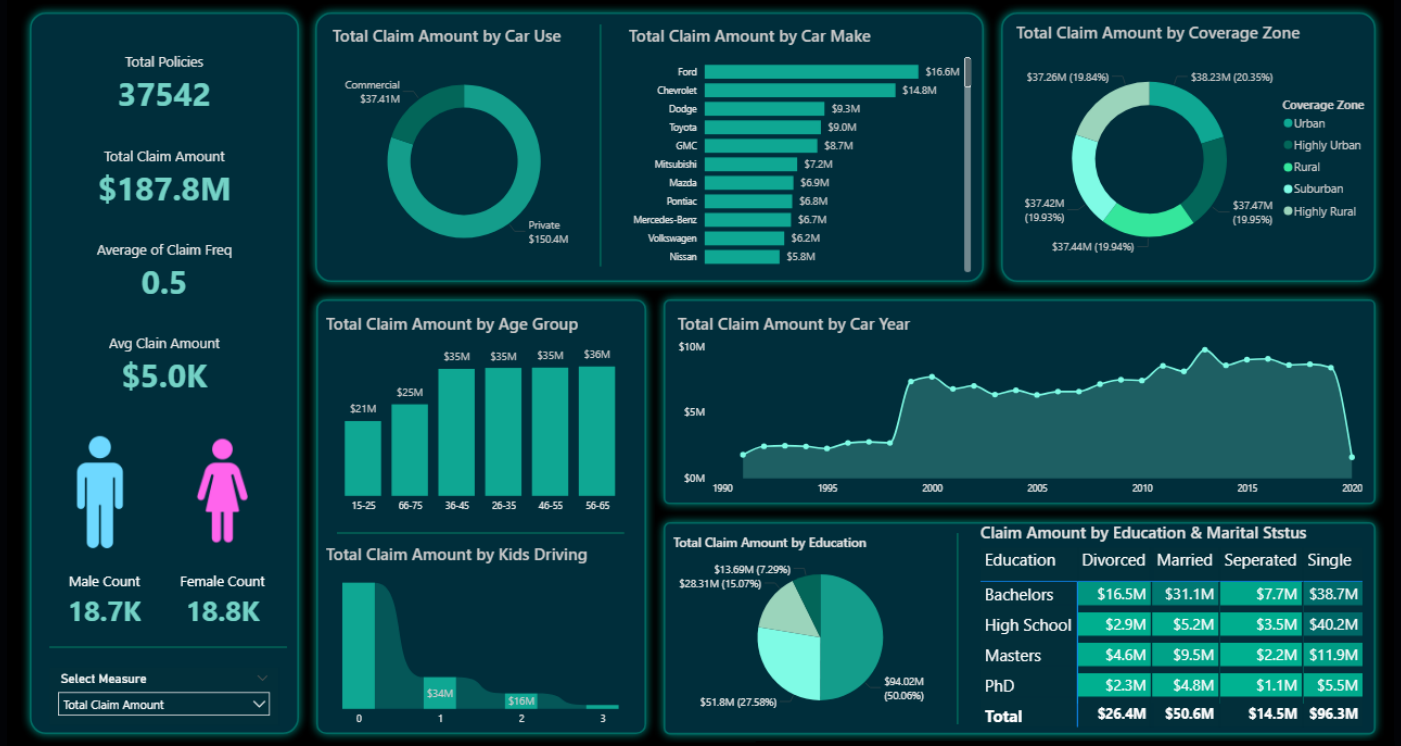
Insurance Risk & Claims Analysis Power BI Report



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https://github.com/KumarBoste/Insurance_Risk_And_Claims_Analysis

1. Project Objective

The objective of this project is to analyze insurance risk and claim patterns using historical policy and claims data.
The dashboard aims to:

- Understand claim distribution across demographics, vehicles, and regions
- Identify high-risk segments contributing to higher claim amounts
- Support data-driven decision-making for underwriting, pricing, and risk management
- Improve future loss prevention strategies using actionable insights

2. Problem Statement

Insurance companies face challenges such as:

- Rising claim costs
- Difficulty in identifying high-risk customers and vehicles
- Uneven claim distribution across age groups, regions, and policy types
- Limited visibility into how education, marital status, and driving behavior impact claims

This project addresses the following key questions:

1. Which car usage type contributes most to claims?
2. Which car makes and manufacturing years show higher risk?
3. How do age groups and driving behavior influence claim amounts?
4. Does education level and marital status impact claim severity?
5. Which coverage zones are more prone to high claims?

