lifestyle rather than a passive state, one can empower himself/ herself to not only achieve good health but sustain and enrich it throughout life. Small, consistent decisions today can truly build the foundation for a healthier, more vibrant tomorrow.

How Health Insurance and Wellness Relate to Each Other?

The end goal of both health insurance and wellness is to enable a person lead a healthy life. Both can be described as mutually exclusive subset of

risk management technique. While wellness comes under the ambit of precaution and prevention technique - with promotion for healthy lifestyle choices, health insurance on the other hand is function of a risk transfer mechanism - to manage and address the outcome of occurrence of specified health events. While neither of these approaches on its own can guarantee good health, however combining both provides a powerful mechanism to lead a healthy life. In simple words, combining health insurance and wellness provides a 360-degree coverage in pursuit towards attaining good health and well-being.

Health Insurance - Traditional View

Health insurance policies are used as a protective measure to cover up for monetary losses due to happening of covered health risks. Typically, this ecosystem has been largely fragmented – with beneficiaries covered under either:

- Social Health Insurance (SHI) schemes that are structured around specific occupation-based groups and operate under the administration of different central government ministries/ departments, where each scheme maintains its own distinct governance, benefit packages, contribution rules, and networks of healthcare providers (hospitals, dispensaries, and empaneled facilities). E.g., Employees State Insurance Corporation (ESIC) scheme or Central Government Health Scheme (CGHS).
- Tax-funded Government schemes that are primarily publicly financed and target the most vulnerable section of the society, primarily for inpatient services at secondary and tertiary levels. E.g., like Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) or schemes implemented by individual States with varying coverage and benefit packages, often with deviation or extension of the central PMJAY model.
- Commercial health insurance opted by individuals by remitting premiums in their personal capacity, to cater to their personal needs.

Together, all these schemes cover nearly two-third of the population in India. Yet, none of health insurance schemes have tried to address the actual underlying risk upon which the insurance contract is based – attaining good health by adopting wellness measures.

Though the IRDA Health Regulations issued as early as in 2013 (and later replaced in 2016) had provisioned for promoting wellness measures under health insurance contracts, including offering renewal discounts or incentives/ rewards for maintaining good health, but little progress has been made in this direction. In fact, the irony has been such that the health insurance contracts have been based on quantitative aspect instead of qualitative criteria. Thus, even if one is in excellent state of health, there may be situations where no benefit is extended for it. E.g., even if customer aged 40 follows an

active healthy lifestyle compared to a customer aged 28 with a largely lethargic attitude towards fitness; chances are that latter may enjoy lesser premium outgo due to certain actuarial calculations. Moreover, the terms under indemnity-based policies are so restrictive that they do not provide for any financial assistance where medical investigation or diagnostic tests are carried out without any active line of treatment or does not result in diagnosis of a covered health ailment or medical condition. In certain cases, insurance companies may also deny coverage for certain medical conditions which are contrary to underwriting decisions, even if such health conditions can be routinely managed through active lifestyle and regular medical care/ advice. Insurers often restrict payments for advance treatment procedures, if a comparable medication of generic nature is available at a lower cost, often neglecting the premium payable for the quality of care. Increasingly, health insurance plans have been using co-pay clauses, which is fraction of claim amount that insured must pay themselves or deductibles that must be met before health insurance will cover or pay for a claim. The terms in insurance contracts are often so worded that sometimes the insured are just in illusion of being completely protected against healthcare costs, only to realize at the time of claim the nitty-gritty of the agreement, and left lurking for not choosing adequate coverage option. According to the survey conducted by an insurance company in April 2025, nearly two

out of three insured Indians say they felt vulnerable and financially exposed when they had to make an insurance claim.

However, the regulator has been implementing reforms that aim to simplify health insurance in India. The recent mandates to health and general insurers to offer - (i) a standardized basic health insurance policy with uniform benefits and wordings; and (ii) health insurance to everyone, regardless of age, existing medical conditions, geographical presence, occupational categories etc. are steps taken in this direction. Further, the regulatory sandbox approach gives major leeway to industry to experiment and innovate, and offer such products that cater to hitherto unmet requirements of the customers and increase the ambit of insurance coverage in the country.

Evolving Landscape of Health Insurance and Wellness

Though having a health insurance policy is always recommended, but one should not forget the wellness part. Health insurance is fundamentally a reactive safety net and comes to play only after occurrence of a specified covered health risk. At best, it can only make up for the monetary loss arising out of the covered event, but cannot undo the adverse health effect or long-term health damage caused by the illness or injury itself. In contrast, with a proactive approach of following healthy lifestyle choices along with conscious decision making, one can avert, delay or at least minimize the health damage. Not only by taking good care of our health it increases

our vitality, but also by minimizing reporting of such preventable minor claims under health insurance policy, one can gain the benefits from discounts given on account of favorable claim experience or reduced premium outgo on account of better life/health risk. Thus, one should look at health insurance policy as a buffer mechanism for continuity of life, with primary emphasis to be laid on wellness aspect.

Realizing this point, insurance companies have also now started coming up with various innovative solutions and health insurance products which include wellness and preventive benefits. More and more plans are now offering free annual medical check-ups, with few insurers even lifting earlier restrictions on the policy of being claim free during the preceding year to be eligible for such benefit. The argument in favor of including wellness and preventive benefits in insurance policies is based on simple premise that it would aim to protect insurer's own portfolio by significantly bringing down the claims ratio by improving/ monitoring the individual policyholder's overall health and addressing any health-related concerns at the onset/ preventive/ curative stage. This modern view, that not only provides value to policyholders by avoiding unnecessary treatment and hospitalization which in turn bring down the insurer's costs, but also helps the insurance industry to promote preventive measures and contribute in bridging the significant health protection gap. With technological innovations and everyday use low cost devices,

insurers are able to track vital health parameters and offer personalized health offerings, including discounts in premium or additional benefits on continuous renewals. The sole objective of incorporating these wellness benefits is to focus on building an outcome-based preventive structure in order to promote a healthy lifestyle.

What is a Regulatory Sandbox Approach?

Traditionally, insurance companies quantified coverage on basis of an arithmetic evaluation of pool of similarly placed risks. Data analytics and Predictive Models were extensively used by insurers to understand the risks they take on as part of their core business. Over the time, insurance companies are now finding that technology can help them assess risks better but the emerging technological innovations in insurance are posing new challenges and questions to regulators. The conventional risk pool mechanisms are bound to be challenged as there is increasing demand to move towards individualistic pricing approach with the use of InsurTech solutions. Insurers need to be more agile in catering to increasing demands and needs of consumers for customized tailor-made solutions, while safeguarding their own interests and not falling into traps of insurance frauds. This may require out-of-box thinking solutions. However, the practical application of such solutions into an end-user product is subject to regulatory approvals wherein the regulator prioritizes the interest of policyholders. To resolve this

deadlock like situation, IRDAI has come up with concept of Regulatory Sandbox.

Regulatory Sandbox Approach helps insurance companies to leverage latest technological innovations and apply them to out-of-the-box solutions in a dynamic manner so as to create newer unconventional insurance products, including offerings that promote wellness. The IRDAI (Regulatory Sandbox) Regulations, 2019 provides the flexibility in dealing with regulatory requirements while fostering innovative ideas in insurance industry and at the same time focuses on policyholder protection. The IRDAI's latest Regulatory Sandbox Approach carves out a safe and conducive environment to experiment with innovative approaches (including Fin-Tech solutions), and where the consequences of failure, if any, can be contained. Such an environment work within a well-defined space and duration. Some of the innovative ideas that have been use cases for such innovations include encouraging Wearable Fitness Tracker based Health Insurance products, integrating OPD and Wellness with integrated flexible rewards program, app monitored wellness programs etc.

Conclusion

The World Health Organisation has devised an index, known as the UHC Index (Universal Health Coverage Service Coverage Index), which combines 14 tracer indicators into one number, more specifically a score between 0-100, to measure access to essential health services (like reproductive, infectious disease,

and NCD care), and gauge progress towards Sustainable Development Goal 3.8. As of 2023, India's UHC Service Coverage Index (SCI) was 69 against the global average of 71. This has been largely possible due to dual thronged approach adopted by Government of India: strengthening primary care through Health and Wellness Centres (HWCs) and expanding health insurance coverage through the AB-PMJAY for secondary and tertiary care.

Though government is trying to provide health coverage as a basic right to every citizen of India, yet there is a lot of path to be covered in future, which seem full of challenges. It is estimated that ~40% of total medical expenses are self-funded in India, and a major reason for pushing millions of people towards the poverty line. A Niti Aayog 2021 report estimates that 7% of India's population is pushed into poverty every year due to the amount of money spent on healthcare, with certain media reports indicating that an average household is just a hospitalization away from falling prey to jaws of poverty.

The recent reforms like reduction of Goods and Services Tax (GST) on individual health insurance policies or industry's commitment to mass scale awareness programs have cheered the stakeholders and created the euphoria for apparent uptick in health insurance penetration. But the more pertinent question still remains – what is the best possible way to address our health issues? Each and every one of us would have encountered at least one or more health issues in our lifetime - no matter how much we

strive to keep ourselves healthy and fit. That is when healthcare facilities and medical help come to our aid and rescue, but rising healthcare costs acts as a barrier to access the best healthcare facilities. Health insurance can help to address this concern, but it may not be the final answer for achieving optimum health. Optimal health comes from wellness, from making decisions and practicing behaviors that are based on sound health knowledge and healthy attitudes.

One may not be able to choose the state of his/ her health. High cholesterol and blood pressure are largely genetic. People may be born with heart disease and a predisposition toward diabetes. Accidents may cause injuries that last a lifetime. Health insurance may provide cushion for financial shocks arising in case of such unforeseen medical emergencies subject to coverage terms and conditions provided in the policy contract. But wellness is a way for us to actively work towards better health in daily life and prevent non-accidental health damage or post-damage recovery. It is a way to take partial control of our bodies and minds. Even though none of us may ever be in "perfect" health, but making a conscious effort to focus on wellness can make one feel better — and ultimately, minimize our reliance on just health insurance alone down the line. With rising medical costs and limited medical resources, it is also time that industry should offer such products that promote wellness among customers in order to create a sustainable and conducive healthy

environment - both for policyholders and insurance industry. Health insurance and wellness may or may not entirely account for all the missing pieces of health puzzle, but surely they should go hand in hand in one's quest toward complete well-being. The general idea going forward under health insurance should be

that if people are encouraged for regular checkups, adhere to their prescribed medication regimen, and get recommended vaccines, health problems can either be completely prevented, or at least managed before they become extraordinarily expensive. With the integrated approach of combining wellness

benefits with health insurance, it certainly presents a win-win for both customers and companies. While customers will feel encouraged to maintain good health by following healthy lifestyle, for companies, it provides an alternative way of managing risk. **T**

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AI-Driven Insurtech Revolution: Transforming Underwriting, Cybersecurity, and Inclusive Micro-Insurance in Emerging Markets



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Sonal Agrawal is a dynamic entrepreneur with a strong foundation in IT and an MBA in HR. She is passionate about harnessing technology to revolutionize health and insurance services, making them more accessible and affordable for last-mile citizens. With a deep understanding of InsurTech, she has been instrumental in developing innovative solutions that bridge critical gaps in service delivery.

Abstract

In 2026, the insurance sector faces unprecedented challenges, with global cyber incidents surging 25% year-on-year and reaching \$10.5 trillion in projected costs, while 2.5 billion people in emerging markets remain uninsured amid climate volatility (Deloitte, 2025). This paper explores the AI-driven insurtech revolution transforming underwriting, cybersecurity, and inclusive micro-insurance, particularly in India. Picture a rural farmer in Maharashtra receiving instant flood coverage via a UPI-linked app, as AI analyzes satellite imagery for precise risk scoring and blockchain fortifies data against ransomware attacks that paralyzed 40% of Indian insurers last year.

We dissect AI's prowess in underwriting, boosting claim prediction accuracy to 95% through neural networks integrating telematics and wearables, yet confronting pricing biases that disadvantage low-income groups. The analysis shifts to cybersecurity, where real-

time anomaly detection shields policyholder data in blockchain ecosystems, drawing from Singapore's cyber pools that cut breach losses by 35%. Finally, it highlights insurtech's blitz for inclusion, with platforms like Paytm delivering parametric micro-policies to 500 million underserved Indians, automating payouts and slashing acquisition costs by 60%.

This convergence promises a resilient ecosystem: AI underwriting feeds cyber scores into affordable micro-plans. However, ethical pitfalls like algorithmic bias and privacy risks demand fairness audits and IRDAI-guided sandboxes. By 2030, this synergy could boost penetration by 30%, forging equitable protection in a hyper-connected world. Insurers must act now to harness this triple-threat innovation.

Keywords

AI Underwriting, Insurtech Revolution, Cybersecurity Insurance, Micro-Insurance India, Algorithmic Bias, Blockchain Security, Parametric

Insurance, Emerging Markets, Risk Prediction, Digital Inclusion.

Introduction

The global insurance industry stands at a crossroads in 2026. Premiums are projected to hit \$8.5 trillion worldwide, yet penetration in emerging economies lags at just 4 percent of GDP, compared to 11 percent in advanced markets (Deloitte, 2025). In India alone, only 18 percent of adults hold life insurance, leaving over a billion people exposed to risks from climate disasters to cyber threats (IRDAI, 2025). Enter insurtech: a fusion of artificial intelligence, blockchain, and digital platforms that promises to bridge these gaps. This paper explores how AI supercharges underwriting for pinpoint risk assessment, erects formidable cyber defenses, and democratizes micro-insurance for the underserved. At stake are not just trillions in untapped premiums but the very resilience of economies battered by pandemics, floods, and hacks.

Consider the scale of the challenge. Cyber incidents cost insurers \$12 billion in claims in 2025, with ransomware attacks surging 65 percent year-over-year (Grant Thornton, 2026). Meanwhile, natural catastrophes wiped out \$320 billion in economic losses globally, but insurance covered only 40 percent, creating massive protection gaps in places like India where monsoons devastate rural livelihoods (Swiss Re, 2025). Traditional underwriting, reliant on manual data and broad actuarial tables, often misses these nuances, leading to overpriced policies or outright denials for low-income groups. AI changes that equation. Neural networks now analyze vast datasets from wearables, IoT sensors, and social media to predict claims with 95 percent accuracy, slashing costs by up to 30 percent (McKinsey, 2025). Indian startups like Paytm Insurance exemplify this, using telematics to tailor motor premiums for gig drivers, boosting adoption by 25 percent in urban centers.

Yet innovation breeds peril. Algorithmic biases in AI models have inflated premiums for marginalized communities by 15-20 percent in pilot programs, echoing historical redlining (IAIS, 2026). Cyber vulnerabilities compound the issue: adversarial AI can fool detection systems, as seen in the 2025 breach of a major Asian insurer that exposed 2 million policyholders' data. On the inclusion front, while apps like Kenya's M-Pesa-inspired BimaCab deliver parametric micro-policies to

500 million Indians via Aadhaar-linked mobile wallets, scalability falters without robust security. Blockchain offers a fix, with tamper-proof ledgers ensuring trust, but adoption hovers at 12 percent in emerging markets due to interoperability hurdles (World Bank, 2025).

This revolution is already underway in India, fueled by regulatory tailwinds. The Insurance Regulatory and Development Authority of India (IRDAI) reported insurtech penetration jumping 40 percent in 2025, with 150 new digital-first firms entering the fray (IRDAI, 2025). Pilots like Acko's AI-cyber bundle for MSMEs cut exclusion rates by 30 percent, proving the power of integrated platforms. Singapore's Cyber Insurance Pool, launched in 2025, mirrors this success, pooling resources to cover \$500 million in risks and deterring attacks through shared AI intelligence (Monetary Authority of Singapore, 2026). These examples ignite hope: insurtech could lift 300 million Indians into coverage by 2030, transforming vulnerability into security.

But triumph demands vigilance. Ethical pitfalls, from biased training data to privacy erosions under lax data laws, threaten to derail progress. How can insurers harness AI's speed without sacrificing fairness? Can cyber shields evolve faster than threats? Will micro-insurance truly reach the last mile, or remain an urban mirage? This 5000-word paper tackles these questions head-on, weaving a narrative across five core sections.

First, it unpacks AI's ascent in underwriting, from data-crunching powerhouses to bias-busting reforms. Next, it confronts the cyber siege, spotlighting real-time defenses and blockchain fortresses. The third section unleashes insurtech's inclusion blitz, with mobile triumphs and parametric payouts. The climax reveals their synergy in holistic ecosystems, backed by India-specific pilots. Finally, it navigates storm clouds of ethics and regulation, charting a bold path forward.

Insurers, regulators, and innovators: the AI-insurtech revolution is not a distant horizon. It is here, demanding action to forge equitable shields in a hyper-connected world. This paper equips you with the insights to lead it.

The AI Underwriting Powerhouse

Underwriting has long been the backbone of insurance, turning raw data into premiums that balance risk and reward. In 2026, AI elevates this to a powerhouse level, processing terabytes of information in seconds to deliver decisions once taking on days. Traditional methods relied on underwriters sifting through forms and spreadsheets, often missing subtle patterns. AI flips the script, using machine learning to scan credit histories, claims records, telematics feeds, and even social behaviors for a 360-degree risk view.

The numbers tell a compelling story. AI slashes standard policy decision times from three to five days down to 12.4 minutes, while holding risk assessment accuracy at 99.3 percent (BizTech Magazine, 2025).

For complex cases, processing speeds up by 31 percent, with accuracy jumping 43 percent (BizTech Magazine, 2025). Machine learning boosts overall precision by 54 percent, enabling finer risk pricing (Appinventiv, 2026). In India, where the generative AI market hit INR 85.34 billion in 2024 and eyes INR 671.83 billion by 2030 at a 42 percent CAGR, insurers lead the charge (Research and Markets, 2025).

Take Acko General Insurance, a unicorn valued at \$1.1 billion. Their AI platform personalizes motor and health policies using telematics from connected cars, adjusting premiums dynamically for safe drivers. This cut claim costs by 20 percent and drew 10 million users, proving AI's pull for gig economy workers (Decentro, 2025). Similarly, Digit Insurance deploys AI for automated claims and risk profiling, turning hours-long processes into instant approvals. RenewBuy and PolicyBazaar aggregate data across providers, feeding AI models that recommend tailored covers, growing their user base to 50 million (Billcut, 2025).

Regulators sound alarms. The National Association of Mutual Insurance Companies warns that vague "fairness" rules could distort risk pools, forcing low-risk customers to subsidize high-risk ones (Browne Jacobson, 2025). India's IRDAI mandates bias audits in 2026 guidelines, pushing for transparent models.

Solutions are emerging fast. Explainable AI (XAI) tools like SHAP illuminate decision paths, showing

why a premium rose. Fairness interventions retrain models on diverse datasets, cutting bias by 40 percent in tests (Kanerika, 2026). Federated learning lets insurers share insights without exposing data, building robust profiles for thin-file applicants. Acko integrates these, achieving 92 percent fairness scores while maintaining accuracy.

Real-world wins abound. In 2025, a coalition of Indian insurtechs piloted XAI for health underwriting, reducing disparities for gig workers by 25 percent and boosting enrollment 18 percent (Zopper, 2025). Globally, Lemonade's AI engine processes 95 percent of claims instantly, with human oversight for edges, blending speed and equity.

India's edge shines bright. With 16 percent of global AI talent and infrastructure like Aadhaar and UPI, the country commissions 45 new data centers in 2025, fueling AI growth (IBEF, 2025). IRDAI's sandbox tests let firms like Pazcare refine employee health plans, integrating AI for 30 percent faster renewals.

Challenges persist. Data privacy under DPDP Act 2023 requires anonymization, slowing models. Compute costs for training remain high, though cloud providers cut them 50 percent yearly. Scalability tests insurtechs: Acko handles millions, but smaller players struggle.

Insurtech's Inclusion Blitz: Micro-Insurance Unleashed

Imagine a street vendor in Delhi's bustling markets, juggling daily

wages and the threat of monsoon floods. In 2025, she downloads an app, links her UPI ID, and secures a Rs 500 crop-loss policy for Rs 10 a day. A heavy downpour hits. The app's sensors trigger an automatic payout of Rs 5,000 within hours, no paperwork needed. This is micro-insurance unleashed, powered by insurtech platforms that blanket India's 500 million underserved with coverage once deemed impossible. Low premiums, high reach, instant service: these tools turn vulnerability into victory.

Micro-insurance targets low-income groups with policies under Rs 50,000 in coverage, tailored for farmers, gig workers, and informal laborers. In India, penetration hovers at 12 percent, but insurtech flips that script. Platforms now serve 250 million users, a 50 percent jump since 2024 (IRDAI, 2025). Parametric designs pay out based on triggers like rainfall below 50 mm or cyclone winds over 100 km/h, bypassing lengthy claims. This speed slashes costs by 70 percent, making insurance viable for the base-of-pyramid masses (World Bank, 2025).

Blockchain adds ironclad trust. Tamper-proof ledgers record policies and payouts, eliminating fraud that plagues 20 percent of traditional claims. Kenya's M-Pesa model inspired India's DigiShakti, a 2025 blockchain platform by ICICI Lombard and Kaleido. It handles 10 million micro-transactions daily, reducing disputes by 90 percent. For gig workers, NFT-like smart contracts release funds on verified events, like a

delivery rider's accident confirmed by GPS (ICICI Lombard, 2025).

