

# SUSEP

## Auto Insurance Analysis

2017-2020

**Alya Alsharakhat**  
**DAB16**



# Agenda

1

Introduction

2

Scenario

3

Approaches

4

Analysis

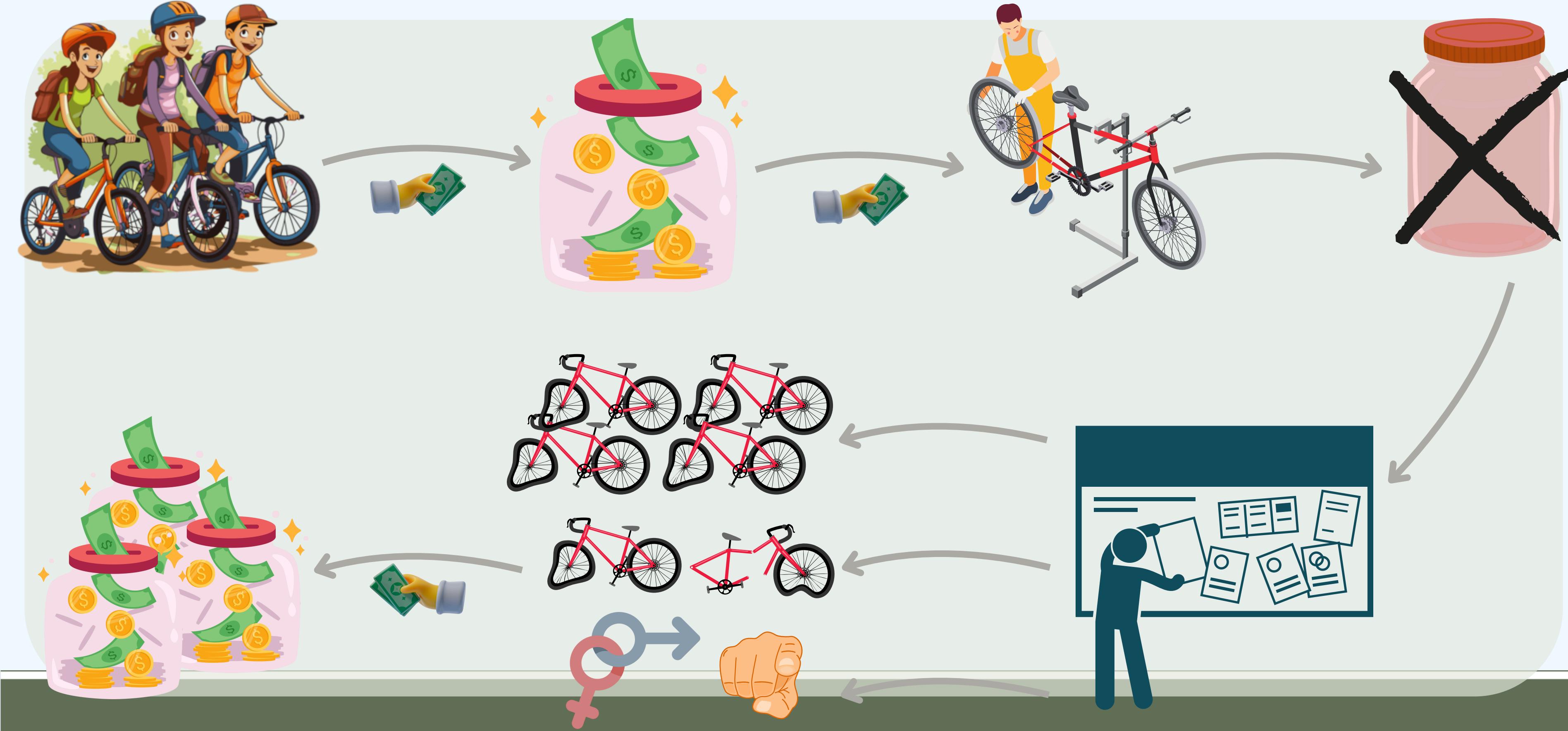
5

Conclusion

6

Recommendations

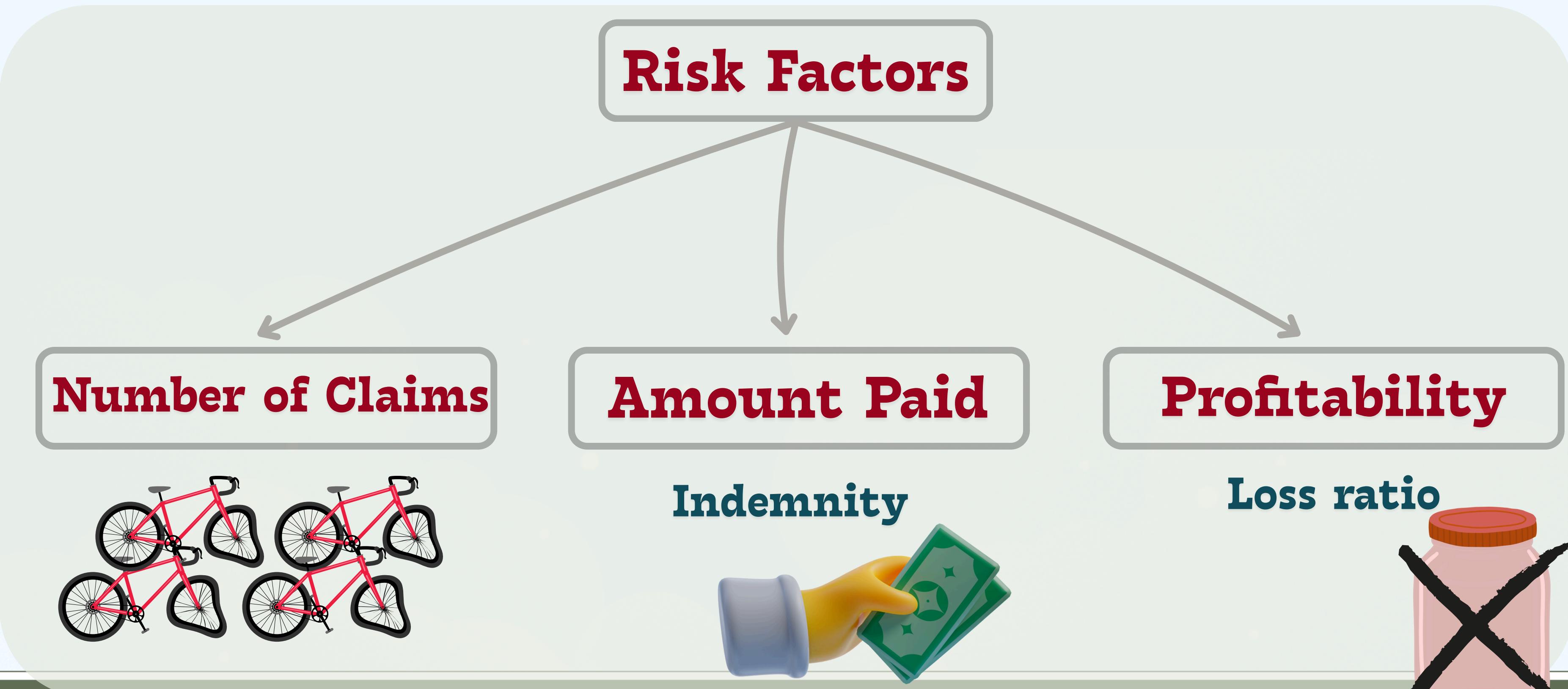
# Introduction



# Scenario

An insurance company in Brazil wants to Improve their underwriting decisions and understand what makes vehicle high-risk using vehicle insurance data from 2017-2020 published by SUSEP, the Superintendence of Private Insurance, which is the Brazilian federal regulatory agency for the insurance, private pension, and capitalization sectors.