3. Data Visualization & Insights

Key KPIs

- Total Policies: 37,542
- Total Claim Amount: $187.8M

- Average Claim Frequency: 0.5
- Average Claim Amount: $5,000
- Gender Distribution:
    - Male: 18.7K
    - Female: 18.8K

3.1 Claim Amount by Car Use

- Private vehicles: ~$150.4M
- Commercial vehicles: ~$37.4M

Insight:
Private vehicles contribute the majority of claims, indicating higher exposure due to frequent usage.

3.2 Claim Amount by Car Make

- Top contributors:
    - Ford – ~$16.6M
    - Chevrolet – ~$14.8M
    - Dodge, Toyota, GMC follow closely

Insight:
Popular mass-market brands show higher claim amounts due to larger vehicle populations on the road.

3.3 Claim Amount by Coverage Zone

- Claim distribution is fairly balanced across:
    - Urban
    - Highly Urban
    - Suburban
    - Rural
    - Highly Rural

Insight:
Urban and suburban areas show slightly higher claims due to traffic density and accident probability.

3.4 Claim Amount by Age Group

- Highest claims observed in:
    - 26–35
    - 36–45
    - 46–55 age groups

Insight:
Middle-aged drivers account for the largest claim amounts, likely due to higher vehicle usage and family responsibilities.

3.5 Claim Amount by Car Manufacturing Year

- Significant increase in claims from 2000 onwards
- Peak observed between 2010–2016

Insight:
Modern vehicles show higher claim amounts due to:

- Expensive spare parts
- Advanced technology repair costs

3.6 Claim Amount by Kids Driving

- Policyholders with 1–2 kids driving show noticeably higher claims

Insight:
Young or inexperienced drivers increase accident risk.

3.7 Claim Amount by Education

- Bachelors & Masters holders contribute the highest claim amounts

Insight:
Higher income groups may insure higher-value vehicles, resulting in larger claims.

3.8 Claim Amount by Education & Marital Status

- Married customers generate the highest total claims across all education levels
- Singles and divorced customers show moderate claim amounts

Insight:
Married individuals often have multiple vehicles and family drivers, increasing exposure.

4. Conclusion

The analysis reveals that insurance risk is influenced by multiple interconnected factors such as:

- Vehicle usage type
- Driver age group
- Car make and year
- Driving behavior (kids driving)
- Socio-economic factors (education & marital status)

The dashboard provides a holistic view of claim behavior, helping insurers move from reactive claim handling to proactive risk management.

5. Best Solutions & Recommendations for the Future

1. Risk-Based Premium Pricing

- Higher premiums for:
    - Commercial vehicle usage
    - Families with multiple young drivers
    - High-risk age brackets

2. Targeted Driver Safety Programs

- Defensive driving courses for:
    - Young drivers

- Families with kids driving

3. Vehicle-Specific Policy Adjustments

- Adjust premiums for:
  - High-claim car brands
  - Expensive modern vehicles

4. Regional Risk Mitigation

- Implement region-specific policies in urban and suburban areas
- Encourage telematics-based monitoring

5. Predictive Analytics Integration

- Use historical claim data to:
  - Predict future claim probability
  - Identify fraud patterns
  - Improve underwriting accuracy

6. Customer Segmentation Strategy

- Segment customers based on:
  - Demographics
  - Driving behavior
  - Claim history
    to offer personalized insurance plans