Real triumphs light the way. In Bihar floods of 2025, parametric policies from Cropin insured 2 million farmers, disbursing Rs 1,200 crore instantly and stabilizing local economies. Tamil Nadu's fishers use Saturn Cash's weather-linked boat covers, with 80 percent renewal rates due to reliable service. MSMEs gain too: Zopper's 2026 platform bundles cyber-micro for shops, covering data breaches up to Rs 10 lakh for Rs 200 monthly (Zopper, 2026).

Synergy Unleashed: The Triple-Threat Convergence

The true magic happens when AI underwriting, cyber shields, and micro-insurance platforms fuse into one unstoppable force. This triple-threat convergence creates "insurtech ecosystems" where data flows seamlessly, risks predict themselves, and coverage reaches every corner. In 2026, these integrations turn isolated tools into a living network, slashing vulnerabilities and unlocking \$50 billion in new premiums for India by 2030 (McKinsey & Company, 2026). Picture an MSME owner in Bengaluru: AI scores her business risk low based on sales data, bundles cyber protection against hacks, and wraps it in a daily micro-policy paid via UPI. One app, total security.

Quantifiable impacts dazzle. Integrated platforms boost risk-adjusted returns by 22 percent and cut customer acquisition costs 45 percent versus siloed products (Boston Consulting Group, 2026). Penetration jumps: pilots

show 35 percent uptake among unbanked users, versus 10 percent for standalone micro-insurance. IRDAI data reveals 150 sandbox-approved ecosystems in 2026, fueling a 28 percent insurtech growth rate. Globally, Singapore's model influenced India's Cyber-Micro Fusion mandate, requiring bundles for high-risk sectors by 2027 (IRDAI, 2026).

Real-time examples electrify. During the 2025 Mumbai ransomware wave, PlumHQ's converged app protected 500,000 policyholders. AI underwriting adjusted cyber limits upward for vulnerable retailers, while micro-pools shared reinsurance loads, containing losses at Rs 150 crore. Gig platforms like Swiggy integrated it natively: drivers get dynamic premiums blending accident underwriting, cyber cover for app data, and daily micro-health, with 85 percent retention (PlumHQ, 2026). In agriculture, Cropin Technology's 2026 AgriStack links 3 million farmers to ecosystems where AI predicts pest risks (underwriting), blockchain secures supply chain data (cyber), and satellite triggers disburse micro-funds instantly.

Regulatory green lights accelerate the surge. IRDAI's 2026 Composite License allows single-app bundles, while RBI's digital rupee pilots enable frictionless micro-payments. Public-private hubs like iSPIRT's Insurance Stack test convergences at scale, drawing \$500 million in venture capital. By 2030, forecasts predict 60 percent of India's \$250 billion insurance market will run on these ecosystems, lifting 300 million into coverage (NITI Aayog, 2026).

This synergy solves core puzzles. Thin-data users get accurate underwriting via cyber-sourced behaviors. Cyber defenses strengthen with micro-usage patterns. Micro-policies scale through AI efficiencies. Challenges like API silos fade as open standards emerge, with 70 percent of insurtechs now interoperable (Finnovate, 2026).

The triple threat is no experiment. It is the blueprint for resilient insurance, where technology anticipates chaos and delivers protection proactively. As these ecosystems mature, they set the stage to confront ethics and scale next.

Navigating Storm Clouds: Ethics, Risks, and the Road Ahead

Even as AI-insurtech ecosystems dazzle with promise, dark clouds gather. Algorithmic bias, data breaches, and regulatory gaps threaten to unravel the revolution. In 2026, 62 percent of insurers report ethics as their top AI concern, up from 45 percent in 2024 (PwC, 2026). This section confronts these storms head-on, charting bold fixes and a visionary path to resilient, fair systems that protect without prejudice.

Scalability snags bite hard. Blockchain platforms handle 10 million transactions daily but choke at peaks, delaying parametric payouts during disasters. Interoperability lags: only 40 percent of insurtech APIs align, stranding data silos (iSPIRT, 2026). Compute hunger devours budgets, with training costs up 35 percent amid power shortages in data centers.

Regulators push back. IRDAI's 2026 AI Framework demands annual bias audits and human overrides for high-stakes decisions, while the EU AI Act's "high-risk" label hits Indian exporters with compliance costs averaging \$5 million (European Commission, 2025). Global standards clash: Singapore's cyber mandates conflict with India's lighter touch, stalling cross-border bundles.

Solutions ignite excitement. Fairness audits using tools like AIF360 cut disparities 45 percent in Acko pilots, retraining models on synthetic diverse data. Federated learning shares insights across firms without raw data swaps, boosting thin-file accuracy 30 percent while honoring DPDP (IBM Research, 2026). Public sandboxes thrive: IRDAI's 2026 cohort tested 20 ethics-first ecosystems, approving 14 with zero-bias scores.

Privacy tech surges. Homomorphic encryption lets AI compute on encrypted micro-policy data, slashing breach risks 80 percent. Zero-knowledge proofs verify cyber hygiene without exposing details, as in Digit's 2026 ShieldPass, adopted

by 3 million users (Digit Insurance, 2026). Consent management platforms like OneTrust embed granular controls in apps, lifting user trust 22 percent.

Scalability breakthroughs loom. Edge AI processes underwriting on phones, cutting cloud reliance 60 percent for rural users. Quantum-resistant blockchain from Polygon secures 2026 pilots, handling 50,000 transactions per second. Open APIs via India's Insurance Stack unify 80 percent of players, per NITI Aayog benchmarks.

Conclusion: Igniting the Revolution

The journey through AI-driven insurtech reveals a seismic shift. From underwriting powerhouses predicting risks with laser precision to cyber fortresses repelling digital invaders and micro-insurance blitzes blanketing millions, the triple-threat convergence builds resilient ecosystems. In 2026, India's insurtech market surges past \$5 billion, with 200 million new users joining digital platforms, a 300 percent leap since 2023 (NASSCOM, 2026). Paytm's bundle alone shields

10 million MSMEs, while Acko's FarmShield stabilizes rural economies post-disaster. These are not pilots. They are proof of a revolution igniting equitable protection for the vulnerable.

Yet ethics and risks temper the fire. Biases excluding 28 percent of gig workers demand audits that cut disparities 45 percent. Privacy breaches like PlumHQ's 2025 leak of 15 million records call for encryption slashing risks 80 percent. Scalability hurdles yield to edge AI and open APIs unifying 80 percent of platforms.

The revolution burns bright. Picture Priya the farmer, once exposed, now thriving under AI alerts, cyber shields, and instant payouts. Her story multiplies across slums, farms, and gig fleets. By 2030, 60 percent of India's \$250 billion market runs on these systems, forging unbreakable shields in a hyper-connected world. Ethical AI turns peril into promise. Convergence crafts resilience.

Do not watch from sidelines. Build, regulate, innovate. Ignite the insurtech revolution today. Billions await protection. Lead the charge.



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Gig Economy and Insurance Protection: Rethinking Social Security for Platform Workers



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Abstract

India's gig and platform economy has grown rapidly, offering flexible income but exposing workers to major economic and social risks. Characterized by short-term, algorithmically managed tasks and independent contractor status, platform work falls largely outside traditional employer-employee frameworks that underpin conventional social security and insurance systems.

This study assesses the adequacy of insurance-based social security for gig and platform workers in India through secondary research, drawing on government reports (e.g., NITI Aayog), ILO publications, peer-reviewed literature, and policy documents. Descriptive and comparative analyses evaluate workforce growth, existing insurance provisions, and occupational vulnerabilities. Findings indicate fragmented, uneven, and narrowly focused coverage—primarily accident-related—despite projected workforce

expansion to 23.5 million by 2029–30. Health risks and income volatility remain inadequately addressed. The study concludes that effective protection requires integrated, statutorily enforced frameworks, innovative insurance products, aggregator contributions, and coordinated institutional mechanisms to promote worker welfare and sustainable platform-based employment.

Keywords

Gig Economy, Platform Work, Insurance-Based Social Security, Labour Protection, India.

Introduction

Digital labour platforms have significantly transformed the organisation of work by facilitating short-term, task-based employment mediated through digital technologies. In India, platform-based work has expanded rapidly across sectors such as ride-hailing, food delivery, logistics, domestic services, and professional freelancing, driven by increased smartphone penetration,

digital payment systems, and urban demand for on-demand services. While platform work offers flexibility and income-generation opportunities, it simultaneously weakens conventional employer-employee relationships that historically underpinned access to social security and insurance-based protection (Wood et al., 2019; NITI Aayog, 2022).

Gig and platform workers are typically excluded from employer-sponsored benefits, including health insurance, employment injury compensation, pensions, and paid leave. Their vulnerability is further intensified by income volatility, algorithmic management practices, and exposure to occupational risks, particularly in transport and delivery services. The COVID-19 pandemic starkly revealed these structural weaknesses, as large numbers of platform workers experienced abrupt income losses in the absence of adequate social protection or insurance coverage (International Labour Organization [ILO], 2021).

A central concern in this context is the legal classification of platform workers as independent contractors rather than employees. This classification allows digital platforms to limit statutory obligations related to welfare and insurance while exercising considerable control over work allocation, pricing, and performance evaluation through algorithmic systems. Scholars describe this arrangement as a “grey zone” of employment, wherein workers assume entrepreneurial risks without access to the protections traditionally associated with formal employment relationships (De Stefano, 2016; Wood et al., 2019).

From a social security perspective, insurance assumes particular importance in the gig economy because it offers a mechanism for risk pooling in the absence of stable and continuous employment. Empirical evidence from developing economies indicates that health shocks, accidents, and income interruptions are common among platform workers and that reliance on out-of-pocket expenditure for healthcare and income loss can push workers into financial distress, reinforcing cycles of economic precarity (ILO, 2021). Consequently, insurance-based interventions are increasingly recognised as essential complements to labour regulation in platform-mediated work arrangements.

In India, the relevance of insurance-led social protection is further amplified by the country’s historically high levels of informal employment and limited contributory social

security coverage. Prior to the enactment of the Code on Social Security, 2020, gig and platform workers were largely excluded from statutory insurance frameworks such as Employees’ State Insurance and Employees’ Provident Fund. Recent policy initiatives - including the legal recognition of gig workers under the Code and the creation of the e-Shram portal - signal a shift towards inclusion. However, persistent challenges related to implementation, insurance adequacy, worker awareness, and coordination among public institutions, insurers, and digital platforms raise important questions about the long-term sustainability and effectiveness of insurance-based social security for platform workers in India (NITI Aayog, 2022).

Literature Review, Objectives and Methodology

The growing body of literature on the gig and platform economy highlights its profound implications for labour markets, employment relations, and social security systems. Early studies conceptualised platform work as a flexible and technology-enabled form of labour that lowers entry barriers and expands employment opportunities (Berg et al., 2018). However, subsequent research has increasingly emphasised that this flexibility is accompanied by heightened economic insecurity, income volatility, and limited access to formal social protection mechanisms, particularly in developing economies characterised by large informal labour markets

(International Labour Organization [ILO], 2021).

A dominant theme in the literature concerns the employment classification of platform workers. Legal and labour scholars argue that the designation of gig workers as independent contractors enables platforms to avoid statutory obligations related to insurance, pensions, and employment injury benefits, despite exercising significant control over work allocation, pricing, and performance monitoring through algorithmic systems (De Stefano, 2016; Wood et al., 2019). This hybrid arrangement has been described as a “grey zone” of employment, wherein workers bear entrepreneurial and occupational risks without corresponding access to employer-sponsored social security. Comparative studies indicate that existing labour and social security laws, designed around standard employment relationships, are ill-equipped to address this emerging form of work (Cherry & Aloisi, 2017).

From a social protection perspective, international literature consistently identifies insurance as a critical but underdeveloped component of welfare provision for platform workers. The ILO (2021) notes that most gig workers remain outside contributory social security schemes and rely heavily on out-of-pocket expenditure to manage health shocks, accidents, and income disruptions. Empirical evidence suggests that voluntary or opt-in insurance schemes exhibit low enrolment and limited risk pooling, particularly among low-income platform workers

with irregular earnings (Berg et al., 2018). As a result, insurance gaps often translate into heightened financial vulnerability and long-term precarity.

The literature also critically examines platform-provided insurance arrangements. While many digital platforms offer group accident or life insurance coverage, these benefits are frequently limited in scope, conditional on active work hours, and lack transparency in terms of exclusions and claims processes. Scholars argue that such arrangements are often motivated by reputational risk management rather than comprehensive worker welfare, and they rarely ensure continuity or portability of coverage across platforms or employment spells (Cherry & Aloisi, 2017; Wood et al., 2019).

Indian scholarship and policy-oriented research add important contextual insights to this global debate. NITI Aayog (2022) provides one of the most comprehensive assessments of India's gig and platform workforce, estimating significant growth potential while simultaneously highlighting major deficits in social security and insurance coverage. The report underscores that the absence of predictable income and formal risk protection poses sustainability challenges for both workers and the broader labour market. Empirical studies on informal and urban workers in India further demonstrate that eligibility for insurance schemes does not necessarily translate into utilisation, due to low awareness, administrative complexity, and

perceived inadequacy of benefits (Karan et al., 2017).

Legal analyses of India's Code on Social Security, 2020, recognise it as a landmark intervention that formally acknowledges gig and platform workers as beneficiaries of social security. However, scholars point out that the Code adopts an enabling rather than mandatory approach, leaving critical issues - such as contribution mechanisms, benefit adequacy, and enforcement - to subordinate legislation and state-level implementation (Srivastava, 2021). Consequently, the actual insurance coverage of platform workers remains fragmented and uneven across regions.

Recent media investigations and civil society reports further document the occupational risks faced by platform workers in India, including road accidents, workplace violence, and health hazards arising from long working hours and performance-based incentives. These studies reinforce the argument that insurance-based social security must be aligned with the real risk profile of platform work and supported by efficient claims settlement and grievance redressal mechanisms (ILO, 2021; NITI Aayog, 2022).

Overall, the literature indicates a clear disconnect between the rapid expansion of platform-based employment and the evolution of insurance and social security systems. While legal recognition and policy intent have improved in recent years, existing insurance models - public, private, and

platform-led - remain insufficiently integrated to provide comprehensive and sustainable protection. This underscores the need for an insurance-centric framework that combines statutory backing, innovative product design, and shared responsibility among the state, insurers, and digital platforms.

While existing studies on the gig and platform economy predominantly examine the phenomenon from labour market or legal perspectives, limited research integrates workforce data, policy provisions, and insurance mechanisms to assess actual social protection outcomes. Addressing this gap, the present study examines the scale and growth of platform-based work in India, analyses the nature and adequacy of insurance-led social security provisions available to platform workers, and identifies critical gaps in coverage and implementation to propose policy-oriented measures for strengthening insurance-based social protection in the Indian gig economy. The study adopts a secondary-data-based methodology, drawing on government publications, reports of international organisations, peer-reviewed academic journals, and reputable media sources, and employs descriptive and comparative analytical techniques to assess emerging patterns and policy effectiveness.

Data Analysis and Interpretation

This section analyses secondary data on the scale of platform work in India, patterns of insurance coverage,

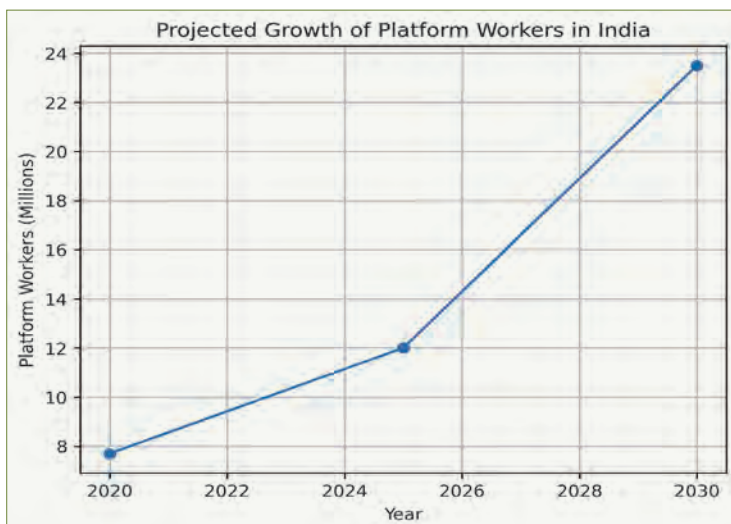
occupational risk exposure, and the effectiveness of existing insurance models. The analysis draws upon policy reports, international labour studies, and published empirical evidence to interpret the extent to which insurance mechanisms contribute to social security for platform workers.

Scale and Growth of Platform Work in India: Table & Figure-1 depicts the secondary data indicate that platform-based employment constitutes a rapidly expanding segment of India's labour market. Policy estimates suggest that the number of gig and platform workers stood at approximately 7.7 million in 2020-21 and is projected to rise to nearly 23.5 million by 2029-30, reflecting a shift towards digitally mediated service delivery in urban and semi-urban areas (NITI Aayog, 2022).

Table 1: Growth of Platform Work in India

Indicator	Value	Source
Platform workers (2020–21)	7.7 million	NITI Aayog (2022)
Projected platform workers (2029–30)	23.5 million	NITI Aayog (2022)
Key sectors	Transport, delivery, logistics, home services	Policy reports

Figure 1: Projected growth of platform workers in India (Source: NITI Aayog, 2022).



The projected tripling of platform employment highlights the urgency of designing insurance systems that are scalable and adaptable. In the absence of commensurate

expansion in social protection, growth in platform work risks reinforcing labour market precarity rather than promoting inclusive employment.

Registration and Worker Visibility:

The creation of a national worker database through the e-Shram portal represents a significant institutional intervention. However, available data indicate a wide gap between estimated platform workforce size and actual registration of gig and platform workers. While millions of unorganised workers have registered overall, platform workers constitute a relatively small proportion of total registrants.

Low registration rates limit the effectiveness of insurance-based interventions because most public schemes rely on administrative identification for enrolment. This gap suggests that registration has not yet translated into perceived or actual insurance benefits for platform workers.

Insurance Coverage Patterns:

Existing evidence indicates that insurance coverage for platform workers is fragmented across public schemes, private products, and platform-led arrangements. Public health insurance schemes provide theoretical eligibility but exhibit low utilisation among platform workers due to documentation requirements and limited awareness. Private

Table 2: Estimated Platform Workers vs Registered Workers

Parameter	Magnitude	Source
Estimated platform workforce	7.7 million	NITI Aayog
Registered gig/platform workers	< 1 million	Government releases

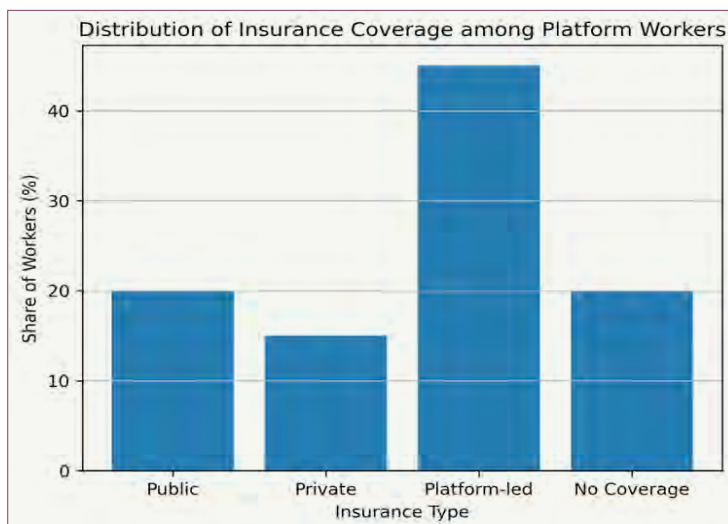
insurance products are available but often unaffordable for workers with irregular incomes.

Platform-led group insurance policies dominate in practice, typically focusing on accident or life coverage during active work periods.

Table 3: Insurance Coverage Patterns among Platform Workers

Insurance Model	Coverage Features	Limitations
Public insurance	Subsidised health and accident cover	Low awareness; implementation gaps
Private insurance	Individual or group policies	Affordability; continuity issues
Platform-led insurance	Group accident/life cover	Non-portable; limited scope

Figure 2: Distribution of Insurance Coverage by Type



The predominance of accident-focused insurance reflects a narrow understanding of worker risk.

Routine health expenses and income loss-major sources of financial distress-remain largely uninsured.

Occupational Risk and Claims

Experience: Platform workers, particularly in transport and delivery services, face elevated occupational risks. International labour studies

document higher exposure to road accidents, long working hours, and work-related stress among delivery and ride-hailing workers (International

Labour Organization, 2021). Media-based studies further highlight delays and disputes in insurance claim settlement under platform-provided policies.

Insurance effectiveness depends not only on coverage availability but also on claim accessibility and settlement efficiency. Opaque policy terms and weak grievance redressal mechanisms reduce worker trust in insurance arrangements.

Findings and Conclusions

The findings of the present study contribute to the emerging discourse on platform-based employment and insurance-led social security in India by systematically linking workforce growth, insurance coverage patterns, and policy outcomes. In relation to the first objective, the analysis confirms that platform work has assumed significant scale within India's labour market. Secondary estimates indicate that the number of gig and platform workers increased from approximately 7.7 million in 2020-21 and is projected to reach nearly 23.5 million by 2029-30. This projected expansion, documented by NITI Aayog (2022), reflects broader structural shifts associated with digitalisation, service-sector expansion, and the persistence of informal employment. The magnitude

Table 4: Key Occupational Risks and Insurance Gaps

Risk Type	Nature of Risk	Insurance Gap
Road accidents	High frequency injuries	Limited compensation
Health risks	Fatigue, chronic illness	Minimal health coverage
Income loss	Work disruption due to illness	No income protection

of this growth has important implications for social security systems that were historically designed around stable, employer–employee relationships.