# Approaches



# Data Overview

2017-2020

## Number of Claims

17.5M

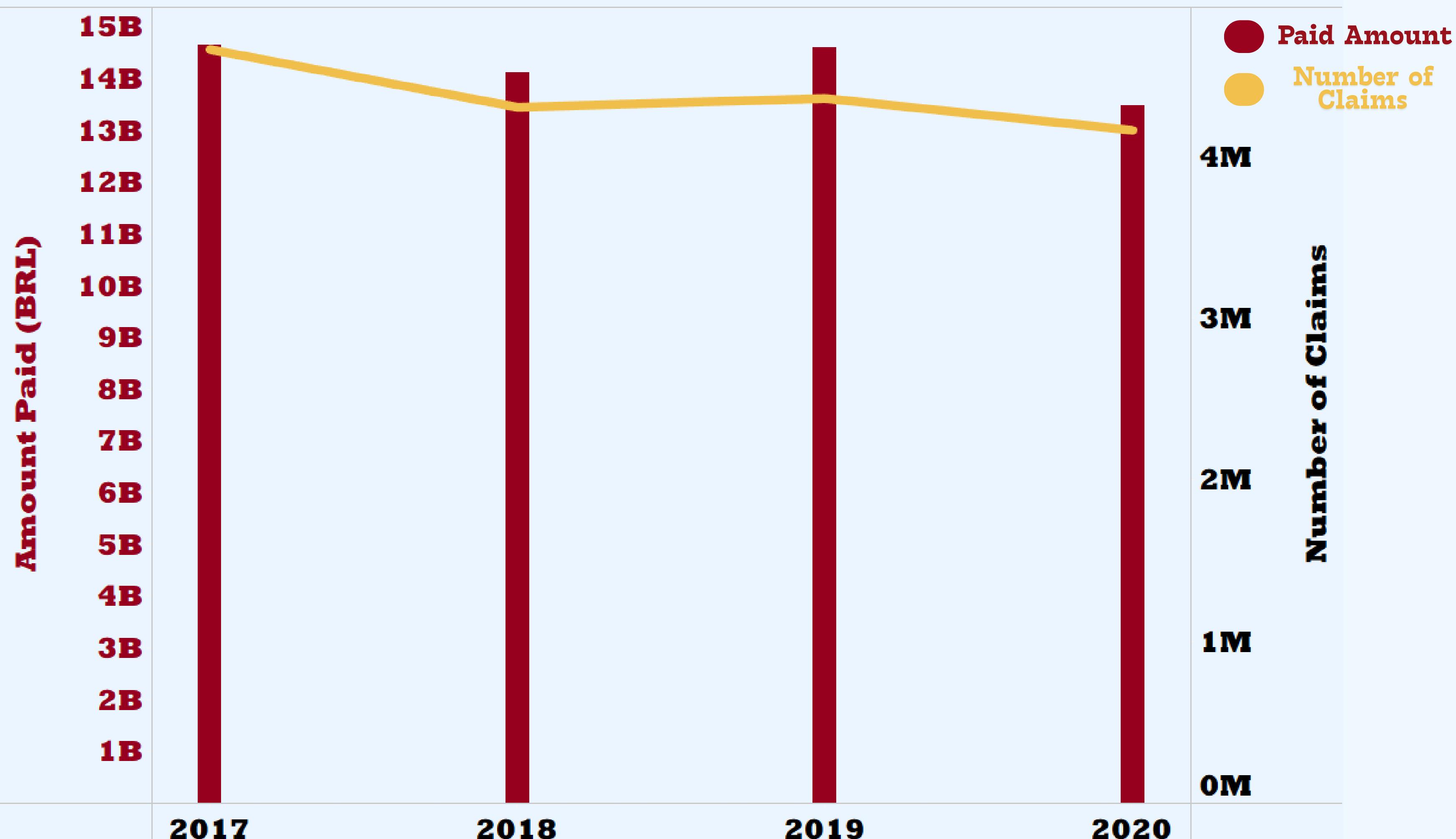
## Total Amount Paid

BRL 56.8B