With reference to the second objective, the study finds that insurance-based social security provisions for platform workers remain limited in coverage, fragmented in design, and uneven in implementation. Although recent policy initiatives have extended formal recognition and theoretical eligibility under public insurance schemes, effective access remains constrained by low levels of worker registration, limited administrative integration, and inadequate awareness. The data further indicate that existing insurance arrangements are predominantly oriented towards accident-related contingencies, with coverage largely restricted to fatal or permanent disability events. By contrast, routine health expenditures, temporary income loss, and rehabilitation needs—risks that constitute a substantial share of the vulnerability experienced by platform workers—remain insufficiently covered. This imbalance suggests a structural misalignment between prevailing insurance product design and the actual risk profile associated with platform-based work.

The analysis also highlights the dominant role of platform-led insurance arrangements in the current protection landscape. While such arrangements have contributed to the expansion of basic accident coverage, they are typically conditional on active

engagement with a specific platform and lack portability across platforms or employment spells. Given the prevalence of multi-platform engagement and episodic work patterns among gig workers, these limitations significantly reduce the continuity and effectiveness of insurance protection. Private insurance products, although potentially more comprehensive, remain largely inaccessible to many platform workers due to affordability constraints and irregular income flows. These findings are consistent with international evidence indicating low insurance penetration and weak risk pooling among platform workers, particularly in developing economies (International Labour Organization, 2021).

In addressing the third objective, the study identifies persistent gaps between occupational risk exposure and insurance protection. Platform workers, especially those engaged in transport and delivery services, face elevated risks related to road accidents, work-induced health deterioration, and income disruption arising from illness or injury. However, the analysis indicates that existing insurance mechanisms provide limited support in terms of medical reimbursement, income replacement, or timely claims settlement. Furthermore, secondary evidence points to deficiencies in transparency, grievance redressal, and claims management processes, which collectively undermine worker confidence in insurance arrangements and constrain their effectiveness as instruments of social protection.

Taken together, the findings reveal a substantial divergence between the rapid expansion of platform-based employment and the development of insurance-led social security mechanisms. While legislative recognition under the Code on Social Security, 2020 represents an important institutional advancement, the absence of clearly articulated contribution frameworks, limited coordination between public authorities and insurers, and reliance on discretionary platform-led arrangements continue to restrict meaningful protection outcomes.

In conclusion, the study finds that insurance protection for platform workers in India remains inadequate in terms of scope, continuity, and institutional enforceability. Legal recognition, while a necessary precondition, is insufficient to ensure effective social security outcomes. From an insurance and policy perspective, the growth of platform work necessitates a re-examination of conventional social security and insurance frameworks to accommodate non-standard employment relationships. The findings underscore the need for integrated, insurance-led social protection arrangements that combine statutory backing, appropriate risk coverage, and effective administrative mechanisms. Strengthening insurance provision for platform workers is therefore central not only to improving worker welfare but also to ensuring the long-term sustainability and credibility of the platform economy within India's evolving labour market.

Policy Implications and Future Research Directions

The findings underscore the need for a more coherent and institutionally grounded approach to insurance-led social security for platform workers in India. From a policy standpoint, there is a clear requirement to establish transparent and enforceable contribution frameworks that define the roles of digital platforms, the state, and workers in financing insurance coverage. Insurance products should be redesigned to

ensure portability, continuity, and adequate coverage of health risks and income loss, moving beyond the current emphasis on accident-related benefits. Strengthening administrative integration between worker registration systems and insurance providers, along with mandating transparent claims settlement and effective grievance redressal mechanisms, is essential to enhance coverage effectiveness and worker trust.

From a research perspective, future studies should prioritise empirical

evaluation of insurance utilisation, claims settlement experiences, and worker outcomes across different platform sectors. Longitudinal analyses examining the impact of insurance coverage on income stability and health outcomes, as well as comparative assessments of emerging hybrid insurance models and state-level implementation variations, would provide valuable evidence to inform policy refinement and the design of sustainable social security frameworks for platform workers. 

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Divorce Insurance in India: Opportunities, Risks, and Regulatory Challenges



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Scenario: *Atul, a talented software engineer from Bihar, entered into marriage with hope and optimism. He married Nikita, believing they would build a happy life together, one based on trust and companionship. Atul hoped for emotional security with financial progress for a better life. However, what happened was from imagination. Gradually, marriage became the source of emotional distress, legal pressure and financial pain. Courtrooms snatched the comfort of his life; anxiety replaced the peace, and the weight of continuous legal conflict became unbearable. Eventually Atul could not take this burden anymore and took his own life. Like Atul there are multiple precious lives we are losing due to wrong marriages.*

The divorce rate in India used to be very low compared to other Western nations. As per the 2011 Census, only 0.24% of the married population were divorced. However, recently, as per general observation and recorded by different reports, Divorce rates in India are consistently rising, especially in the urban cities. There are multiple reasons for this, like interference from the family, increasing financial independence of women and education. And many individuals take the wrong path if they are unable to bear the expenses and the loss associated with divorce. The right financial move in such a situation is to get a divorce insurance policy.

Divorce Insurance can play a significant role in taking care of all the divorce-related expenses. This

insurance option must be purchased at the time of marriage to reduce the effect of any monetary losses brought on by abrupt or unforeseen events. Premium must be calculated based on the couple's joint income as well as the individual's earning potential. There must be a waiting period in the policy of two to three years following the proceeding.

Increasing Divorce Rate in India

Divorce is the dissolution of a marriage, basically a process of ending the relationship between husband and wife. Western countries like the US, UK, Canada and France have a high frequency of divorces. Though the divorce rate in India is low, it is quickly changing.

Approximately 13 Lakh divorces were recorded in India in the 2011 Census. Today, this number is shockingly higher. According to the NCRB report, *Accidental Deaths and Suicides in India*, marital problems have driven about 37,591 people to suicide between 2016 and 2020 — an average of about 20 people daily.

There are many reasons for the rise in divorce cases in India-

Rising Financial Independence and Education:

Previously, most women were uneducated and unable to find suitable employment. For finances, the wife had to rely on their husband. Even if her husband abuses her, Shasha has no choice but endure the suffering. Today, women are no longer dependent on their husbands for necessities; they are achieving financial independence by working.

Acceptance of Divorce:

Due to social pressure, divorce was frowned upon. A divorced woman was seen as low in society and was unable to return to her parents' house. Now that the acceptance of divorcees in society is gradually rising, this view is shifting. Women are supported in ending the marriage if they experienced distress or torture in the marriage.

Extra Marital Affairs and Cheating

Cases: The rising fidelity cases are also resulting in divorces. As per 2025 data from Ashley Madison, a global dating app known for connecting people seeking extra-marital relationships, Kanchipuram (a town in Tamil Nadu) has topped the list of Indian districts with the most affairs.

Sham Wedding: These are planned marriages to achieve the sole aim of financial gain. These marriages consistently end in divorce.

Other Reasons: Cruelty, demand for dowry, suicide threats and drug abuse are other crucial reasons for divorce.

Importance of Divorce Insurance

Divorce negatively impacts the couple's joint finances. An individual is unable to bear the divorce-related expenses, and remember, the person is going through emotional pain of separation as well, so the person has to face a double burden.

Safety Net: Divorce insurance would work as a safety net in the event of the worst in a marriage. Divorce insurance would help in covering the legal and professional fees. The insurance company will pay for lawyers, mediators, and therapists, which can be very expensive for an individual.

Protection Against Alimony: Divorce insurance can protect against the exorbitant alimony. An insurance policy will help in covering the ongoing payments or help the spouse manage the legal obligation.

Financial Independence: Divorce insurance will help individuals become financially independent

without going through major disruption during the emotional pain of divorce.

Unforeseen Expenses: Divorce insurance will help in managing the unexpected expenses. It will help in managing unforeseen financial burdens during the disruptive time of an individual.

History of Divorce Insurance

In 2010, a North Carolina-based insurance start-up, SafeGuard Guaranty Corporation, launched the first divorce insurance product called WedLock.

Each unit of this product costs \$16 a month and provides a \$1250 coverage to cover expenses like legal proceeding costs. A person can buy multiple units in a year, and on every successful renewal, SafeGuard will provide another \$250 of coverage for each unit a person owns.

To prevent the moral hazard or to prevent spouses from getting a divorce to make money, SafeGuard requires a waiting period of 3 years from the policy start before any claim can be made.

As of now, there is no specific "divorce insurance" product currently being offered by Indian Insurance companies.

Divorce Insurance Product Coverage

Legal Expenses: Policy will provide coverage for the legal expenses, such as lawyer fees, court filings, mediation and documentation costs, which form a large financial burden during divorce proceedings.

Division of Jointly Owned Assets: Policy will cover legal expenses

incurred for dividing the jointly owned assets.

Child Support or Alimony: Divorce insurance will provide temporary financial assistance to manage obligations related to child support or alimony.

Mental Health Support: Marriage separation mentally impacts the person. Coverage will include counselling and mental health support to help individuals recover from emotional distress.

Living Expenses: Divorce insurance can help in addressing income shock as households have to shift from a dual income to a single income by supporting living expenses.

Divorce Insurance Product Framework

Legal Expenses: The divorce insurance product is mainly designed to help individuals in managing the legal expenses incurred during court proceedings.

Claims Payout: Once the divorce is legally finalized, the insurer will pay a lump-sum amount equal to three times the annual premium to meet legal expenses.

Refund of Premium: If the policyholder has paid premiums continuously for two years and the divorce occurs within two years of policy purchase, then the premiums paid will be returned to the policyholder.

ULIP Plan: Product can be linked to goal-based ULIP plans for children, like for savings for education or marriage, helping to meet long-term financial goals.

Renewal: policy must be renewed every year to ensure the continuation

of coverage and accumulated benefits.

Potential Market for Divorce Insurance in India

Rising Divorce Awareness: In past, divorce rates were very low in India, divorce cases are rising very rapidly. With urbanization, changing social norms, increasing women's education, and more awareness of legal rights, divorce cases have increased.

High Financial Cost of Divorce:

Divorce cases create a large financial burden on the individual. Legal fees, alimony, and child support are creating demand for divorce insurance.

Mental Health and Emotional Stress Awareness:

One goes through emotional distress during the divorce process. During this time, a distressed person needs counselling to recover from this pain. This creates the need for divorce insurance.

Limited Social Security Protection:

India does not have any social security for individuals facing financial distress due to divorce, creating a gap for divorce insurance.

Challenges for Divorce Insurance in India

Cultural and Social Stigma: Marriage is considered a sacred and lifelong

institution in India. Hence, initiating the discussion around divorce insurance may face social resistance.

Risk of Moral Hazard: There is valid concern that individuals may intentionally misuse this product for cash winnings or treat divorce as a financial opportunity rather than a last resort.

Difficulty in Risk Pricing and Underwriting:

Actuaries would face a challenge while pricing this product, as there is an unavailability of historical data on divorce trends, costs and duration.

Legal Uncertainty: In India, divorce is still not recognized as an insurance event. It creates a challenge for insurance companies to ideate and launch such a product.

Low Awareness: People may not initially understand this niche insurance product. Insurers will have to incur heavy expenses for the promotion of this product.

Suggestions to Build Divorce Insurance in India

Clear Regulatory Framework and Pilot Programs:

Insurers need to work closely with IRDAI to introduce a divorce insurance product in the country. Initially, this product should be launched as a pilot or an add-on product.

Anti-Misuse Controls: the product must have a longer waiting period, renewal-based benefits and strict documentation to prevent any kind of moral hazard or opportunistic claims.

Data-Driven Pricing: Insurers should start with urban, salaried and private-sector segments to build data and refine the actuarial model over time.

Awareness: Divorce insurance must be promoted among urban salaried employees by the employers as a financial protection against marital distress.

Conclusion

Women are no longer dependent on their husbands for finances, they are aware of their legal rights, well educated, doing well-paid jobs in corporates and are not ready to suffer any distress in marriage silently. This is leading to a rise in divorce cases in India. Divorce creates immense emotional and financial distress for the individual. Financial stress can lessen through divorce insurance. There is a potential market in India for such a product due to rising divorce awareness. However, there is no such product currently available in the country. Insurers need to come together and brainstorm this product and design it as per the Indian market. The regulator must look at all the pros and cons of this product before giving a green signal. 

Bookmarks

<https://www.russellalexander.com/divorce-information-centre/general-concepts/is-divorce-insurance-a-reality/>

<https://paulhbowenlaw.com/divorce-insurance-coverage-how-does-it-work-what-are-the-benefits/>

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Performance of PMFBY in Karnataka – An Analysis



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Abstract

The primary objective of the present study is to evaluate the performance of the Pradhan Mantri Fasal Bima Yojana in Karnataka. The current study is descriptive and analytical in nature. The researcher employed Standard deviation, mean, coefficient of variance, and growth rate to evaluate the effectiveness of PMFBM. The researcher used parameters like the number of farmers enrolled, the disbursement of claims, the number of farmers benefited, and the beneficiary ratio.

The research reveals that PMFBY enrollment reveals fluctuating trends in both the Kharif and Rabi seasons. While Kharif shows overall growth with notable variations, Rabi experiences erratic patterns and declines. We recommend targeted outreach to address these fluctuations. Inconsistent insured area trends, particularly in Rabi, highlight the need for stabilization measures. Variability in claims disbursement and farmer benefits underscores the necessity for policy adjustments.

Keywords

Insurance, Premium, Farmers, Crop Insurance, Kharif, and Rabi.

Introduction

A risk management technique that helps shield farmers from monetary losses is crop insurance. It combines the risks of numerous farmers into one, allowing the others to assist in covering losses sustained by one. This eliminates the risk and minimizes the cost for everybody involved. A legally binding contract known as crop insurance is a commitment made by the insured to pay the insurer a fixed amount in the event of unfavorable or catastrophic circumstances in the farming land.

This study makes use of secondary data and statistical techniques like growth rate, mean, and coefficient of variation. The objective of the present research is to evaluate the performance and functioning of the Indian Crop Insurance PMFBY in Karnataka.

The present study has been organized in the following order: Introduction, Genesis of Crop Insurance, Research Gap, Research Objective, Research Methodology, Scope of the study, Analysis and Interpretation of Data, Findings and Suggestions of the study, and followed by Concluding Remarks and References.

The Genesis of Crop Insurance in India

Crop insurance in India originated in the early 20th century, with the first initiatives taken by individual states to provide relief to farmers affected by natural disasters such as droughts and floods. However, the modern formalization of crop insurance in India began in the 1970s and gained momentum in subsequent decades.

The history of crop insurance in India can be traced back to the formation of the Agriculture Insurance Company of India Limited (AIC) in 1972. AIC was established as a specialized insurance company to provide crop insurance coverage to farmers across

the country. Initially, the focus was on providing insurance against yield losses caused by natural calamities such as drought, flood, and cyclone.

In the 1980s, the Indian government launched various pilot schemes to test different models of crop insurance and assess their effectiveness in providing financial protection to farmers. These pilot schemes laid the foundation for the development of a comprehensive crop insurance program in the country.

One of the significant milestones in the evolution of crop insurance in India was the introduction of the Comprehensive Crop Insurance Scheme (CCIS) in 1985. Under this scheme, farmers were provided with insurance coverage against yield losses due to natural calamities and other specified risks.

Over the years, the Indian government has continued to refine and expand crop insurance coverage to make it more comprehensive and accessible to farmers. The establishment of the Agricultural Insurance Corporation of India (AICI) in 2002 further strengthened the country's institutional framework for crop insurance.

In 2016, the Indian government introduced the Pradhan Mantri Fasal Bima Yojana (PMFBY), a scheme designed to offer comprehensive crop insurance coverage to farmers at affordable premiums. PMFBY integrated various existing crop insurance schemes and introduced several reforms to enhance efficiency, transparency, and accountability in the crop insurance process.

Today, crop insurance remains a critical tool for managing agricultural risks and supporting the livelihoods of millions of farmers in India. The government continues to invest in crop insurance programs and to explore innovative solutions to address the evolving challenges facing the agricultural sector.

Research Gap

In keeping with the aforementioned, a few more scholars have focused on various facets of crop insurance. However, no researcher has tried to appraise the PMFBY in Karnataka by taking into account agriculturalists' enrollment, the number of farmers who benefited, the disbursement of claims, and the beneficiary ratio. So, the current investigation has been undertaken to bridge this research gap as much as possible.

Research Objective

The objective of the present research is to evaluate the performance and functioning of the Indian Crop Insurance, Pradhan Mantri Fasal Bima Yojana, in Karnataka.

Research Methodology

Measuring the effectiveness of PMFBY in Karnataka is the major goal of the research study, which is descriptive and analytical in nature. Secondary data has been gathered for the years 2017–2023 from AIC websites, annual reports, and handbooks to assess PMFBY's performance. The researcher computed the mean, growth rate, coefficient of variation, and Standard deviation (SD) to describe the gathered secondary data.

Scope of the Study

The required statistics have been collected over 7 years from the AIC website, and only one Indian crop insurance scheme, i.e., Pradhan Mantri Fasal Bima Yojana, has been considered for the present research. The geographical scope of the present research is limited to Karnataka only.

Analysis and Interpretation of Data

The researcher evaluated the performance of PMFBY in Karnataka with the help of seven parameters, namely, the number of farmers enrolled, area insured, sum insured, premium collected, disbursement of claim, number of farmers benefited, and farmers' beneficiary ratio.

(1) Number of Farmers enrolled

Farmers' enrollment in PMFBY reflects scheme accessibility, trust, financial protection, and government commitment. Monitoring enrollment trends assesses implementation effectiveness and inclusivity, indicating outreach success and awareness among farmers. Higher enrollment signifies confidence in risk mitigation, showcasing the scheme's ability to provide financial support during crop loss. Additionally, analyzing demographic distribution indicates inclusivity, reaching marginalized farming communities. Overall, the number of farmers enrolled serves as a comprehensive gauge of PMFBY's performance, covering accessibility, effectiveness, financial protection, government spending, implementation, and inclusivity.

Table 1: Number of Farmers Enrolled in PMFBY

Year	Kharif	Growth Rate (%)	Rabi	Growth Rate (%)
2017	250043	-	795716	-
2018	412041	64.78806	158937	-80.0259
2019	177280	-56.9752	177354	11.58761
2020	236081	33.16843	15428	-91.301
2021	280062	18.62962	58847	281.4299
2022	525874	87.77057	95473	62.23937
2023	479856	- 8.75077	76941	-19.4107
Few Descriptive Statistics				
SD	134294.6016		269898.7868	
Mean	337319.5714		196956.5714	
CV	39.8123		137.0347	

Source: The Researcher Compiled the Data from AIC

Table 1 presents data on the number of farmers enrolled in the Pradhan Mantri Fasal Bima Yojana (PMFBY) for both the Kharif and Rabi seasons from 2017 to 2023, along with the corresponding growth rates.

The Kharif season recorded fluctuating but comparatively stable enrollment trends. Enrollment increased significantly in 2018 (64.79%), declined in 2019 (-56.98%), and then showed continuous improvement through 2022, with the highest growth rate of 87.77%. This indicates increasing awareness and participation of farmers in crop insurance during the Kharif season. However, a slight decline was observed in 2023. In contrast, the Rabi season exhibited highly erratic enrollment patterns. Enrollment declined sharply in 2018 (-80.03%) and 2020 (-91.30%), while there was an exceptional increase in 2021 (281.43%). These fluctuations

may be due to irregular rainfall, lower irrigation facilities, and inconsistent farmer participation. The descriptive statistics reveal that the Kharif season had higher average enrollment and lower variability, whereas the Rabi season showed greater instability with a high coefficient of variation (137.03%), indicating inconsistent enrollment trends.

(2) Disbursements of Claim

Disbursement of claims in PMFBY is vital for performance measurement. It signifies efficient claim settlement, ensuring prompt compensation for farmers during crop loss, and enhancing financial stability. Effective disbursement builds trust, encouraging farmer participation and scheme endorsement. It boosts PMFBY's credibility, showcasing its ability to deliver financial protection against crop losses. Monitoring claim disbursement assesses the impact on farmers' livelihoods and resilience, potentially stabilizing income. Timely disbursement reflects the government's commitment to support farmers and mitigate risks, highlighting effective policy implementation. Overall, it's a critical measure of PMFBY's efficiency, trust, credibility, impact, and government dedication to agricultural welfare.

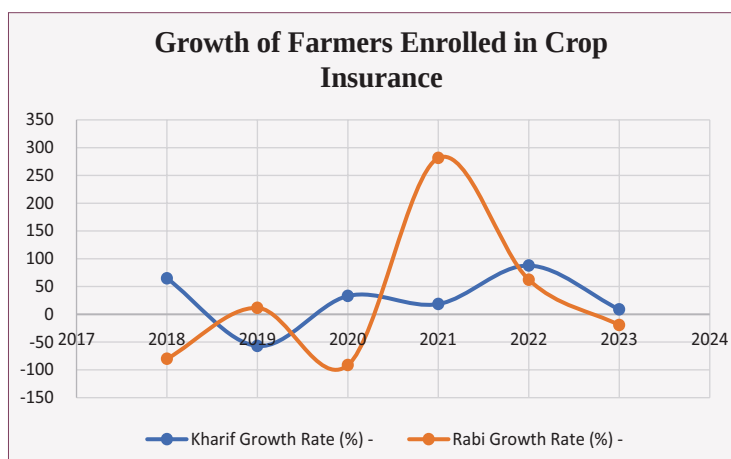


Figure 1: Growth of farmers' enrollment in Karnataka

Table 2: Disbursement of Claim under PMFBY (in Lakh)

Year	Kharif	Growth Rate (%)	Rabi	Growth Rate (%)
2017	27438	-	52590	-
2018	45619	66.2621	27377	-47.9426
2019	29051	-36.3182	15278	-44.194
2020	19130	-34.1503	648	-95.7586
2021	22470	17.4595	2098	223.7654
2022	57231	154.6996	9050	331.3632
Few Descriptive Statistics				
SD	14796.8182		19625.087	
Mean	33489.8333		17840.167	
CV	44.1830		110.0051	

Source: The Researcher Compiled the Data from AIC

Table 5 provides data on the disbursement of claims under the Pradhan Mantri Fasal Bima Yojana (PMFBY) for both the Kharif and Rabi seasons from 2017 to 2022, along with the corresponding growth rates.

In the Kharif season, there is considerable variability in the

disbursement of claims, with fluctuations observed over the years. Notably, there is a significant increase in claims disbursement from 2017 to 2018 (66.26%), followed by a sharp decline in 2019 (-36.32%). Subsequently, from 2020 onwards, there is a general downward trend in Kharif season claims disbursement,

although there is a notable spike in 2021 (17.46%). Conversely, claims disbursement in the Rabi season displays more erratic patterns, with considerable fluctuations observed. The highest growth rates in Rabi season claims disbursement occur in 2021 (223.77%) and 2022 (331.36%), indicating sudden surges. However, these trends were not sustained in the following years, with negative growth rates observed in 2019 and 2020. The statistical summary indicates high variability in claims disbursement numbers, particularly in the Rabi season.

(3) Number of Farmers Benefited

The number of farmers benefiting from PMFBY is crucial for evaluating its performance. It signifies outreach and inclusivity, reflecting effectiveness in providing financial protection to a wider farming community. Additionally, beneficiary numbers indicate the extent of risk coverage, contributing to farmers' resilience. Monitoring beneficiaries helps gauge financial impact, enhancing farmers' stability. Increasing trends highlight growing trust and scheme utilization. Lastly, beneficiary figures demonstrate government commitment to agriculture and risk mitigation, reflecting resource allocation and policy implementation. Overall, it's a critical measure of PMFBY's performance, encompassing outreach, risk coverage, financial impact, scheme utilization, and government dedication to agricultural welfare

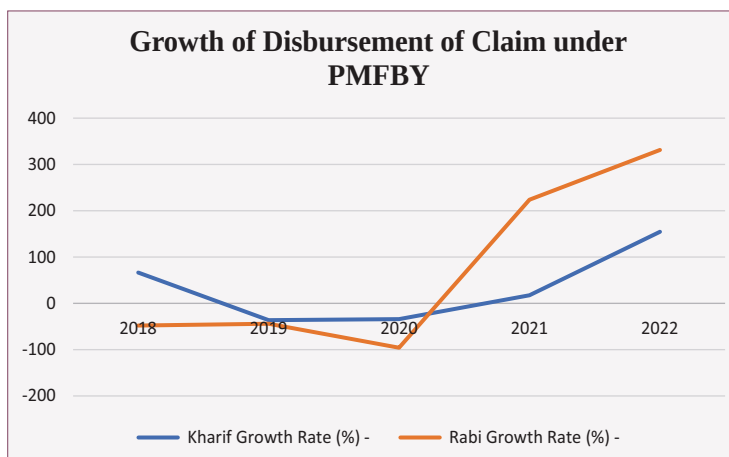


Figure 2: Growth of disbursement of claims under PMFBY in Karnataka

Table 3: Number of farmers benefited under PMFBY

Year	Kharif	Growth Rate (%)	Rabi	Growth Rate (%)
2017	184513	-	543853	-
2018	261474	41.71034	128157	-76.4354
2019	175595	-32.8442	104633	-18.3556
2020	112513	-35.9247	5070	-95.1545
2021	165782	47.34475	19544	285.4832
2022	466582	181.4431	33580	71.81744
Few Descriptive Statistics				
SD	126401.909		204217.949	
Mean	227743.167		139139.5	
CV	55.5020		146.7721	

Source: The Researcher Compiled the Data from AIC

Table 6 presents data on the number of farmers who benefited under the Pradhan Mantri Fasal Bima Yojana (PMFBY) for both the Kharif and Rabi seasons from 2017 to 2022, along with the corresponding growth rates.

In the Kharif season, there is substantial variability in the number of farmers who benefited, with fluctuations observed over the years. Notably, there is a significant increase in the number of benefited farmers from 2017 to 2018 (41.71%), followed by a sharp decline in 2019 (-32.84%). Subsequently, from 2020 onwards, there is a general downward trend in the Kharif season benefited farmers, although there is a notable increase in 2021 (47.34%). Conversely, the number of benefited farmers in the Rabi season displays more erratic patterns, with considerable fluctuations observed. The highest growth rates in the Rabi season benefited farmers in 2021

(285.48%) and 2022 (71.82%), indicating sudden surges. However, these trends were not sustained in the following years, with negative growth rates observed in 2018 and 2020. The statistical summary indicates high variability in the number of benefited farmers, particularly in the Rabi season.

(4) Beneficiary ratio

The beneficiary ratio of PMFBY is crucial for performance evaluation. It reflects efficient targeting, ensuring vulnerable farmers have access to benefits. A high ratio signifies inclusivity, reaching diverse socio-economic backgrounds. Moreover, it indicates effective risk mitigation by protecting more farmers against crop losses. Assessing the financial impact on farmers enhances stability. Increasing beneficiary trends indicate growing trust and scheme utilization. Furthermore, a high ratio demonstrates government commitment to agriculture, allocating resources for farmer welfare. Overall, it's a critical measure encompassing targeting, inclusivity, risk mitigation, financial impact, utilization, and government dedication to agricultural welfare.

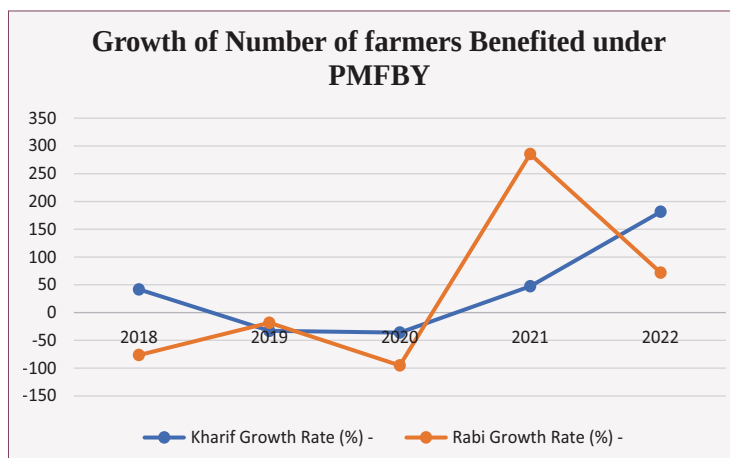


Figure 3: Growth of the Number of farmers who benefited under PMFBY in Karnataka

Table 4: Farmers Beneficiary ratio under PMFBY

Year	Kharif Season			Rabi Season		
	No. of Farmers Benefited	No. of Farmers Enrolled	Beneficiary Ratio	No. of Farmers Benefited	No. of Farmers Enrolled	Beneficiary Ratio
2017	184513	250043	73.79	543853	795716	68.35
2018	261474	412041	63.46	128157	158937	80.63
2019	175595	177280	99.05	104633	177354	59.00
2020	112513	236081	47.66	5070	15428	32.86
2021	165782	280062	59.19	19544	58847	33.21
2022	466582	525874	88.73	33580	95473	35.17

Source: The Researcher Compiled the Data from AIC

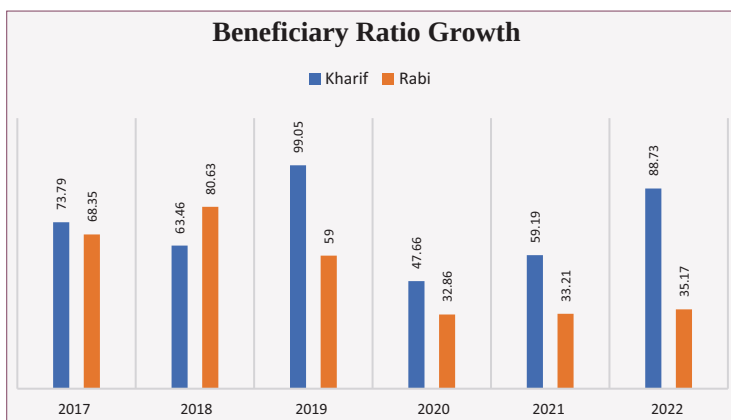


Figure 4: Growth of beneficiary ratio under PMFBY in Karnataka

Findings and Suggestions of the Study

The analysis of enrollment trends in the Pradhan Mantri Fasal Bima Yojana (PMFBY) for both Kharif and Rabi seasons revealed significant variability over the years. While Kharif season enrollment generally exhibited an increasing trend from 2017 to 2022, it was marked by notable fluctuations. Conversely, enrollment in the Rabi season displayed more erratic patterns, with noticeable declines in certain years. To address this variability, it is recommended to

explore the underlying reasons behind these fluctuations and implement targeted outreach programs to improve enrollment consistency. Additionally, the analysis of insured area trends showed fluctuations in both seasons, though the Kharif season demonstrated a more consistent increasing trend from 2020 onwards. On the other hand, the Rabi season witnessed high variability and occasional drastic declines in insured areas. Therefore, efforts should be made to investigate factors contributing to these fluctuations and implement measures to stabilize

insured area trends. Furthermore, the trends in sum insured, premium, claims disbursement, number of farmers benefited, and farmers beneficiary ratio all displayed varying degrees of variability and occasional surges, particularly in the Rabi season. To address these challenges, reviewing the factors influencing these trends and adjusting policy mechanisms accordingly is suggested. Additionally, evaluating processes for claims assessment and disbursement to ensure timely and equitable payouts is crucial. Enhanced outreach efforts are also recommended to ensure more consistent benefits for farmers across seasons and optimize the beneficiary ratio through targeted interventions to maximize the program's impact. Overall, continuous monitoring and adaptation of PMFBY policies and practices are essential to address fluctuations and ensure effective support for farmers in Karnataka.

Concluding Remarks

In conclusion, the performance analysis of the Pradhan Mantri Fasal Bima Yojana (PMFBY) in Karnataka reveals considerable fluctuations in enrollment, insured area, sum insured, premium collection, claims settlement, number of farmers benefited, and beneficiary ratio across both Kharif and Rabi seasons. The comparatively better performance during the Kharif season may be attributed to higher agricultural activity, greater awareness among farmers, dependency on monsoon cultivation, and stronger institutional support during the major cropping season. In contrast, the Rabi season

exhibited inconsistent enrollment and insured area trends due to factors such as irregular rainfall, limited irrigation facilities, lower awareness, reduced crop diversification, and delayed claim settlements, which may have discouraged farmer participation.

The study further indicates that variations in premiums and claims disbursement reflect regional climatic risks, crop losses, administrative inefficiencies, and delays in assessment and compensation processes. Although PMFBY has significantly contributed to providing financial protection and risk coverage to farmers, the uneven beneficiary ratio suggests disparities in access, awareness, and implementation effectiveness across districts and seasons.

To improve the effectiveness of the scheme, the government and implementing agencies should strengthen awareness campaigns, particularly in rural and drought-prone areas, through farmer education programs, village-level workshops, and digital outreach initiatives. Timely settlement of claims, transparent crop loss assessment, and the use of advanced technologies such as satellite imaging, remote sensing, and mobile-based reporting systems can enhance trust and participation among farmers. Further, policy measures should focus on region-specific crop insurance strategies, simplified enrollment procedures, increased coordination among banks, insurance companies, and agricultural departments, and improved accessibility for small and marginal farmers.

Continuous monitoring, periodic policy revisions, and data-driven evaluation of PMFBY are essential to ensure equitable coverage, reduce regional disparities, and strengthen the resilience and sustainability of Karnataka's agricultural sector. **TJ**

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Engaging Generation Z: Strategic Imperatives for Life Insurers in a Digital-First India



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Abstract

Generation Z is emerging as a dominant force in India's consumer market, defined by digital fluency, short attention spans, and demand

for instant, personalized experiences. As tech-savvy individuals who research extensively and influence family financial choices, Gen Z offers life insurers both major growth opportunities and significant

disruption. Traditional models based on long-term relationships and information asymmetry are losing relevance, as this cohort insists on transparency, seamless digital interfaces, value-focused

products (e.g., affordable term plans with wellness benefits), and rapid trust via reviews, social proof, and user-centric innovation. Trends reveal Gen Z's preference for term insurance to secure early financial protection, modular coverage, and intuitive platforms combining ease, affordability, and lifestyle relevance yet penetration remains low due to perceived complexity and life-stage misalignment. This paper examines current industry offerings, highlights key behavioral insights into Gen Z preferences, and proposes strategies that are in-sync with the changing times.

Keywords

Buyer; Cohort; Information; Information-asymmetries; Gen Z; Technology.

Introduction

Gen Z: A Significant Cohort for Life Insurers

Talking of demographic cohorts, different names have been given to groups of individuals having similar years of birth and by virtue of that they have been exposed to social, cultural, behavioural, economical, and emotional events when they were growing up. They then become a hot proposition for researchers and businesses alike because of the tectonic shifts seen in industries and patterns of buying whenever these cohorts have been relevant.

Since Gen Z is the topic of interest with regards to the current paper, it always pays to set the context where Gen Z has become quite a raging subject of interest with respect to

the marketers. That context has had a historical perspective wherein a natural progression through these cohorts has led to the current Gen Z grabbing all the eyeballs specifically in a personalized life-changing event like taking a life insurance policy. When name calling did become a norm, the first cohort was termed as **Silent Generation (born 1928-1945)**. They were the quintessential 'traditionalists' or the 'greatest generation' that grew up during the torrid times of the Great Depression and World War 2. They were idolised for virtues like hard work, loyalty, and respect for the law of the land.

The next in line cohort was the **Baby Boomers (born 1946-1964)**. At the time of their being, they had the recognition as the largest generation in history up until the Millennials overtook them in that aspect. Although not exposed to the harshest of time like their predecessors 'Silent Generation', they still were witness to extensive social change such as the civil rights movement, the invention and commercialisation of Television, and the Vietnam War. Since formal trade did take off in their span of existence, they got associated with values like materialism and individualism.

Third in the list was **Generation X (born 1965-1980)**. As industries grew and employment became available to many, Gen X, also known as the 'Latchkey Generation' was characterised by double income households. Further inroads made by technology that led to the development of personal computers and the internet found a perfect taker

in Gen X who were free-spirited and had the entrepreneurial spirit and were sceptical of any presiding authority; they rather preferred to be alone.

Next up, **Millennials (1981-1996)** came to be known as **Generation Y (Gen Y)**; they had been relevant all through the digital revolution that continued its unabated growth through their formative years and continues to this day. Characterised by intensive exposure to laptops, social media, smart phones, etc., Gen Y was the first of the cohorts that faced the challenge of 'work-life balance' at its peak.

When millennials were in their formative years, a cohort named **Generation Z (born 1997-2012) (Gen Z)** also known as '**Digital Natives**' came along and for them the smart phones and laptops were the extension of the world they were operating in unlike the millennials. Gen Z were born and brought up on technology and took it like a fish to water. Diversity, authenticity, and adaptability characterised them and customised offerings appealed to them greatly.

Generation Alpha (Gen Alpha) (2013- present), children of millennials, is still the next cohort in the making and it has the distinction of the being the first cohort to be born and raised exclusively in the 21st century.

So seeing the natural progression of cohorts across years and timelines and for the topic of our interest for this paper, Gen Z, it would be interesting to gauge the rise of this

cohort with regards to companies eyeing their share of wallet especially for a business as inherently 'personal' (from a selling point of view) as life insurance and at a time when technology-backed information in life insurance has found an organic taker in Gen Z.

As India navigates a digital era, the insurance industry stands at a critical juncture, especially with the rise of Generation Z. This demographic, which currently encompasses approximately 472 million individuals, or about 34% of India's total population (extraedge.com), is not just transforming market dynamics but also redefining consumer expectations. With India's insurance market poised to reach \$250 billion by 2025, understanding and engaging Gen Z, which holds a growing share of the consumer base, becomes paramount. They are estimated to form a major share of 50% of the Indian populace by 2030

(Economic Times, 2024). Here's how the industry can adapt, with updated statistics and strategic use cases.

Possibly due to Covid 19 and the after-effects of it, the world moved to a largely digitalized business landscape much sooner than it normally would have. What remains a big challenge with the rise of Gen Z as a demographic of strategic significance for India's life insurance industry is that they are expected to constitute half of India's population, along with Millennials, by 2030 (Economic Times, 2024). Currently constituting 23% of India's population – 52% combined with Millennials (NASSCOM Report, 2024) - their representation is not much in the life insurance space at present but with their rising representation in the workforce and with their propensity to consume digital offerings with consummate ease, their numbers are all set to rise in proportion of total sales of life insurance companies.

Another interesting finding thrown up by Transunion (Transunion Study, 2024) (figure 1 & 2 below) has interpretations that hold the key as to how this coveted segment is to be catered to by the life insurance companies. While figure 1 indicates the extent to which Gen Z is into credit, life insurance protection can be pitched in as a robust means to secure lives and assurance for the dependent family members, figure 2 indicates how matched-up are Gen Z with their millennial (Gen Y) counterparts in most aspects of online shopping inspite of a larger age gap. With loan payments looming large, it would be imperative on part of life insurance companies to pitch in variety of products including but not limited to, term plans and retirement plans since most of Gen Z have just started a career or are on the cusp of doing so. Similarly, incorporating the digital element in the entire customer journey will do a world of good for life insurers.

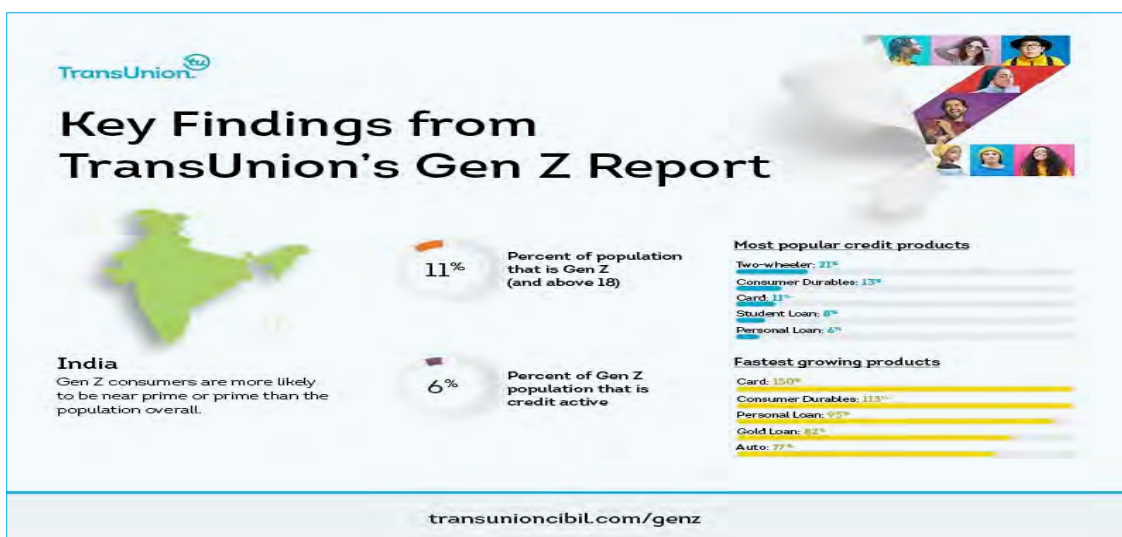


Figure 1: Transunion Gen Z Report (source: Transunion Study, 2024)



Figure 2: Ecommerce: market & Consumer Insight Report, 2024
(source: <https://ecommercedb.com>)

While there are opportunities aplenty for life insurance firms with respect to making digital offerings to the Gen Z customer, the traditional way of selling life insurance through agents might not appeal to a cohort that is already armed with information that is required for life insurance buying. Yet, with the agents getting transformed in all new digital avatar thanks to Covid 19, companies could still make the agents relevant for Gen Z. That's a possibility stored in the realms of the future and remains to be seen as to whether the agents are still a force to reckon with in a Gen Z dominated consumer landscape of the future.

Status Quo: How Are Gen Z Currently Been Served?

Some hard core facts would reveal that Gen Z are financially the least covered segment in urban India where 25% of the population is still uninsured (Max Life Insurance India Protection Quotient 6 Survey, 2024).

In light of the aforementioned facts, it would make an intriguing case to gauge what life insurers have to offer for Gen Z customers. For a cohort that lives in the present and by the motto YOLO (You Only Live Once) {bhartiata.com}, Policy Bazaar (an insurance aggregator) deliberates upon the plans currently being offered by companies to Gen Z customers and delineates which of those plans carry significance in the Gen Z scheme of things {policybazaar.com}.