## Loss Ratio

62.5%

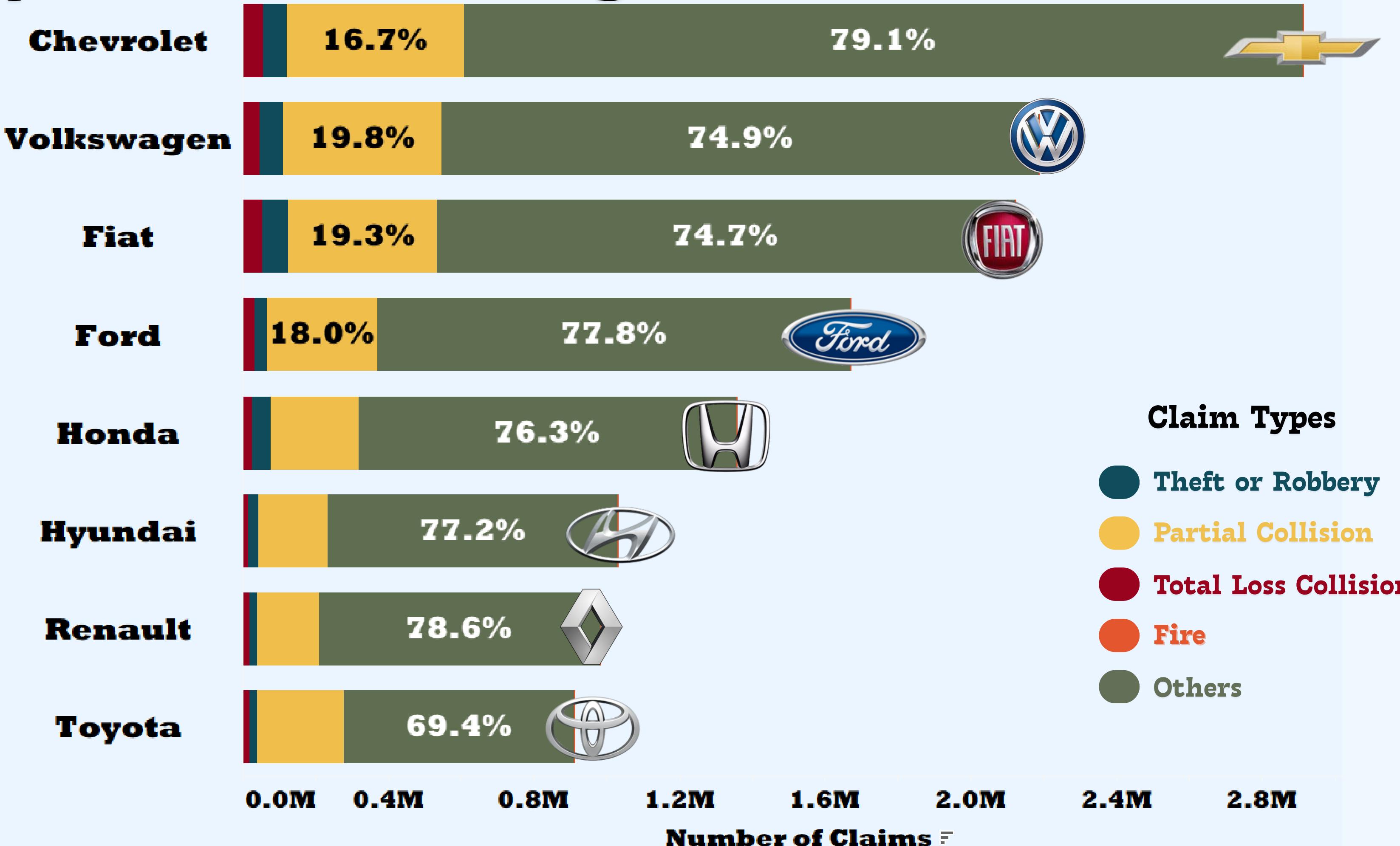
# Paid Amount vs Number of Claims Over Time (2017-2020)