Term Plans find a true match with Gen Z on various counts: Gen Z assuming role of a bread-earner in the house, Gen Z will benefit with a reduced premium towards young age, Gen Z's span of work life will be more and hence protection for self and family. The other plans that have the potential of luring the Gen Z customers are the endowment plans where Gen Z would be best served by taking guaranteed returns along with

protection; all this while being alive and kicking.

Unit Linked Insurance Plans (ULIPs), by nature should appeal more to the Gen Z customers because wealth creation from a young age with plans that have the added advantage of making systematic investment plans (SIPs) and protection would go a long way in fulfilling the aspirations of the ever-aspiring Gen Z cohort.

Also, in addition to the above, life insurance companies offer money back plans that can be of huge interest to the Gen Z populace simply because of certain milestones they set for themselves and getting returns on sum assured at regular intervals plus the bonus at the end of the policy term along with the remaining amount if they happen to outlive the sum assured.

Riders available with life insurance plans offer another great incentive for Gen Z to go for life insurance. With riders ranging from a slew of offerings like critical illness, accident, waiver of premium, etc. it makes for a reasoned argument to go for such offerings especially for a cohort as least unsecured as Gen Z.

Going Forward: Gen Z- Strategic Imperative for Life Insurers

At a time when the stakes in capitalizing the 'Gen Z Opportunity' in the scheme of things (read business opportunities in a digital-first India) is high, mere incremental changes won't suffice. Currently, they are limited to few products of their liking but gaining milestones

in their career and life would place Gen Z at the centre of life insurers' interests and hence it only pays to take the lead now and convert these Gen Z customers into loyal brand enthusiasts (Business Today, 2024).

The following **Strategic Imperatives** on part of the life insurers should be adopted to make the most use of this privileged opportunity.

1. **Product Innovation &**

Modularity: Sustained emphasis should be on designing and developing customized, flexible products that have the scaling advantage as major milestones in life arrive {livemint.com, 2024}. Offers such as pay-as-you-go options, wellness-linked discounts, and bundled life and health solutions that resonate with Gen Z's YOLO mindset and health consciousness, are business aspects worth exploring.

2. **Hyper-Personalised Digital**

Experience: With time at a premium for Gen Z and the associated less attention-span, it would pay (for the companies) to invest in AI-driven instant quoting, gamified apps, short-form video explainers, and seamless onboarding. Gen Z's inclination towards shorter policy issuances, personalized dashboards, and an interface that reduces complexity, is the sought-after digital experience that companies should cater to.

3. **Community & Social-Proof**

Marketing: By building online Gen Z dedicated communities;

peer reviewed content as proof; influencer partnerships; and user-generated content on social media, the companies will enhance their credentials as trust builders with the cohort.

4. **Accelerated Financial Literacy**

Initiatives: Striking a fine balance between attention-span and quality education, the companies would be best served by partnering with educational content creators and using digital channels to deliver relatable yet bite-sized education on life insurance (Tiwari & Yadav, 2022). All this with the honest intention of converting Gen Z from information-seekers to information-equipped buyers.

5. **Health & Wellness Ecosystem**

Partnerships: Perception of life insurance could well be the focal point in its promotion as a lifestyle enabler than a pure risk product and with that intention, the companies could offer discounts to gyms, fitness apps, and wellness platforms to those who show healthy behaviours (livemint.com, 2024).

6. **Phygital Distribution & Agent**

Transformation: Stressing on a hybrid model of distribution that complements the self-service forums, is an active mode of operation life insurers could resort to. This would require a lot of re-skilling - something which Max Life Insurance already does a lot - for agents as the 'new-age' Gen Z advisors securing personal touch with real-time digital tools.

7. **Ethical Data Use & Trust**

Architecture: With a heightened emphasis on data sharing aspect of Gen Z, it would be imperative for the insurers to incorporate visibility in data security features and to design transparent data practices.

Life insurance companies can no longer afford to treat Gen Z as a peripheral segment. In digital-first India, this generation represents a historic opportunity that demands urgent and decisive action. At present, Gen Z buys only a few products that appeal to them, but as they cross major career and life milestones, they will sit at the very centre of the industry's future growth. Companies that continue with mere incremental changes risk being left behind. The time to lead is now - those who act boldly today will convert these young customers into loyal, lifelong brand enthusiasts and secure a powerful competitive edge for the coming decade. The choice is clear: Companies that embrace these bold moves will not only capture this massive emerging market but also build enduring relationships that drive sustainable, long-term success. The Gen Z opportunity is here - the only question is who will seize it first.

Conclusion

Tipped as the most exciting segment for life insurers in the future, Gen Z stands out head and shoulders above any other cohort in terms of the online orientation of knowledge about products and services although lacking in financial literacy relatively. They represent a substantial chunk of business that is ripe for the taking

but demand a drastically different approach from life insurers. With digital incorporated into every aspect of their journey with a life insurer, they are bound to increase the representation of Gen Z in the coverage of life insurers. A word of caution, though, that Gen Z are by nature information seekers and corroborate information from many sources before arriving at a decision. While digital incorporation in their customer journey does have the most significant of impacts, the personal-touch that is inherent in life insurance selling should never be forgotten. The agent, at the first look of Gen Z cohort, might look a redundant force in their scheme of things yet since

agents too have donned a digital avatar of late thanks to Covid 19, the life insurers could still benefit from having an agent force that is knowledgeable and digitally equipped to handle a versatile customer in form of Gen Z. Although, agents are not much sought-after by this cohort, who knows a concerted effort could be brought to fruition and a new channel-customer fit could be arrived at. Further still, companies are advised to reach out to Gen Z through multiple touch-points, preserving the digital element and also rendering services physically. This two-pronged strategy is sure to provide handsome dividends in reaching out and converting a

seemingly tough segment like Gen Z. Already few life insurers are ahead of the distribution curve offering novelties in order to reach out to this coveted segment. Going forward, life insurers who align with Gen Z with the means and the wherewithal to engage them throughout their journey will be the ones that will stand tall amidst the disruptions brought by the cohort. This will strengthen the credentials of such life insurers in a tough and demanding customer base such as Gen Z. For the now, getting Gen Z into life insurers' folds is all up for the grabs when it comes to measures that align best with their requirements. **■**

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Term Insurance in India: Trends and Market Dynamics



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Abstract

This paper examines the evolving landscape of term insurance in India in the context of global protection-led insurance trends, regulatory reforms, and changing consumer behaviour. It highlights how India's life insurance market is shifting from savings-oriented products to pure risk protection, driven by rising income levels, post-pandemic risk awareness, digital transformation, and financial literacy initiatives. However, the study analyses the contrasting trends of stagnant insurance penetration and rising insurance density, revealing both growth potential and structural challenges. Further, the paper also evaluates the impact of IRDAI's regulatory initiatives, InsurTech innovations, and distribution reforms on market expansion.

Keywords

Term Insurance, Insurance Penetration, Financial Inclusion, Digital Insurance, Regulatory Reforms.

Introduction

India's life insurance industry is undergoing a paradigm shift from savings-oriented products to protection-led solutions. Term insurance, which offers high coverage at low premiums, is increasingly recognized as one of the most efficient risk protection tools, particularly in an environment marked by heightened risk awareness and economic uncertainty. Rising income levels, rapid urbanization, post-COVID-19 risk consciousness, and sustained financial literacy initiatives have collectively stimulated greater demand for term plans among Indian households. Despite these positive market drivers, overall insurance penetration in India continues to lag behind global averages. Insurance penetration defined as total premium as a percentage of GDP stood unchanged at 3.7% in the fiscal year 2024–25, (IRDAI). However, this represents stagnation relative to the previous year, stressing a structural challenge in expanding insurance reach in proportion to economic

growth. Within this aggregate figure, life insurance penetration edged down slightly to 2.7% from 2.8% the year before, while non-life insurance penetration remained flat at 1%. Although penetration remains modest, insurance density the per capita premium spend has shown gradual improvement, signaling incremental enhancement in individual participation. Further, during the financial year 2024–25, overall insurance density rose to approximately up from 97 (US Dollar) to 95 (US Dollar) in the financial year 2023–24. Life insurance density also saw a modest increase from 70 (US Dollar) to about 72 (US Dollar) per person, while non-life density held steady around 25 (US Dollar). These trends reflect slow but steady gains in average premium uptake on a per person basis, suggesting deeper engagement among policyholders even as overall coverage ratios remain subdued.

The juxtaposition of stagnating penetration with rising density highlights a uniquely dual market

dynamic. Firstly, the insurance sector including term insurance continues to grow in absolute terms with increasing premium collections and heightened consumer interest, particularly among younger and digitally perception segments. On the other hand, expansion relative to India's rapidly growing GDP and large uninsured population remains a key challenge. Analysts note that despite premium growth and increased policy purchase intent, especially after pandemic-induced risk awareness, the insurance market's share of national economic output remains at roughly half of the global average. In this context, term insurance's affordability and simplicity make it a critical vehicle for enhancing financial security across socio-economic strata. Scaling up penetration and improving market dynamics will require continued focus on digital distribution, financial literacy, and policy innovation to close the protection gap in India's burgeoning risk landscape.

Concept, Importance, and Global Trends of Term Insurance

Term insurance provides life cover for a specified period in return for a fixed premium, with benefits payable to nominees upon the policyholder's death. Unlike endowment or ULIP products, term plans focus purely on risk coverage, making them affordable and transparent. However, term insurance has emerged worldwide as the most efficient and transparent form of life protection, reflecting a decisive shift from savings-linked products to pure risk coverage. Across both developed

and emerging markets, households are increasingly prioritizing income protection, debt security, and family financial stability over complex investment-cum-insurance structures. This global reorientation has been accelerated by heightened mortality awareness after COVID-19, rising medical costs, and growing economic volatility, making term insurance a cornerstone of modern financial planning.

A defining global trend is the protection-first mindset. Consumers now view life insurance primarily as a safety net rather than a tax or investment tool. This has led to strong demand for high-sum-assured term plans, particularly among young professionals, dual-income households, and self-employed individuals who seek affordable yet comprehensive coverage. In mature markets such as the US, UK, and parts of Europe, term insurance has long dominated new policy sales; this pattern is now being replicated in fast-growing economies in Asia, Latin America, and Africa. Further, digital transformation is reshaping the global term insurance landscape like InsurTech platforms, AI-driven underwriting, e-KYC, and automated claims processing are reducing acquisition costs and turnaround times while enhancing customer experience. Instant policy issuance and data-based risk assessment are enabling insurers to reach previously underserved segments, including gig workers and micro-entrepreneurs. This digital shift has also intensified competition, driving down premiums and increasing transparency for consumers.

Another major trend is product customization and modularity. Global insurers are unbundling life cover and offering optional riders such as critical illness, disability income, and accidental death benefits. Flexible policy terms, increasing-cover options, and premium-return features allow customers to align protection with life-stage needs. This trend supports a more personalized and inclusive insurance ecosystem. Again, from a regulatory and ESG perspective, policymakers worldwide are encouraging protection-oriented products to enhance social resilience. Term insurance is increasingly linked to financial inclusion strategies, social security frameworks, and sustainable finance goals. By preventing families from falling into poverty due to the death of an earning member, term insurance contributes to long-term economic stability and social equity are key pillars of sustainable development.

Moreover, distribution channels are also evolving like bancassurance, digital marketplaces, and embedded insurance models (integrated with loans, e-commerce, and payroll platforms) are expanding the reach of term insurance at scale. These channels lower customer acquisition costs and integrate protection seamlessly into everyday financial transactions. Besides, the global term insurance market is expected to witness sustained growth driven by demographic changes, urbanization, credit expansion, and continued digital adoption. As longevity risks, climate-related uncertainties, and health vulnerabilities rise, the role of term insurance as a foundational

risk-management instrument will only strengthen.

In the light of the above, global trends point toward a future where term insurance is not a niche product but the backbone of household financial security delivering affordable, accessible, and sustainable protection in an increasingly uncertain world.

Term Insurance Growth and Market Trends in India

Term insurance has rapidly become a focal point of India's life insurance landscape, driven by rising risk awareness, expanding digital distribution, and evolving consumer preferences. Traditionally viewed as a product offering pure protection at affordable premiums, term insurance has gained prominence in financial planning especially in the post-COVID-19 era, where households increasingly prioritize income security and family protection. The term segment's growth mirrors broader currents in India's insurance market, which continues to expand in absolute terms even as key structural metrics like penetration show mixed results. According to the Insurance Regulatory and Development Authority of India (IRDAI), overall insurance penetration in India remained at 3.7% of GDP in the financial year 2024-25, roughly half of the global average, indicating that a large portion of the population still lacks adequate insurance coverage. Similarly, life insurance penetration dipped to 2.7%, while non-life insurance stayed flat at 1%, reflecting persistent challenges in scaling coverage

relative to economic growth. Despite the sluggish penetration figures, the industry's insurance density per capita premium spend has shown modest improvement, underscoring deeper engagement from policyholders as incomes rise and awareness improves. Further, growth in life insurance premiums has been notable; collections reportedly increased around 7% in the financial year 2024-25, reaching approximately Rs. 8.86 lakh crore, even as penetration percentages edged lower. Hence, term insurance, being the most affordable life cover option, plays a significant role in this trend. Expansion of digital channels and InsurTech platforms has made term plans more accessible, enabling customers to compare offerings, complete e-KYC, and buy policies online with minimal friction.

These distribution innovations have broadened term insurance reach, particularly among young and digitally knowledge segments, in urban and semi-urban India. Growth in first-year and renewal premiums key indicators of new customer acquisition and retention has been healthy, with some reports noting double-digit increases in new business premiums in early 2025. Another important aspect is market structure also further highlights the competitive landscape: State-owned insurers like Life Insurance Corporation of India (LIC) continue to dominate, holding about 68.6% market share, while private players such as SBI Life, HDFC Life, and ICICI Prudential Life together contribute a significant portion of term and other life insurance segments. In response to these dynamic developments, regulatory support

and innovation remain critical. Continued digital adoption, product customization (e.g., riders for critical illness and disability), and efforts to improve financial literacy are expected to sustain term insurance growth. As India's insurance sector modernizes, term insurance will play a central role in closing the protection gap and strengthening financial resilience across diverse socio-economic strata.

Term Insurance in India: Regulatory and Policy Environment

The regulatory and policy framework governing India's insurance sector has undergone significant transformation in recent years, with the Insurance Regulatory and Development Authority of India (IRDAI) playing a central role in building a more transparent, competitive, and consumer-centric insurance ecosystem. These reforms are particularly important for the growth of term insurance, which relies heavily on trust, affordability, and clarity of contract to attract long-term policyholders.

One of the key objectives has been to simplify policy structures and enhance disclosure norms. Through standardized product guidelines, benefit illustrations, and clear communication of exclusions and claim settlement processes, the regulator has reduced information asymmetry between insurers and consumers. This has strengthened consumer confidence in term insurance products, which are often perceived as complex due to underwriting conditions and medical requirements.

The promotion of E-insurance and digital policy issuance is another major reform. IRDAI has encouraged insurers to adopt electronic KYC, E-policies, and digital servicing platforms, thereby reducing paperwork, operational costs, and turnaround time. These initiatives have been instrumental in expanding the reach of term insurance, especially among tech-savvy urban populations and remote customers who can now access policies without physical branch visits.

To foster innovation, IRDAI introduced the regulatory sandbox framework, which allows insurers, intermediaries, and InsurTech firms to test new products, distribution models, and underwriting technologies in a controlled environment. This has enabled experimentation with AI-based risk assessment, wellness-linked pricing, usage-based products, and instant underwriting models many of which are now being deployed in term insurance offerings. Such innovation has helped improve pricing accuracy, reduce fraud, and offer more personalized coverage.

The move towards composite licensing is another landmark policy reform. By allowing insurers to offer both life and general insurance products under a single license, IRDAI aims to improve operational efficiency, expand product portfolios, and enhance competition. For term insurance, this opens up opportunities for bundling life cover with health, accident, or disability

insurance, creating comprehensive protection solutions for consumers.

Further, IRDAI's focus on market conduct, grievance redressal, and claim settlement discipline has strengthened consumer protection. Measures such as the Integrated Grievance Management System (IGMS), tighter timelines for claim processing, and stronger oversight of intermediaries ensure that policyholders receive fair treatment and timely service critical factors for building trust in long-term protection products like term insurance.

Overall, India's evolving regulatory and policy environment is creating a supportive foundation for the sustained growth of term insurance. By balancing innovation with consumer protection and promoting digital and competitive markets, IRDAI is enabling term insurance to emerge as a cornerstone of financial security and inclusive growth in India.

Challenges and Critical Success Factors of Term Insurance

India's term insurance market is expanding steadily, yet it continues to face several structural and operational challenges. At the same time, certain critical success factors can determine whether the sector achieves widespread financial inclusion and sustainable growth.

A. Key Challenges

- **Low Penetration in Rural and Informal Sectors:** A significant portion of India's population is engaged in agriculture, self-

employment, or informal work, where income is irregular and financial planning is limited. These groups often view insurance as a non-essential expense, resulting in very low term insurance penetration in rural and semi-urban areas.

- **Lack of Awareness and Trust:** Many households are unaware of the benefits of term insurance or confuse it with investment-oriented policies. Past experiences of claim disputes and poor service have also reduced trust in insurance companies, making people reluctant to purchase protection-only products.
- **Mis-selling and Complex Policy Terms:** Insurance is sometimes sold as a tax-saving or investment tool rather than a risk protection product. Complex exclusions, medical clauses, and fine print lead to misunderstandings, claim rejections, and customer dissatisfaction, which damages the credibility of term insurance.
- **Limited Distribution in Remote Areas:** The shortage of trained insurance agents and digital infrastructure in remote and rural regions restricts market outreach. Physical access to insurers, medical facilities for underwriting, and policy servicing remains a major bottleneck.

B. Critical Success Factors

- **Financial Literacy and Awareness Campaigns:** Targeted awareness programs explaining the importance of income

protection, family security, and risk management can significantly increase demand for term insurance, especially among first-time buyers.

- **Simplified and Transparent**

Products: Clear policy wording, standardized terms, and easy-to-understand benefit illustrations improve consumer confidence and reduce disputes. Simpler products encourage higher uptake and retention.

- **Digital Distribution and InsurTech:**

Online platforms, mobile apps, and AI-based underwriting help insurers reach wider audiences at lower costs. Digital channels are especially effective for young professionals and rural customers with smartphone access.

- **Strong Regulatory Oversight:**

IRDAI's focus on transparency, grievance redressal, and claim settlement timelines builds trust and protects policyholders, which is vital for the long-term success of term insurance.

- **Expansion of Agent Networks and Partnerships:**

Training local agents, partnering with banks, fintech firms, and microfinance institutions can improve outreach in underserved regions and boost insurance inclusion.

insurance density, growing premium collections, and expanding digital adoption indicate a steady deepening of protection awareness. Global trends toward protection-first insurance, coupled with India's post-pandemic risk consciousness, have repositioned term insurance from a tax-saving tool to a vital instrument of household financial security. Regulatory reforms by IRDAI, InsurTech innovation, and competitive market dynamics have further strengthened transparency, accessibility, and consumer trust. Despite challenges such as low rural penetration, mis-selling, and

limited awareness, term insurance is increasingly playing a decisive role in bridging India's protection gap and enhancing socio-economic resilience. Going forward, the future of term insurance in India appears highly promising. Digital platforms, AI-based underwriting, and embedded insurance models will dramatically expand outreach, especially in rural and informal sectors. With sustained financial literacy, stronger regulatory oversight, and product customization, term insurance will evolve into a universal safety net, supporting India's vision of inclusive growth and long-term financial stability. **II**

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Conclusion

The study clearly establishes that term insurance is emerging as the backbone of India's evolving life insurance ecosystem. While insurance penetration remains modest at 3.7% of GDP, rising

Trends in Healthcare Claims Analytics: Implications for Insurers and TPAs



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Abstract

The study titled Trends in Healthcare Claims Analytics explores the performance, efficiency, and operational trends of claim management in the health-insurance sector. Using data sourced from IRDAI and the General Insurance Council for the financial years 2021-24, the research evaluates key indicators such as the Incurred Claims Ratio, Claim Settlement Ratio, Repudiation Rates, Turnaround Time and the role of Third-Party Administrators.

The analysis reveals that the industry has achieved substantial maturity, with an average ICR of around 82.5% and 83% of claims settled. Despite these improvements, challenges persist in the form of documentation errors, non-disclosure of pre-existing diseases and policyholder unawareness regarding exclusions and waiting periods. Public-sector insurers continue to record higher ICR owing to their group health schemes, while private health insurers show relatively faster claim TAT's. However, further gains require robust fraud-

detection systems and enhanced consumer education. These measures will ensure a more equitable and sustainable health-insurance ecosystem in India.

Keywords

Health Insurance, Claim Settlement, Incurred Claims Ratio, Third-Party Administrator, IRDAI.

Introduction

The primary purpose of this project is to conduct a structured and data-driven evaluation of the health-insurance claim process in India, using verified secondary information from regulatory and industry sources. The study aims to identify performance trends, highlight operational gaps and suggest measures for strengthening efficiency, transparency, and policyholder satisfaction.

The objectives are divided into general and specific categories for clarity.