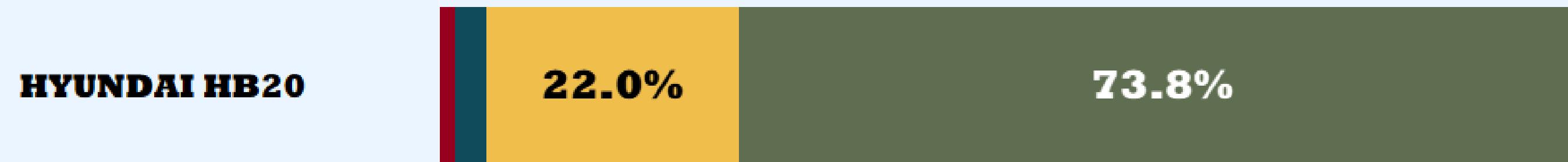
**Number of  
claims**

# Vehicle Features

# Top 8 Vehicle Brands by Total Number of Claim



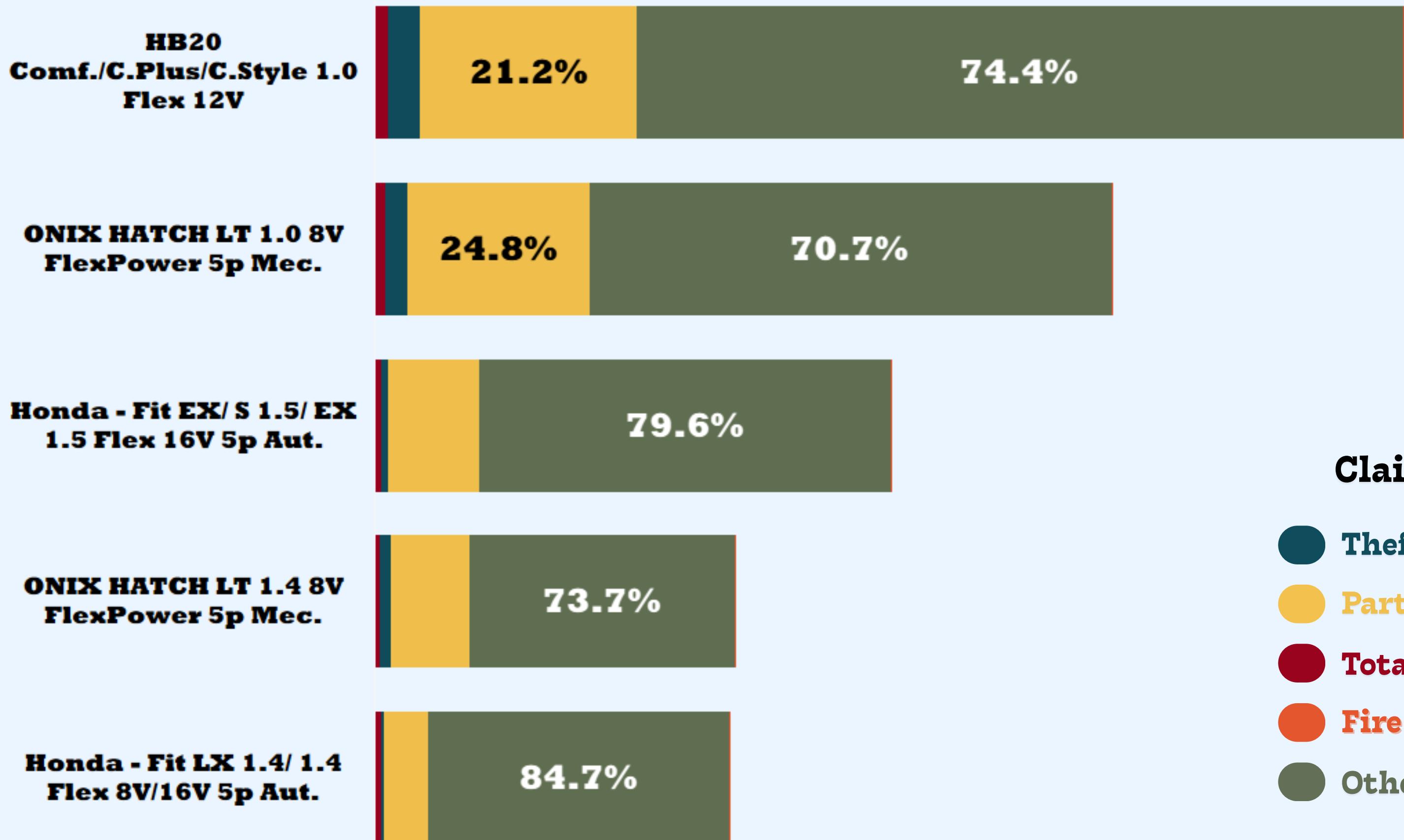
# Top 5 Vehicle Models by Total Number of Claims



0K 100K 200K 300K 400K 500K 600K

Number of Claims

# Top 5 Vehicle Variants by Total Number of Claims



## Claim Types

- Theft or Robbery
- Partial Collision
- Total Loss Collision
- Fire
- Others

0K 20K 40K 60K 80K 100K 120K 140K 160K 180K 200K 220K

Number of Claims

# Number of Claims by Vehicle Category

**Passenger -  
Domestic**

**13.2M**

**Truck**

**3.0M**

**Passenger -  
Imported**

**828.1K**

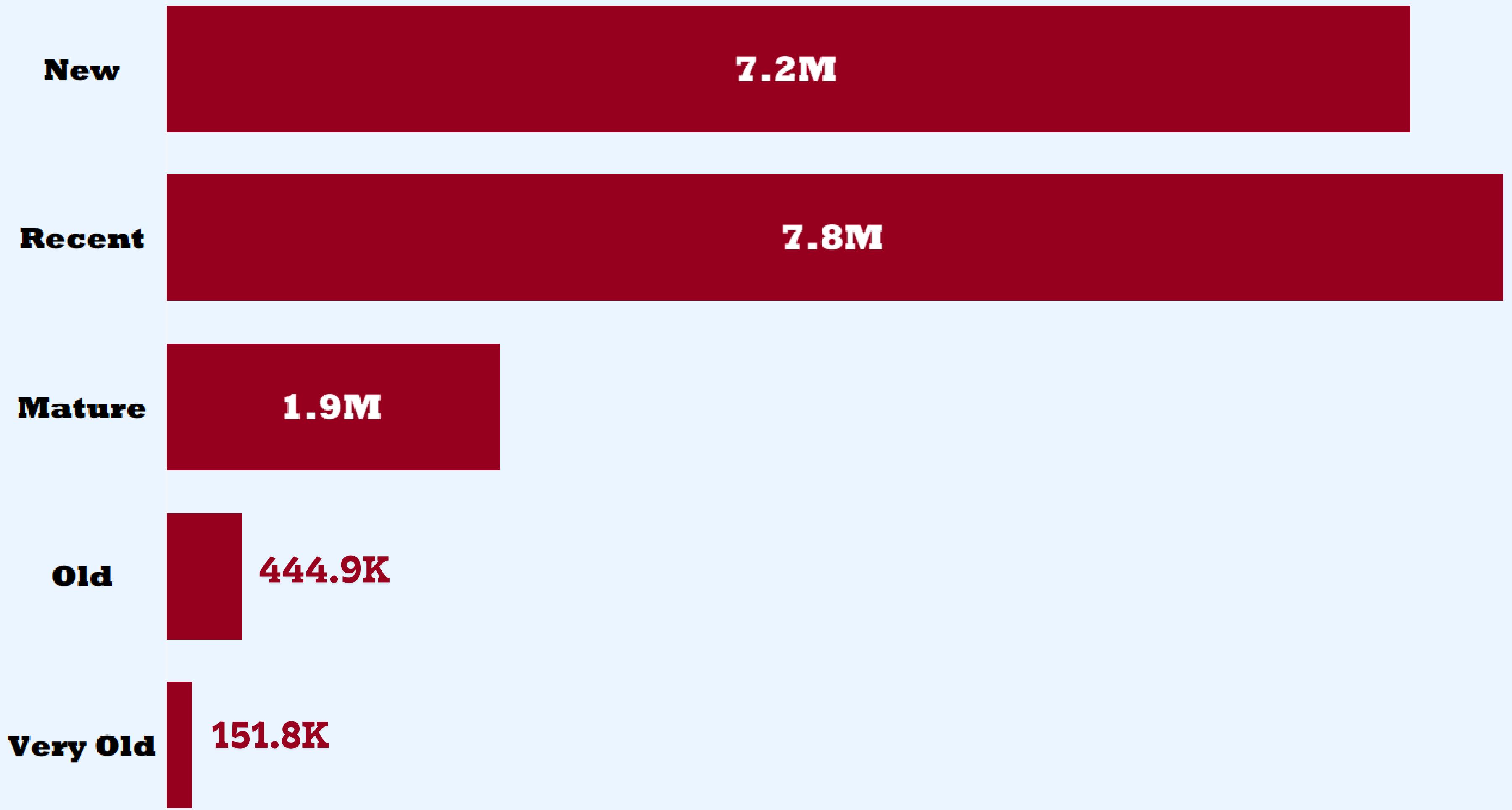
**Motorcycle**

**388.9K**

**Bus**

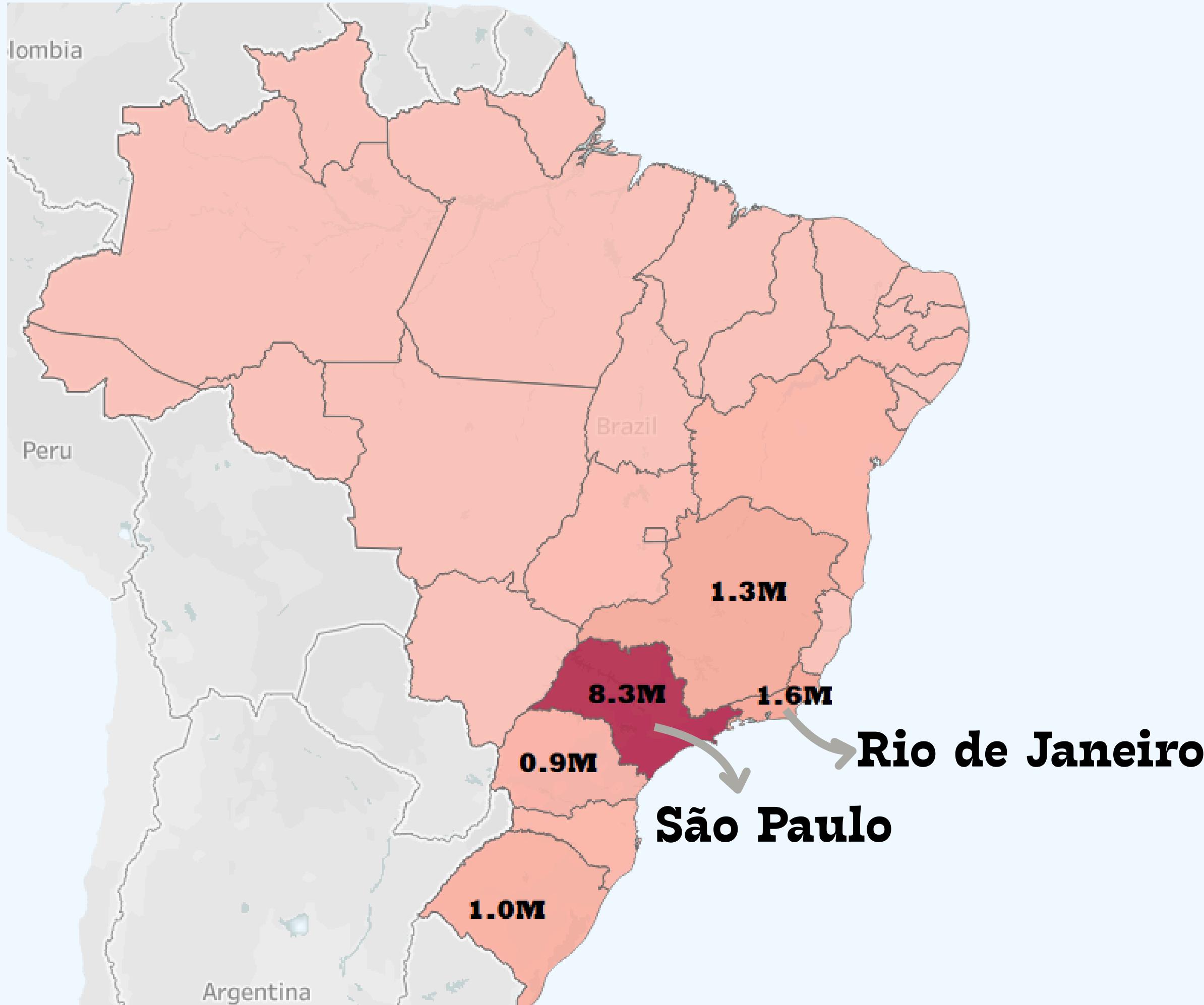