General Objective

To analyze the overall performance of the Indian health-insurance claim

ecosystem during the financial years 2021-22 to 2023-24 and assess how claim-management practices influence consumer confidence and insurer sustainability.

Specific Objectives

1. **To examine industry-wide claim ratios**—including *incurred-claims ratio (ICR)* and *claim-settlement ratio (CSR)*—for identifying efficiency trends among public, private and standalone health insurers.
2. **To evaluate the turnaround time (TAT)** for claim processing and determine the proportion of claims settled within IRDAI-prescribed time limits.
3. **To study the pattern of claim repudiation** and identify the most frequent reasons for rejections and delays.
4. **To compare performance between insurer categories** (public-sector, private, and standalone health insurers) and interpret how structural or operational factors affect claim outcomes.

- 5. **To analyze the role of third-party administrators (TPAs)** in claim settlement and examine how digital integration under the Ayushman Bharat Digital Mission (ABDM) has influenced efficiency.
- 6. **To assess regulatory impact**—how IRDAI’s circulars, master guidelines, and grievance mechanisms contribute to improving claim transparency and consumer protection.
- 7. **To propose recommendations** for insurers, TPAs, and policymakers to reduce repudiation, minimize delays, and enhance overall claim experience.

Methodology and Data Analysis

For this project, a **descriptive–analytical research design** has been adopted, integrating both quantitative and qualitative techniques to ensure comprehensiveness and credibility.

1. Data Sources

Primary sources include:

- **Insurance Regulatory and Development Authority of India (IRDAI):** Annual Reports (FY 2021–22, 2022–23, 2023–24); Master Circular on Health Insurance (2024); and policyholder protection guidelines.
- **General Insurance Council (GIC):** *Indian Non-Life Insurance Yearbook 2023–24*, providing claim statistics and aggregated financial ratios.

2. Variables and Indicators

The following key variables and indicators were selected to measure claim performance:-

Variable	Definition	Purpose
Incurred Claims Ratio (ICR)	(Net Incurred Claims ÷ Net Earned Premium) × 100	Indicates insurer efficiency and underwriting adequacy.
Claim Settlement Ratio (CSR)	(Claims Settled ÷ Total Claims Reported) × 100	Reflects service quality and claim-handling performance.
Repudiation Rate	(Claims Rejected ÷ Claims Reported) × 100	Shows proportion of claims denied due to policy or documentation issues.

Variable	Definition	Purpose
Turnaround Time (TAT)	Average duration between claim intimation and final settlement	Represents speed and operational efficiency.
Pending Claims Ratio	(Claims Pending ÷ Claims Reported) × 100	Indicates unresolved workload and system delay.
TPA Efficiency Index	Qualitative assessment based on settlement time and accuracy	Measures third-party administrator performance.

3. Analytical Approach

3.1 Objective of Analysis

The principal objective of the analysis is to evaluate the performance of the Indian health insurance sector in claim settlement efficiency, repudiation management, and financial sustainability. Specifically, the analysis seeks to:

1. Examine year-on-year trends in **Incurred Claims Ratio (ICR)** and **Claim Settlement Ratio (CSR)**.
2. Assess variations in **Turnaround Time (TAT)** and **claim outcome distribution**.
3. Compare claim performance between **public sector insurers**, **private general insurers**, and **standalone health insurers (SAHIs)**.
4. Identify major reasons for claim repudiation.

3.2. Analytical Tools and Techniques

The following tools were used for numerical interpretation:

Tool / Method	Purpose
Ratio Analysis	To measure financial efficiency using ICR, CSR, and repudiation rate.
Trend Analysis	To track changes in claims ratios and settlement patterns over three years.
Comparative Analysis	To contrast PSU, private, and standalone health insurer performance.
Percentage Analysis	To determine the share of each claim outcome (settled, rejected, pending).
Graphical Analysis	To visualise ratios, settlement time, and rejection reasons through charts.

3.3 Computation Formulas

Key ratios used in the analysis were computed as follows:

1. Incurred Claims Ratio (ICR)

$$\text{ICR} = \frac{\text{Net Incurred Claims}}{\text{Net Earned Premium}} \times 100$$

2. Claim Settlement Ratio (CSR)

$$\text{CSR} = \frac{\text{Claims Settled}}{\text{Claims Reported}} \times 100$$

3. Repudiation Rate

$$\text{Repudiation Rate} = \frac{\text{Claims Rejected}}{\text{Claims Reported}} \times 100$$

4. Pendency Rate

$$\text{Pendency Rate} = \frac{\text{Claims Pending}}{\text{Claims Reported}} \times 100$$

5. Average Settlement Time (TAT)

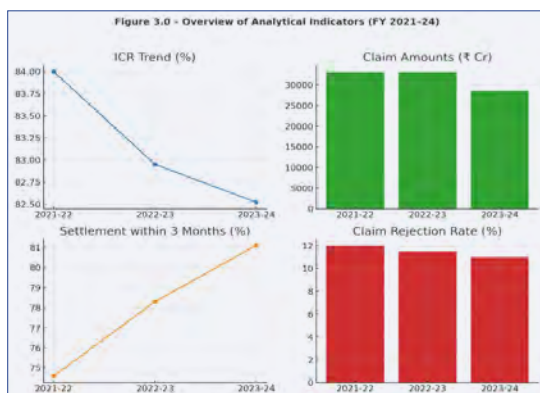
$$\text{Average TAT} = \frac{\text{Total Settlement Days}}{\text{Number of Claims Settled}}$$

3.4 Graphical Representation

Visualisation was a core part of the analytical approach to facilitate comprehension of complex numerical patterns. Charts generated include:

- **Line Graphs:** Depicting annual ICR trends across insurer groups.
- **Bar Charts:** Showing claim settlement distribution by time bracket and rejection reasons.
- **Pie Charts:** Representing claim outcome composition (settled, rejected, pending).
- **Stacked Bars:** Comparing PSU vs. private vs. standalone insurer ratios.

Figure 3.0 – Overview of Analytical Indicators (FY 2021-24)



3.5 Industry Overview – Claim Ratios

Table 3.1 – Incurred Claims Ratio (Non-life Health Business)

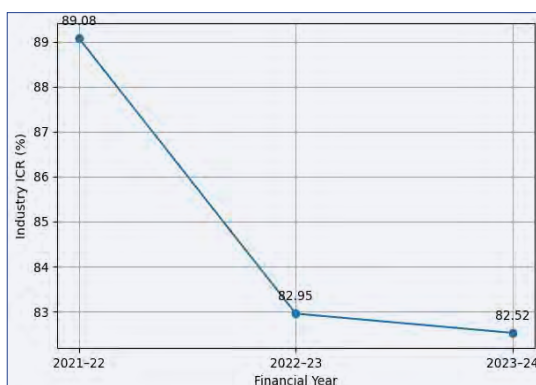
Financial Year	Incurred Claims Ratio (%)
2021 – 22	89.08
2022 – 23	82.95
2023 – 24	82.52

Source: IRDAI Annual Reports (FY 2021-22 to FY 2023-24), Non-Life Insurance Industry – Net Incurred Claims Ratio statistics.

Interpretation:

The ICR shows a marginal downward trend, indicating improved cost control and underwriting accuracy. The decline from 84 % to 82.52 % suggests enhanced claims-screening, fraud detection, and hospital-network rationalisation.

Figure 3.1 – Line Chart of ICR Trend



3.6 Aggregate Claim Amounts (GIC Data)

Table 3.2 – Amount of Claims Reported (₹ Crore)

Financial Year	Amount of Claims Reported (₹ Crore)
2021 – 22	99,502
2022 – 23	1,07,583
2023 – 24	1,17,115

Source: IRDAI Annual Reports (FY 2021-22 to FY 2023-24), Health Insurance Business – Status of Claims Tables.

Interpretation:

Claim volumes contracted in FY 2023-24 as post-pandemic medical utilisation normalised and insurers strengthened claim-vetting procedures.

Figure 3.2 – Bar Chart of Claim Amounts FY 2021-22 to 2023-24

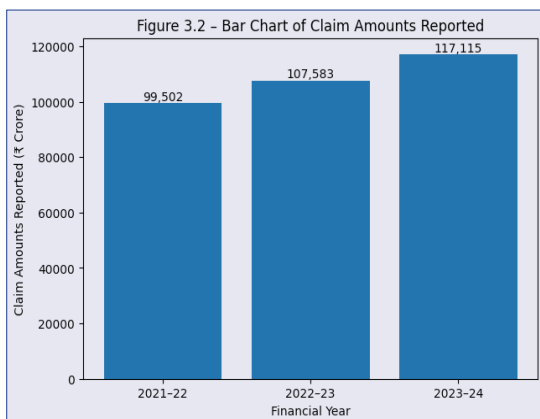
**3.8 Claim Outcome Analysis**

Table 3.3 – Health Claim Outcomes (FY 2023-24)

Claim Outcome Category	Number of Claims (in Lakh)	Share of Total Claims (%)	Remarks
Settled	197.5	83 %	Indicates successful claim settlement by insurers within the reporting period.
Rejected / Repudiated	26.1	11 %	Major reasons: non-disclosure, waiting-period clause, incomplete documentation.
Pending / Under Process	14.3	6 %	Awaiting additional documents or medical clarification.
Total	237.9	100 %	

Source: IRDAI Annual Report 2023-24 health insurance claim settlement statistics.

Interpretation:

A large majority of claims were settled successfully. The rejection rate of 11 % largely due to non-disclosure or documentation issues remains a key focus area for insurers.

Figure 3.3 – Pie Chart of Claim Outcomes (FY 2023-24)

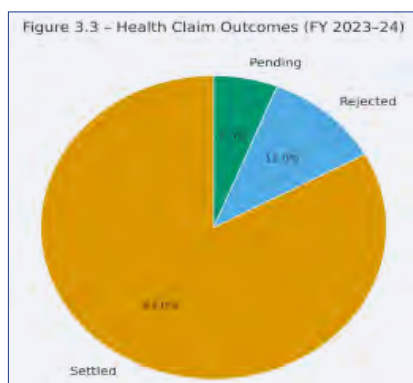
**3.9 Turnaround Time (TAT)**

Table 3.4 – Claim Settlement Time Distribution (FY 2023-24)

Settlement Time Bracket	Number of Claims (in Lakh)	Share of Total Claims (%)	Remarks
Within 3 months	192.9	81.13 %	Reflects timely settlements enabled by digitised and cashless processes.
3 – 6 months	38.7	16.30 %	Delay mainly due to documentation queries and hospital clarifications.
More than 6 months	6.1	2.57 %	Older or disputed cases, sometimes linked to fraud or arbitration.
Total	237.7	100 %	

Source: IRDAI Annual Report 2023-24, Health Insurance Claims Settlement Statistics and Turnaround Time (TAT) data.

Interpretation:

Over 81 % of claims were settled within three months — a strong performance compared with the 74 % achieved in FY 2021-22. Digital-workflow adoption under the Ayushman Bharat Digital Mission (ABDM) has significantly improved cycle time.

Figure 3.4 – Bar Chart of Settlement Time Distribution

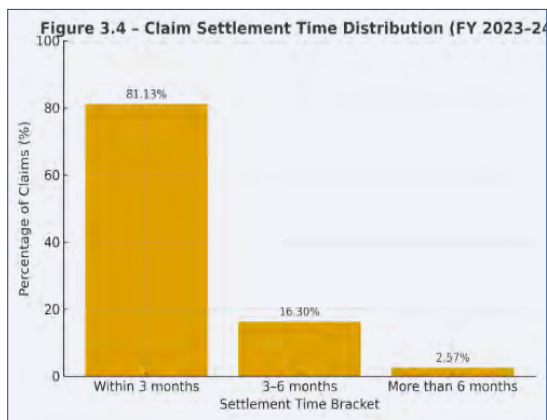
**3.10 PSU vs Private Insurer Performance**

Table 3.5 – Comparative Performance by Insurer Group (FY 2023–24)

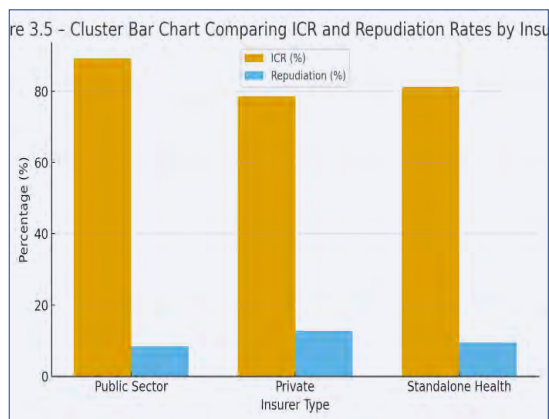
Insurer Group	Average ICR (%)	Claim Repudiation (%)	Average TAT (days)
Public Sector Insurers	89.2	8.4	42
Private Insurers	78.6	12.7	35
Standalone Health Insurers	81.3	9.5	32

Source: IRDAI Annual Report 2023-24 and IRDAI Handbook of Insurance Statistics.

Interpretation:

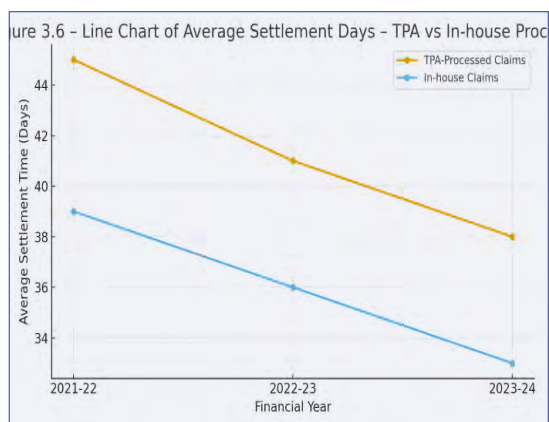
Public-sector insurers show higher ICRs because of their group-policy exposure. Private and standalone health insurers exhibit lower ICRs but slightly higher repudiations, indicating tighter scrutiny.

Figure 3.5 – Cluster Bar Chart Comparing ICR and Repudiation Rates by Insurer Type

**3.11 Third-Party Administrator (TPA) Performance**

Third-Party Administrators (TPAs) play a central role in India's health-insurance claim ecosystem. They are licensed entities authorised by the IRDAI to process and settle claims on behalf of insurers, especially for retail and group policies. TPAs manage claim intimation, hospital network liaison, document verification, and communication with insured persons. TPAs handle nearly 60 percent of retail health claims.

Figure 3.6 – Line Chart of Average Settlement Days – TPA vs In-house Processing



3.12 Clause-wise Claim Rejections

Table 3.6 – Top Reasons for Claim Repudiation
(FY 2023-24)

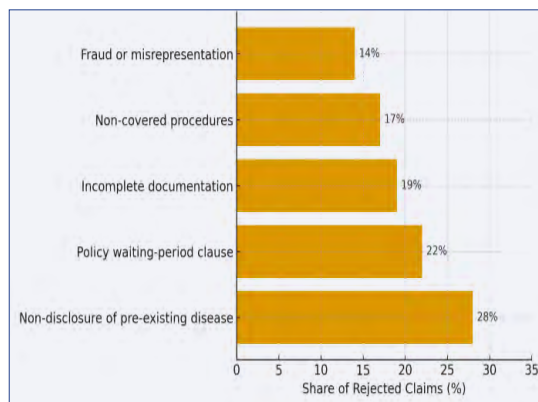
Reason for Repudiation	Approx. Share of Total Rejected Claims (%)	Remarks
Non-disclosure of pre-existing disease	28%	Most common cause; applicants often fail to declare prior medical conditions accurately at proposal stage.
Policy waiting-period clause	22%	Claims made within initial waiting periods (typically 2–4 years) for specified ailments are not admissible.
Incomplete or missing documentation	19%	Hospitals/claimants fail to furnish discharge summaries, prescriptions, or diagnostic reports
Non-covered procedures or exclusions	17%	Treatments falling outside policy scope (cosmetic, experimental, or alternative therapies).
Fraudulent or misrepresented claims	14%	Suspected manipulation of bills, falsified records, or duplicate claims.
Total	100 %	

Source:IRDAI Annual Report 2023–24 and Business Standard Report on Health Insurance Claim Rejections FY24

Interpretation:

The leading causes of repudiation continue to be disclosure-related. The data highlight the need for clearer proposal-stage communication and uniform claim-documentation protocols.

Figure 3.7 – Bar Chart of Major Rejection Causes
(FY 2023-24)



Results and Discussion

4.1 Introduction

The objective of this chapter is to interpret and discuss the results derived from the analytical framework established in Chapter 3. While the previous chapter focused on data presentation and statistical computation, the current chapter emphasises **thematic interpretation** of those findings in light of India's evolving health-insurance ecosystem.

Over the last three years (FY 2021–22 to 2023–24), the Indian health-insurance sector has undergone structural transformation through digitalisation, regulatory standardisation, and data-driven oversight. IRDAI's Master Circular (2024) and integration with the Ayushman Bharat Digital Mission (ABDM) have particularly strengthened claim transparency and operational efficiency. The period also marked post-pandemic recovery, making this an ideal time to assess both quantitative and qualitative aspects of claim management.

4.2 Overview of Findings

The overall claim performance indicators demonstrate a steady movement toward improved efficiency and standardisation:

- The **Incurred Claims Ratio (ICR)** declined marginally from **84.00% in FY 2021–22** to **82.52% in FY 2023–24**, suggesting enhanced underwriting discipline and fraud control.

- The **Claim Settlement Ratio (CSR)** stood at approximately **83%** in FY 2023–24, showing consistent service quality across the industry.
- **Turnaround Time (TAT)** improved considerably, with **81% of claims settled within three months** compared with 74.6% in FY 2021–22.
- The **Repudiation Rate** remained stable at **11%**, but the primary causes continue to be non-disclosure of pre-existing conditions and incomplete documentation.

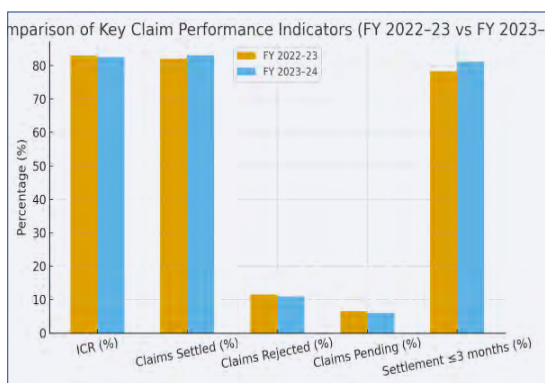
Summary of Key Observations

Indicator	Observation	Trend	Implication
Incurred Claims Ratio (ICR)	84.0% → 82.5%	↓	Improved cost control
Settlement within 3 Months	74.6% → 81.1%	↑	Faster processing
Repudiation Rate	~11%	Stable	Need for better disclosure
TPA Settlement Days	45 → 38 days	↓	Improved coordination
Digital Claims Adoption	Expanding rapidly	↑	Positive for transparency

4.3 Trends in Claim Performance

The downward trend in ICR between FY 2021-22 and FY 2023-24 suggests enhanced underwriting discipline and cost control. Public-sector insurers, due to their

Figure 4.1 – Comparison of Key Claim Performance Indicators (FY 2022–23 vs FY 2023–24)



dominance in group and social-insurance portfolios, continue to show higher ICRs, while standalone health insurers maintain efficient ratios because of focused underwriting.

4.4 Claim-Settlement Ratios and Turnaround Time

The Claim Settlement Ratio (CSR) remains consistently high at over 80 percent for the industry. Nevertheless, turnaround time differs significantly between public-sector and private insurers.

Public-sector insurers often deal with large-volume employer and government health schemes, resulting in longer documentation cycles and hospital network constraints.

Private and standalone health insurers benefit from digitised systems, achieving faster claim turnaround though sometimes at the cost of slightly higher repudiations.

The improvement in claim-settlement time is one of the most positive outcomes of the period under study.

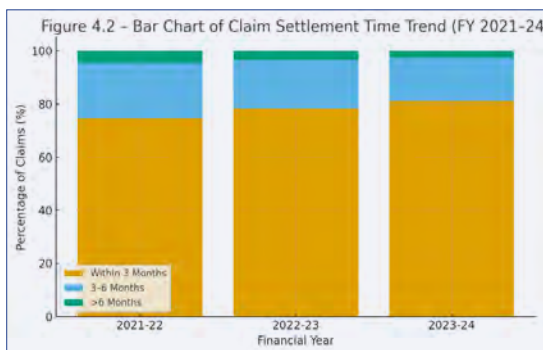
Table 4.1 – Claim Settlement Time Trend (FY 2021–24)

Financial Year	≤ 3 Months (%)	3–6 Months (%)	> 6 Months (%)
2021–22	74.6	20.8	4.6
2022–23	78.3	18.2	3.5
2023–24	81.1	16.3	2.6

The table indicates a continuous improvement in processing time. The percentage of claims settled within three months rose by nearly seven percentage points over three years.

Source: IRDAI Annual Reports and Indian Insurance Statistics Handbooks (FY 2021–22 to FY 2023–24).

Figure 4.2 – Bar Chart of Claim Settlement Time Trend (FY 2021–24)



Interpretation:

This progress is largely attributed to:

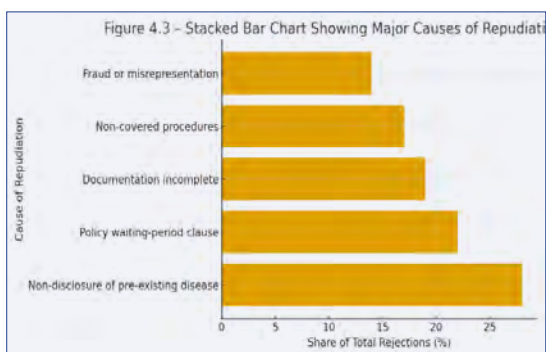
- Implementation of **e-claims and paperless documentation**;
- Mandatory adherence to IRDAI turnaround standards; and
- Increased integration between insurers and TPAs under the ABDM platform.

4.5 Repudiation and Pendency Trends

Repudiation and pendency remain persistent issues. **11%** of claims were rejected in FY 2023–24, and **6%** were pending at year-end.

The main causes include non-disclosure of pre-existing conditions (28%), policy waiting periods (22%), and documentation gaps (19%).

Figure 4.3 – Stacked Bar Chart Showing Major Causes of Repudiation



4.6 Public vs. Private Sector Comparison

Public insurers such as New India Assurance, United India Insurance, Oriental Insurance, and National Insurance dominate the group health-insurance segment. Their ICR is higher primarily due to government-sponsored schemes and public-sector employee coverage.

Private insurers, by contrast, focus on individual retail products with tighter underwriting and fraud-control practices. Standalone health insurers (SAHIs) such as Star Health, Niva Bupa, and Care Health Insurance show a balanced mix of claim turnaround and moderate repudiation rates.

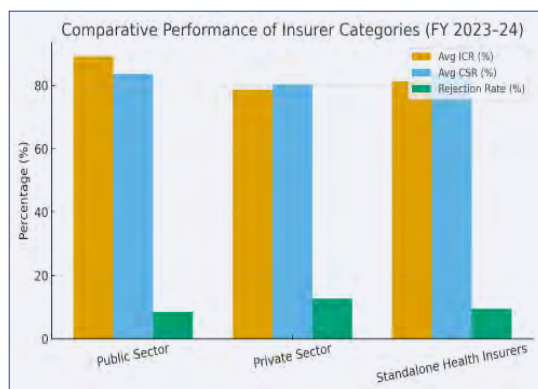
Table 4.2 – Comparative Performance of Insurer Categories (FY 2023–24)

Insurer Category	Avg. ICR (%)	Avg. CSR (%)	Rejection Rate (%)	Avg. TAT (days)
Public Sector	89.2	83.6	8.4	42
Private Sector	78.6	80.3	12.7	35
Standalone Health Insurers	81.3	84.2	9.5	32

The above data show that while private insurers maintain better profitability, public insurers perform better in settlement reliability for large group schemes.

Source: IRDAI Annual Report 2023–24 and comparative analysis of public, private and standalone health insurers published in industry reports.

Figure 4.4 – Comparative Performance of Insurer Categories (FY 2023–24)



Interpretation:

- Public insurers prioritise claim service over profitability.
- Private insurers focus on operational control and sustainable risk management.
- Standalone health insurers achieve a balanced performance due to technology-driven systems.

4.11 Summary of Key Findings**Table 4.4 – Summary of Key Findings (FY 2023–24)**

Indicator	Observation (FY 2023–24)	Trend (vs FY 2022–23)
Incurred Claims Ratio (ICR)	82.52 %	↓ Marginal improvement (better underwriting)
Claims Settled	83 %	↑ Slight increase in settlement rate
Claims Rejected	11 %	↓ Gradual decline in repudiations
Claims Pending	6 %	→ Stable level
Settlement within 3 months	81.13 %	↑ Improved timeliness of claim processing
Dominant Rejection Reason	Non-disclosure of pre-existing disease	Persistent issue
TPA Share in Retail Claims	60 %	→ Largely unchanged
Average Turnaround Time (TAT)	36 days (overall)	↓ Reduced due to digital submission and e-KYC
Public vs Private ICR Gap	~10 percentage points	→ Stable structural difference
Digital Adoption	Over 70 % of insurers integrated with ABDM / HCX	↑ Strong improvement

Interpretation:

The year FY 2023–24 marked steady operational improvement for India's health-insurance industry. Claim settlements rose modestly, rejection and pendency rates declined, and digitalisation accelerated across insurers and TPAs.

4.12.1 Overview of Claim Performance

The analysis revealed that the overall **Incurred Claims Ratio (ICR)** of the non-life health-insurance business has stabilised between 82 % and 84 %

during FY 2021–22 to FY 2023–24. Public-sector insurers continue to report higher ICRs (above 87 %) due to their larger share in government and social-health portfolios, while private and standalone health insurers operate with relatively leaner risk profiles and stricter cost control.

4.12.2 Efficiency in Claim Settlement

The **Claim Settlement Ratio (CSR)** improved steadily from 80.4 % in FY 2021–22 to 83 % in FY 2023–24, while the proportion of claims settled within three months increased to 81 %. This demonstrates enhanced operational efficiency supported by digitisation and the IRDAI's push for paper-less processing. The data indicate that most insurers now comply with the regulator's benchmark turnaround time (TAT) of 30 days for straightforward cashless claims.

4.12.3 Claim Repudiation and Documentation Gaps

Approximately 11 % of claims were rejected in FY 2023–24, primarily because of incomplete documentation, non-disclosure of pre-existing ailments, or exceeding policy sub-limits. The pattern shows a direct link between the level of consumer awareness and repudiation frequency.

4.12.5 Public vs Private Sector Insights

Public-sector insurers continue to carry the burden of social-sector and group-health schemes, leading to higher claim ratios and slower settlements. Their exposure to smaller

hospitals with limited IT infrastructure often delays documentation. Conversely, private and standalone health insurers have leveraged enterprise-grade technology and selective network tie-ups to shorten claim cycles and maintain profitability.

4.12.6 Impact of Regulatory Interventions

IRDAI's regulations have played a decisive role in shaping claim efficiency. Key regulatory drivers include:

1. **Master Circular on Health Insurance Business (2024)** – introduced uniform claim processes and mandatory TPA oversight.

2. **IGMS 2.0 Platform** – digital grievance portal for real-time monitoring of claim complaints.
3. **Business Analytics Platform (BAP)** – data repository for insurer performance benchmarking.

4.13 Concluding Remarks

The **Incurred Claims Ratio (ICR)** stabilised around 82.5 percent, while claim-settlement performance improved to 83 percent, with over 81 percent of claims settled within three months.

Comparative analysis showed that **public-sector insurers** continue to record higher ICRs owing to large social-scheme portfolios, whereas **private and standalone health**

insurers achieved faster settlement and better cost control through technology-driven processes. Third-Party Administrators (TPAs) still manage the majority of retail claims, though in-house digital processing is gradually expanding among private insurers.

Operational challenges such as incomplete documentation, non-standard digital formats, and hospital-response delays remain significant, but regulatory reforms—particularly the IRDAI Master Circular (2024), Health Claim Exchange (HCX) framework, and ABDM integration—are addressing these gaps. Overall, the sector demonstrates increasing maturity, transparency, and customer-centricity. **IR**

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Road Fatalities and Disabilities: An Investigation on the Insurance Scenario in India



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Abstract

Despite significant efforts toward road safety, India accounts for the highest number of road fatalities globally, impacting millions of families every year.¹ Road accidents often leave severe economic impact on the victims/survivors/families apart from the more visible part which is trauma, loss of life or disability. Compensations for road accident fatalities and disablements as well as treatment costs incurred by the injured are to be borne by the entity responsible for the accident. The legal liability of the entity that caused the accident would be borne by an insurer if an insurance arrangement exists. Corresponding to the economic stratification of the population, a large percentage of road users and accident victims belong to economically weaker sections, lower middle-income groups and those working in the informal sector. These highly vulnerable segments of the society require insurance for any meaningful financial protection. Support in the form of doles from Govt.al and charitable agencies (if available) are meagre, and often the support process itself deprives the victims of their dignity.

Again, for providing meaningful support to the road accident victims, high levels of efficacy of the insurance system would be imperative. In this context, this study examines the existing support systems available with a focus on the insurance mechanism and suggests means for making them more relevant and meaningful for victims of road accidents. The insurance support system available for victims of road accidents can be summarised as (a) Motor Third Party Liability insurance mandated under the Motor Vehicles Act for any vehicle that plies in a public place, (b) Personal Accident policies sold by Non-Life Insurance companies covering death and disabilities caused by a range of accidents of which road accidents are a part of, including the Govt. sponsored Pradhan Mantri Suraksha Bima Yojana (PMSBY), (c) Life Insurance policies that offer death cover including death due to road accidents as well as riders attached to base policies of Life Insurance offering an additional cover for Death due to accident, and Permanent disability resulting from accident causing inability to get or continue any gainful employment on a permanent basis.

1. Background:

The economic analysis of accident law indicates that accident costs consist of primary, secondary and tertiary cost². Primary costs of road accidents are the actual costs incurred by the affected parties for treatment and nursing care, loss of income/ wages, costs of vehicle repairs, replacement and alternate transportation, legal costs, emotional trauma, dependency and compromise on dignity, and in some markets, increased cost of insurance, etc.³ Secondary costs refer to family and societal costs and shared resources. This includes the financial impact including debt traps due to loss of life and disabilities on families, the emotional and psychological trauma of relatives, loss of common facilities like traffic congestion resulting in loss of time, excess fuel consumption⁴, and increased environmental impacts on the society.⁵ Tertiary costs refer to the economic costs absorbed by the Govt.al systems. This includes costs of free emergency medical services for accident victims, expenses for police investigations and legal proceedings, damage to public infrastructure such as roads, bridges,

¹ **Caveat:** This article is an abridged version of a paper originally presented at the 10th International Conference on Law and Economics (ICLE) at IIT Kharagpur. It is published in the III Journal with due permissions, with some updation of data. Views expressed are those of the Authors only and may not reflect the views of any organisation they are associated with.

² Hines Law Firm, The True Costs of Car Accidents Beyond Medical Bills (November, 2024) - <https://hineslaw.org/blog/true-costs-of-car-accidents>

³ National Safety Council, Costs of Motor-Vehicle Crashes - Injury Facts (2022) - <https://injuryfacts.nsc.org/all-injuries/costs/guide-to-calculating-costs/data-details/>

⁴ American Association of State Highway and Transportation Officials (AASHTO) Journal, TRIP Report Examines Causes & Costs of Traffic Fatalities (2023) - <https://aashtojournal.transportation.org/trip-report-examines-causes-costs-of-traffic-fatalities/>

⁵ US Study: One year of road crashes cost society \$340 billion, AP News - <https://apnews.com/article/automotive-accidents-business-90eea0f48ada8522dd>

traffic signals⁶ etc., costs of public awareness campaigns promoting road safety, and loss of productivity on the overall economy.⁷ Primary costs of accidents related to physical injury and vehicle damages as well as some of the secondary costs are too high for individuals to bear. These are typically mitigated by transferring them to the insurance mechanism (risk spreading), and deep pocket methods. Tertiary costs can be addressed to some extent by the surplus generated from the reduction of primary and secondary costs.

As per the latest National Crime Records Bureau (NCRB, 2023), the National Highway network accounts for 30.3 per cent) the highest road crashes. In addition, the report of 2023 states that 'over-speeding' contributes to 61.4 per cent (59 per cent as per NCRB, 2022) of the fatalities and 58.6 per cent (62.6 per cent as per NCRB, 2022) of the accidents, while factors like 'dangerous or careless driving, overtaking' result in 26 per cent of the fatalities and 23.7 per cent (24.7 per cent as per NCRB, 2022) of the accidents⁸. The Govt. of India states that the cost of the fatality accounts for 3.4 percent of the GDP in term of

human capital. Economically weaker sections and lower-middle income groups are of highly vulnerable because of the road fatalities and disabilities⁹ (TRW, Gol, 2022). India *"has 1 per cent of the world's vehicles but accounts for 11 per cent of all road crash deaths, witnessing 53 road crashes every hour; killing 1 person every 4 minutes"* (DIMTS Ltd. & TRIPP-IIT Delhi, 2023).¹⁰

The *Global Status Report on Road Safety* report (WHO, 2023)¹¹ indicates that largely developing countries and especially pedestrians, cyclists and motorbikes, and the youth and working people are victims of the road crashes. At global level, 15 Road Accident mortalities occur per 100,000 population and the costs of road mobility remains too high. Thus, the WHO states that there is a need for urgent action regarding reduction of road traffic deaths and injuries by 50 per cent by the year 2030. The Govt. of India aims at the global targets regarding reduction of road fatalities and disabilities.

2. Road Accidents and Insurance:

Most of the primary costs can be mitigated through the insurance

mechanism whereby the individual risks get transferred to the insurance company which in turn spreads it over a large number of insured. Various Health and Accident insurances cover these costs directly, while the Third Party Liability insurances of the vehicle/ entity (tort-feasor) that causes the accident provide coverage for death, disability and medical treatment of the accident victims. Financial costs to the family due to the death or disability of the bread-winner, costs of unpaid loans/ debts and loss of livelihood can also be transferred to the insurance mechanism, through Life, Accident and Health insurances, albeit to the extent of the sum insured for which premiums are paid. Losses/ damages to assets/ properties of third parties including the Govt. can also be covered under the Liability part of the Motor insurance. However, in many cases, establishing the direct relationship between the vehicle/ entity causing the accident and quantifying the monetary impact of the accident on the society or the Govt. can be challenging. Again, the process of apportioning blame between both parties can go in loops and circles, leaving some of the

⁶ Traffic Crashes Cost America Billions in 2019, National Highway Traffic Safety Administration (NHTSA) - Agency releases new study examining the cost of motor vehicle crashes, injuries and fatalities (10 January, 2023, Washington DC) - <https://www.nhtsa.gov/press-releases/traffic-crashes-cost-america-billions-2019>

⁷ The Economic and Societal Impact of Motor Vehicle Crashes, 2019 <https://trid.trb.org/View/2100826#:~:text=>

⁸ Accidental Deaths & Suicides in India 2023, National Crime Records Bureau (MHA), Gol (Dec., 2023) - <https://www.ncrb.gov.in/uploads/files/1ADSIPublication-2023.pdf>

⁹ Road Accidents in India 2023 - MoRTH (Transport Research Wing) (December, 2023) - <https://morth.gov.in/sites/default/files/>

¹⁰ Socio-Economic cost of Road Accidents in India, Report by Delhi Integrated Multi-Modal Transit System (DIMTS) Ltd. in association with Transportation Research and Injury Prevention Programme (TRIPP-IIT Delhi) (2023)

¹¹ Global Status Report on Road Safety 2023, WHO - <https://www.who.int/publications/i/item/9789240086517>

residual costs with the society and the Govt.

The success of Motor insurance in managing the post-accident distress situation depends on multiple *ex-post* factors. Management of post-accident care needs to start with appreciating the need for first-aid, early hospitalization and trauma-care, and identifying the appropriate means and route to take the victim to the right hospital. The efficiency of the hospital admission systems including necessity of advance payments, the speed at which investigations are done, the quality of medical care, as well as the treatment costs are critical factors. Speedy completion of accident related formalities by the traffic police, the transport authorities, related local investigation procedures, post-mortem procedures in case of death etc. are other factors that affect the success of post-accident care. Outside the insurance mechanism, one needs to address factors like delays at the executive and judiciary levels.

3. Motor Insurance - The Legal and Insurance Ecosystems:

The Motor Vehicles Act, 1988 regulates all aspects of road transport vehicles including the provisions regarding registration of motor vehicles, control of motor vehicles through permits, licensing of drivers/ conductors, traffic controls, insurance, liability, offences and penalties, etc. Some Motor Insurance

related provisions are also part of the Indian Motor Vehicles Act.

3.1. Motor Insurance and Insurance Regulations:

The contours of the legal ecosystem of insurers in India are defined by the Insurance Act, 1938, the Insurance Regulatory and Development Authority of India (IRDAI) Act, 1999 and a few other insurance specific legislations. Section 32D of Insurance Act, 1938 mandates that *"Every insurer carrying on general insurance business shall ... underwrite such minimum percentage of insurance business in third party risks as may be specified by the regulations"*. Further, Section 105B provides that an insurers that fail to comply with this mandate, would be liable to pay a penalty not exceeding Rs. 25 crores. Some of the steps related to streamlining Motor TP Claims settlement are discussed below:

3.2. Motor Third Party Liability

insurance: However, while regulatory controls on all the major product lines have been relaxed by 2007, by way of an exemption, the rates, terms, conditions and exclusions in respect of Motor Third Party Liability insurance are still tightly controlled by IRDAI. As seen above, Section 146 of the Motor Vehicles Act, 1988 mandates the requirement of insurance on every vehicle using a vehicle in a public place. IRDAI has been constantly monitoring this segment of insurance and taking careful measures for handling the

situation with all the sensitivity that it merits.

3.3. Third-Party Claims: In cases where the insured is at fault for the accident and causes damage to a third party (such as another vehicle, property, or person), the insurance company handles third-party claims. The insurance company investigates the third-party claim, assesses the damages, and settles the claim with the third party or their representatives.

4. Personal Accident Insurance and Life Insurance Policies with Accident coverages:

Personal Accident Policies and Life Policies with accident coverages supplement the Motor Insurance system in covering accidental deaths and disabilities of individuals at a very affordable premium. As regards Accident insurances, ensuring availability, accessibility and affordability have been consistently at the core of all decisions by the Govt. and the Insurance Regulator. However, they look beyond Road Accidents and cover deaths and injuries caused by other accidents as well.

4.1. Personal Accident Policies are offered by General Insurance Companies and Standalone Health Insurance Companies. These cover around 91 crore individuals under some or other form of PA scheme, at reasonable rates.¹²

¹² IRDAI Handbook of Annual Statistics for the year 2022-23

4.2. Individual Life Insurance

Policies and Accident coverages:¹³

All Individual Life insurance policies in India offer an additional accidental death and disability coverage as a rider benefit at very nominal additional premium. As per IRDAI totally 32.84 crores individual life insurance policies are in force with sum insured of Rs 2,00,48,085 crores. Every year 27 crores lives are insured for various sums insured under group insurance policies. In the year 2022-23 under death claims of life insurance both individual and group a total of Rs 45,794 crores has been paid. There is no bifurcation available for accident related claims and specifically road accidents.

4.3. Pradhan Mantri Suraksha

Bima Yojana (PMSBY) Pradhan

Mantri Jeevan Jyoti Bima Yojana

(PMJJBY): These are two Govt.

initiated insurance schemes, from 2015, which have since covered large number of people for Personal Accident and Life Insurance cover at very affordable premium. The premium under PMSBY for a Personal Accident cover of Rs 2 lakh was initially offered for an annual premium of Rs 12 and now for Rs 20. The Life insurance cover of Rs 2 lakh under PMJJBY was offered at an annual premium of Rs 330 initially which is now increased to

Rs 436. Policyholders should be having a savings bank account and the premium will be auto debited every year subject to consent. Mass insurance coverage has received a huge boost with these Central Govt. Insurance Schemes and succeeded in providing succour to accident victims and their families.

4.4. The Awareness, Psychology and Diligence of the Passenger:

The moot point among all this is lack of awareness and a fatalistic attitude which is resulting in this sort of scenario. Another weak link observed in this scheme is the facility of nomination. An example can be seen in the popular Indian Railway Catering and Tourism Corporation (IRCTC) Scheme for Railway passengers (Annexure 'A'). Once a railway ticket is booked from IRCTC and an insurance cover is purchased, insurance companies send a link to the mobile number of insured passenger to nominate a person under the insurance policy. However, it is observed that most passengers ignore this simple activity which quickly facilitates settlement of claim in the unfortunate event of accident. Collectively, the insurance industry needs to act on such issues more imaginatively and proactively.

5. Road Accidents - Insurance related Data:

IRDAI, GI Council, and IIB are the main sources of data related to insurance in India.

5.1. The General Insurance Council¹⁴

points out that Motor TP rates are administered by IRDAI and that these are reviewed on a periodical basis.

5.2. Efficiency Constraints of the Motor Third Party Liability Insurance System:

The efficacy of this insurance system is plagued by two major issues. (a) poor coverage of Insurance and high number of uninsured vehicles, (b) the large pendency in MACT cases, (c) delays and complexities in claim settlement, (d) low and delayed compensations, (e) uninsured vehicles, and so on.

6. The Vision Zero Concept of Road Safety:

Vision Zero has Road Safety and Industrial safety dimensions.¹⁵

6.1. The Road Safety Dimension:

In 1997, around 180 years after the Vision Zero concept was created by Du Pont, it got revived as a road traffic safety project to achieve a roadway system with no fatalities or serious injuries involving road traffic in Sweden. The importance of saving lives and preventing injuries gathered importance over the amount

¹³ ibid

¹⁴ 4.4. Motor Third Party – Yearbook, General Insurance Council - <https://www.gicouncil.in/yearbook/2021-22/indian-non-life-insurance-industry-analysis/section-04-segmentwise-business-highlights/motor-third-party-tp/>

¹⁵ Vision Zero: Ruminations on the Role of the Insurance Industry, Dr. George E Thomas, The Journal of Insurance Institute of India Since 1974 Volume July - September 2023 - <https://www.insuranceinstituteofindia.com/documents/d/college-of-insurance/iii-the-journal-july-sept-2023-wb>

of money spent on decreasing road risks.¹⁶

6.2. Collaborative Ownership:

The Vision Zero concept was soon adopted in different countries and the movement is widely credited for reducing accidents and deaths on roads to a large extent. Vision Zero was adopted in the USA in 2000 and soon governments, corporations, communities, and all the stakeholders of the roadway network have collaborated variously in making the roads safer in 50 jurisdictions of the country.

6.3. Non-Compromising Approach:

'Vision Zero' is a global non-profit campaign that wants to achieve nothing less than zero traffic-related fatalities and injuries among all categories of road users whether they are drivers, passengers, cyclists, and pedestrians. The Vision Zero movement does not accept any situation where people get killed or injured while in travel and/or the transportation system. It wants system designers and policymakers to be responsible to ensure that travel is safe.

6.4. Vision Zero and Policy Level

Changes: The Vision Zero movement

has three priorities¹⁷ that require policy level changes. These are discussed below:

6.4.1. Managing Speed can be done variously - by safer streets, lower speed limits, automated speed enforcement, and harsh punishment for non-compliance.

6.4.2. Centering Equity would include locating areas (and communities) that are affected by traffic deaths and injuries, and making roadway safety investments a priority in such areas.

6.4.3. Engaging Community emphasizes the importance of supporting everyone including community based organizations to work more effectively with residents.

6.5. Vision Zero works on 4

Principles: These are (i) Life is not negotiable, (ii) People make mistakes, (iii) The ability to cope with physical and mental pressure is crucial, and (iv) Situational prevention comes first¹⁸. Vision Zero initiatives have been adopted by many countries. Many urban areas in the USA including New York City, Los Angeles, and Ore, some local Govt.s and around 40 communities have been successful in reducing roadway

fatalities¹⁹ by implementing various measures like not allowing cars in major commercial areas of the city, and making speed restrictions on some slow streets. Some of these have saved thousands of lives from road accidents. The lower accident rates will reduce premiums for consumers in the long run.

6.6. Vision Zero for Insurers: The implementation of Vision Zero can be examined from an insurance point of view.²⁰ This would include (i) taking leadership and demonstrating commitment, (ii) identifying hazards and controlling risks, (iii) defining targets and developing safe and healthy systems (iv) ensuring safer machines, equipment and workplaces, (v) investing in people, and improving competence to bring about a better culture of safety by promoting safe driving practices, advocating for better road infrastructure, incentivizing safe driving behaviour, supporting pedestrian and cyclist safety, and advocating for policy changes that improve road safety. (vii) Insurers need to share information and data as well. A Vision Zero study²¹ indicates that loss data can reveal

¹⁶ What Is Vision Zero? Overview and Effectiveness- <https://www.treehugger.com/what-is-vision-zero -6828484>

¹⁷ A Primer on Vision Zero https://visionzeronetwork.org/wp-content/uploads/2018/05/What-is-VZ_FINAL.pdf

¹⁸ Vision Zero: Ruminations on the Role of the Insurance Industry, Dr. George E Thomas, The Journal of Insurance Institute of India Since 1974 Volume July - September 2023 - https://www.insuranceinstituteofindia.com/documents/d/college-of-insurance/iii_the-journal-july-sept-2023wb

¹⁹ Reducing Traffic Fatalities and Injuries through Vision Zero - Max Dorfman, Research Writer, Triple-I <https://www.iii.org/insuranceindustryblog/reducing-traffic-fatalities-and-injuries-through-vision-zero/>

²⁰ Vision Zero: Role of Insurance in Achieving Safer Roads - <https://www.indiaonroad.com/2023/04/vision-zero-role-of-insurance.html>

²¹ 'Why the Insurance Industry Needs a Seat at the Road Safety Table', Kat Krieger, CMO, Together for Safer Roads - <https://medium.com/vision-zero-cities-journal/why-the-insurance-industry-needs-a-seat-at-the-road-safety-table-5b089b63ebff>

the magnitude of the risks, the actual impact of losses, along with the frequency and the severity of losses. A truck accident can be seen from a road design perspective, a vehicle design perspective, the driver's perspective, the lack of lighting on the road, the visibility at turning points, the lack of sleep of the drivers, drunk driving, medical and emotional conditions of drivers, unruly pedestrian or animal movement, etc. By using telematic devices insurers can collect and analyse data on track driver behaviour such as speed, acceleration, and braking, contributing immensely to road safety.²²

7. Solutions Implemented by the Govt. in the Recent Past:

In response to the findings of the Report on Socio-Economic cost of Road Accidents in India by DIMTS Ltd. & TRIPP-IIT Delhi (discussed earlier), and a few other studies that had been done over the last decade, the Ministry of Road Transport and Highways (MoRTH) formulated diverse strategies to address road safety based on Education, Road and Vehicle Design, Enforcement and Emergency Care. The various initiatives taken accordingly, by the Ministry are detailed below:

7.1. Education: For improving public awareness on road safety, MoRTH undertakes various awareness campaigns through social, electronic and print media. MoRTH provides

financial assistance to various agencies for Road Safety advocacy.

7.1.1. MoRTH observes National Road Safety Month/ Week for spreading road safety awareness.

7.1.2. MoRTH conducts a Course on Road Safety Audit which is compulsory for key technical staff under the Ministry up to the level of Superintending Engineer or equivalent.

7.1.3. MoRTH runs Institutes for Driving Training & Research (IDTRs), Regional Driving Training Centres (RDTCs) and Driving Training Centres (DTCs) at various level across the Country.

7.2. Road Engineering: Road safety was made an integral part of road design at planning stage and made some initiatives for road owning agencies under the Ministry.

7.2.1. MoRTH mandated Road Safety Audit (RSA) of all National Highways (NHs) through third party auditors/ experts at all stages i.e. design, construction, operation and maintenance etc.

7.2.2. MoRTH designated Road Safety Officers (RSO) at Regional Offices to look after RSA, rectification of Black Spots and other road safety matters.

7.2.3. MoRTH accorded high priority for identification and rectification of Black Spots and accident spots on NHs. 5352 Black Spots were

identified on NHs from 2016-2018 data.

7.2.4. 130 stretches of NH were located for development as Model Safe Roads under the Ministry.

7.2.5. 85 project stretches of NH were located for conversion to Model Safe Construction Zone under the Ministry.

7.2.6. MoRTH administers the electronic a Detailed Accident Report Project to create a central repository of road accidents data across the Country.

7.2.7. MoRTH and the Indian Roads Congress (IRC) have issued various codes and guidelines, time to time, to implement various road safety measures to minimize accidents on the NHs.

7.3. Vehicle Engineering: The Ministry notified the following:

7.3.1. Mandatory provision of an airbag for the passenger seated on the front seat of a vehicle, next to the driver.

7.3.2. Norms for safety of children below 4 years of age, travelling on a motor cycle. It specifies using safety harness, crash helmet and restricts speed.

7.3.3. Mandatory fitment of safety technologies for different category vehicles, such as Seat Belt Reminder (SBR) for driver and co-driver, Manual Override for central locking system, Over speed warning system,

²² Why the Insurance Industry Needs a Seat at the Road Safety Table <https://medium.com/vision-zero-cities-journal/why-the-insurance-industry-needs-a-seat-at-the-road-safety-table-5b089b63ebff>

Reverse Parking Alert System, Mandated Anti-Lock Braking System (ABS), etc.

7.3.4. Mandatory checks for protecting occupants in case of Offset Frontal Collisions, Head-on collision, Lateral Collision etc., and for protection of pedestrians and road users in the event of a collision with motor vehicles.

7.3.5. Mandatory compliance regarding fire detection, alarm and suppression systems. School buses were mandated to have fire alarm and protection system in the occupant compartment.

7.4. **Enforcement:** The MV Act, 2019 provides for enhancing deterrence for violation of traffic rules and strict enforcement through use of technology. It specifies provisions for placement of electronic enforcement devices such as speed camera, closed-circuit television camera, speed gun, body wearable camera, dashboard camera, Automatic Number Plate Recognition (ANPR), etc.

7.5. **Emergency care:** Ministry provided for the protection of Good Samaritans, who voluntarily and without expectation of any reward/compensation render emergency assistance at the accident scene to the victim or helps in transporting victims to the hospital.

7.5.1. Ministry increased the compensation of victims of Hit and Run motor accidents (from Rs. 12,500 to Rs. 50,000 for grievous hurt and from Rs. 25,000 to Rs. 2,00,000 for death).

7.5.2. Provisions were made for ambulances with paramedical staff/ Emergency Medical Technicians/ Nurses at toll plazas on National Highways.

8. The Search for Solutions Continues:

It is understood from various literature and interactions with insurance experts that from time to time, there have been various initiatives by the Govt. focussed on improving the situation. In the recent past also, enablement was witnessed through changes in the Motor Vehicle Act provisions and changes in Insurance related norms. However, there is scope and reason for doing more for Road Accident victims especially in emerging economies. Contributions to the cause in the form of innovative ideas, process changes, improvements in *ex-ante* mechanisms etc. are welcome from legal specialists, social scientists, economists, the scientific community and academicians.

8.1. Viable and Out-of-the-Box Solutions for Comprehensive Accident Management

8.1.1. **Data-Driven Monitoring with AI & IoT:** AI-based traffic management systems can be used to monitor high-risk zones and regulate vehicle speed in real-time. IoT-enabled wearables for drivers help to track fatigue, alcohol levels, and sudden health emergencies.

8.1.2. **Smart Infrastructure:** Introduce smart signals and sensor-enabled speed breakers on accident-

prone roads. Install solar-powered road markers with dynamic lighting for better night-time visibility.

8.1.3. Behavioural Change

Programs: Conducting compulsory driver re-training every 5 years focusing on behavioural psychology and emergency handling. Launching school-level campaigns to build a culture of responsible driving from a young age.

8.1.4. Post-Accident Response:

Ensuring Timely Assistance: This can include Drone-Assisted First Response by using drones to deliver first aid kits and monitor accident sites remotely until ambulances arrive. Drones can guide rescue teams with live surveillance and GPS data.

8.1.5. Mobile Accident Reporting

Platforms: Creating user-friendly mobile applications for on-the-spot accident reporting, and linking directly with hospitals/ insurance providers. Crowdsourcing emergency assistance through location-based alerts to nearby motorists and pedestrians.

8.2. Policy Recommendations for Sustainable Accident Management:

8.2.1. Public-Private Partnerships

(PPP): Collaborating with tech companies for AI and IoT deployment in traffic monitoring systems. Engaging with insurance firms and corporates in road safety awareness campaigns.

8.2.2. Integrated Trauma Care

Networks: Developing regional trauma networks by linking hospitals,

ambulance services, and emergency responders for efficient patient transfer. Mandating installation of basic life support equipment in public and commercial vehicles.

8.2.3. Accident Data Management System (ADMS): Establishing a national-level Accident Data Repository to analyse patterns, track accident hotspots, and facilitate real-time reporting.

8.2.4. Remedying Medico Legal Systems (Expeditious Relief): Ensuring speedy and timely treatment – Legal protection to Doctors, Rescuers from harassment. Dealing effectively with vested interests elements that seek to prolong the legal process by setting the time limits

8.3. Progressive Judicial Reforms – Initiatives - Outcomes - Suggestions from the Judiciary: Some of the ideas/ rules from the judgements by the Delhi High Court in the case of Rajesh Tyagi v. Jaibir Singh²³ for the speedy settlement of motor vehicle accident claims are worth referring to. Based on the suggestions from the Justice J R Midha²⁴ of the Delhi High Court, since approved by the Supreme Court of India, various reforms were introduced in the

scheme of adjudication of motor crash claims.

8.3.1. Accordingly claimants can get compensation within 120 days of the crash. The Motor (Accidents) Claims Tribunal Agreed Procedure should be implemented through the Motor Accident Claims Tribunals in coordination with the Legal Service Authorities (LSA) and the Director General of Police (DGP) of the States.

8.3.2. The High Court formulated the MACAD Scheme for ensuring disbursements of compensation and its receipt by victims/ their kin. Additionally, the Court directed 21 banks to appoint nodal officers for implementing the Scheme in coordination with the LSAs and the DGP of the respective States.²⁵

8.3.3. The Supreme Court²⁶ noted that “there was no proper implementation of the Claims Tribunal Agreed Procedure (MCTAP) by the Claims Tribunals at all India level in terms of the directions of the Supreme Court” and directed the National Legal Services Authority (NALSA) to take up the matter and monitor it same in coordination and co-operation with the various High Courts. The Court advised State Judicial Academies to sensitize

the Presiding Officers of Claims Tribunals, Senior Police Officers and Insurance Companies for implementing the MCTAP.

8.4. By way of a synthesis of various studies, the following six policy recommendations²⁷ are felt worthy to be taken note of:

8.4.1. Comprehensive implementation of MCTAP.

8.4.2. Issuance of Notification under MVA, 2019 to standardize protocols between MACT, police and Insurance companies.

8.4.3. Mechanism of Interim Compensation

8.4.4. Ensuring coordination between Motor Accident Mediation Authority, State Road Safety Council, State LSA

8.4.5. Increasing awareness about MCTAP/ other compensation systems using dedicated helplines

8.4.6. Adding Technology to ensure Insurance Coverage by enhancing accessibility/ affordability

9. Summary & Conclusions:

It is indeed heart-warming that despite the delays in implementation, the clear and reasonably progressive legal provisions from multiple

²³ Rajesh Tyagi & Ors. vs Jaibir Singh & Ors. on 12 May, 2021, Delhi High Court - <https://indiankanoon.org/doc/89906340/>

²⁴ Justice J. R. Midha's Landmark Judgments, National Law University, Delhi - <https://nludelhi.ac.in/research/hmj-j-r-midhas-landmark-judgments/>

²⁵ Jai Prakash Vs. M/S. National Insurance Co. SLP (C) No 11801-11804/2005; M.R. Krishna Murthi vs. The New India Assurance Co. Ltd., SLP (C) No 31521-31522/ 2017.

²⁶ Supreme Court in its judgment dated 5th March 2019 in the case of M. R. Krishna Murthi vs. The New India Assurance Co. Ltd., SLP (C) No 31521-31522 of 2017

²⁷ World Bank- Save Life Foundation Report of 2021- <https://documents1.worldbank.org/curated/en/761181612392067411/pdf/Traffic-Crash-Injuries-and-Disabilities-The-Burden-on-Indian-Society.pdf>

agencies, including the Indian judiciary, have helped immensely in improving Road Accident relief. Today, the victim has to prove only that he was injured by the conduct of a vehicle user irrespective of violations of the law. However, the job of reducing the *incidence of road fatalities and disability burden* (IRFDB) of the society at a Vision-Zero level of adequacy, keeps eluding the society. Accident victims continue to face faster vehicles, more accelerator happy drivers, more insensitive people who are in a hurry, high degrees of social and medical apathy, and many other harsh realities of life.

In line with the thoughts of Peter Huber, one finds that many of the Courts lack of expertise, inadequate staff, and ill-suited procedures may lead to negative effect to discovery of scientific truth²⁸ making them incompetent in matters concerning technical issues of health and safety.

In addition to the *ex-ante* approach of transferring risk to the insurance mechanism, there is room for several other *ex-ante* requirements, especially in the areas of behavioural change - sensitizing people and communities. Improvements are needed from technology in accident-proofing vehicles and roads, social conditioning for reducing toxic torts arising from drunken and irresponsible driving practices, better value systems and stricter laws to

check medical/ hospital malpractice, making the police and the executive more responsible and making the judiciary more sensitive, responsive and accountable. To make the *ex-post* situations better, we need to have more efficient laws and regulations to reduce tort, organized fraud, and lackadaisical approaches of those in power.

The matter still remains work in progress and there is lots more that needs to be done to improve the lives of people and families affected by Road Accidents. Increasing public awareness about the importance of comprehensive insurance and the possibilities of providing bundled services like merging personal injury insurance with vehicle registration, would help in ensuring better financial security. Data analysis can help in

identifying the determinants that reduce IRFDB and motivate further research in this direction. Insights into the significance of the determinants can also help in designing incentives for changing societal behaviour leading to a reduction in road fatalities and disabilities in India. The presenters of this paper seek the support of the various academic and professional stakeholders from law, economics and technology to contribute their ideas in improving the situation for the common man in India. We are sure that the work done would help reduce the sufferings of mankind elsewhere in the world as well.

Keywords: *Road Accidents, Road Crashes, Vehicles, Regulation, Insurance, Compensation, Vision Zero.*

Annexure A

Insurance of Railway Passengers who purchased tickets through the Indian Railway Catering and Tourism Corporation (IRCTC) Portal - A Case Study of the Balasore Train Accident: [This case study from a Rail Accident is highly relevant for Road Accidents as well.]

IRCTC provides Personal Accident Insurance to passengers who book train tickets through its portal. In 2023-24, this insurance was costing just 35 paise for a cover of Rs 10 lakh in case of accidental death during the journey, and other benefits as given below:

Accidental Death	Permanent Total Disability	Permanent Partial Disability	Hospitalization expenses for Injury	Transportation of Mortal Remains
Rs. 10 lakhs	Rs. 10 lakhs	Rs. 7.5 lakhs	Rs. 2 lakhs	Rs. 10 thousand

²⁸ Liability: The Legal Revolution and its Consequences, P. Huber, New York, Basic Books, 1988. Quoted in Ackerman, n.57,p.122

Though 27.63 crores travellers were insured under this scheme²⁹ during the year, and 624 travellers in the ill-fated trains had opted for the Insurance cover, when the Shalimar - Chennai Coromandel Superfast Express, the Howrah-Yesvantpur Superfast Express and a goods train collided with one another in Balasore on June 3, 2023, killing 288 passengers and injuring more than 1000, ironically, only 22 claims were lodged. While 2 of these were for permanent total disability (PTD), 15

for permanent partial disability (PPD) and 5 for hospitalisation expenses, no death claim was lodged under the Scheme. IRDAI repeatedly held meetings with all insurers involved, circulated the names of the insured passengers and advised insurers to start the claims process *suo moto*. Insurers were advised to appoint designated claim settlement officials, publish the details of claims settlement offices/ camps on websites, media and other channels, launch awareness campaigns, and

publish management information systems (MIS) details, in an attempt to locate the claimants and get the claims settled expeditiously. 

This case study about the ground level reality, emphasizes the importance of insurance awareness in ensuring that laws, regulations and welfare measures are actually enjoyed by the intended beneficiaries – the accident victims and their relatives.

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²⁹ Odisha train accident: Only 22 claims under IRCTC insurance, Odisha Post, 27 June 2024 <https://www.orissapost.com/odisha-train-accident-only-22-claims-under-irctc-insurance>

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

1)

2)

3)

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

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.....
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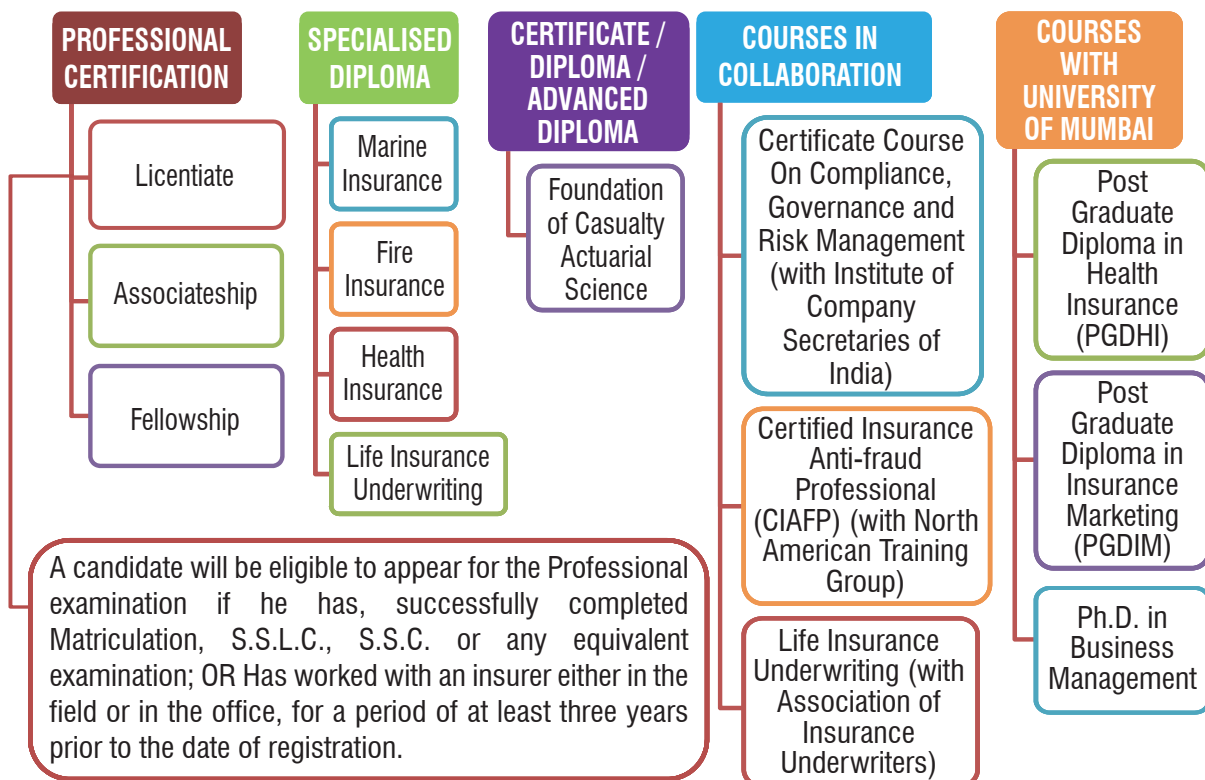
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