**2.2K**

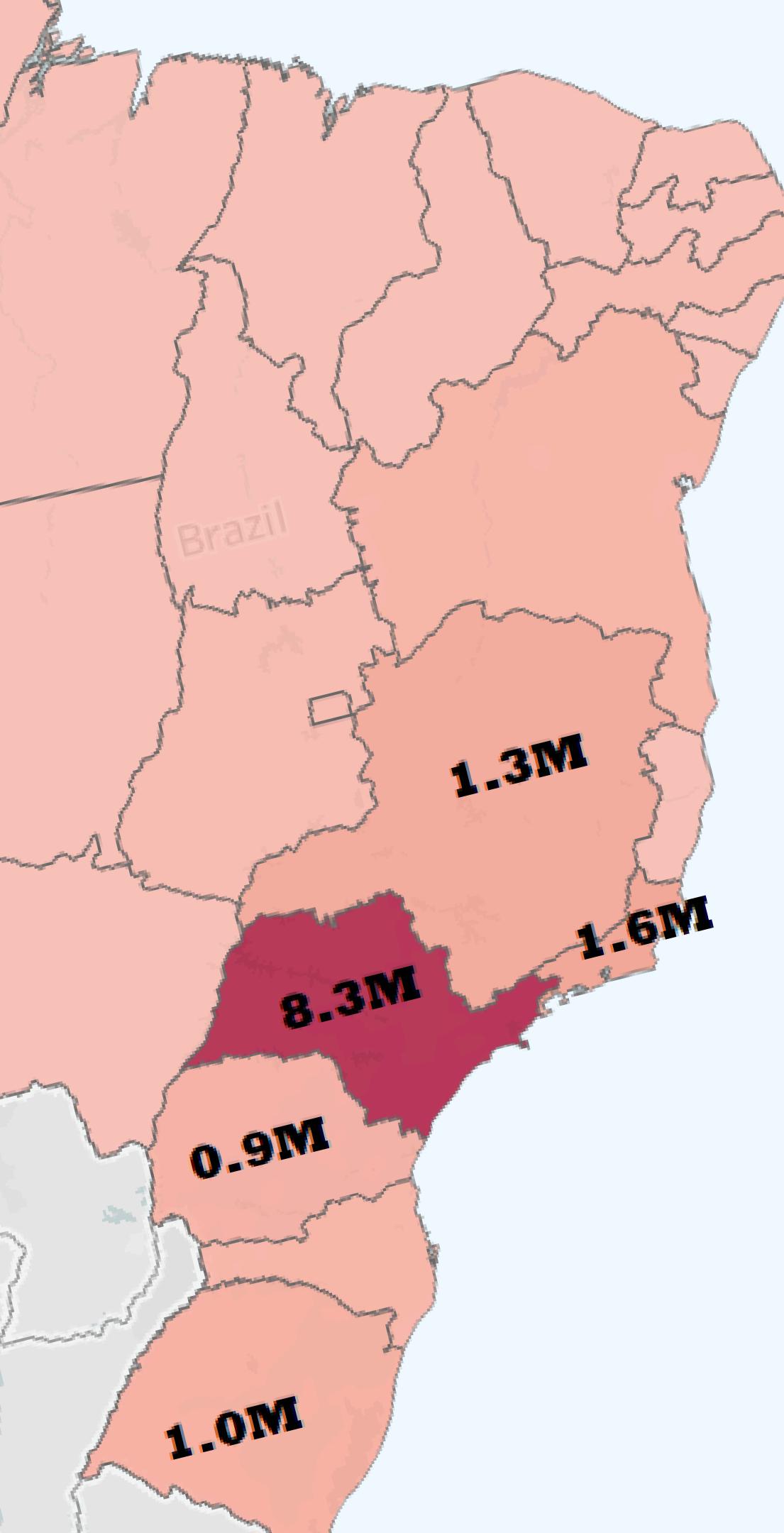
# Number of Claims by Vehicle Age



# Location

# Number of Claims by State





**São Paulo**



**Rio de Janeiro**

# Driver

# Number of Claims by Driver Gender

**Male**

**8.9M**

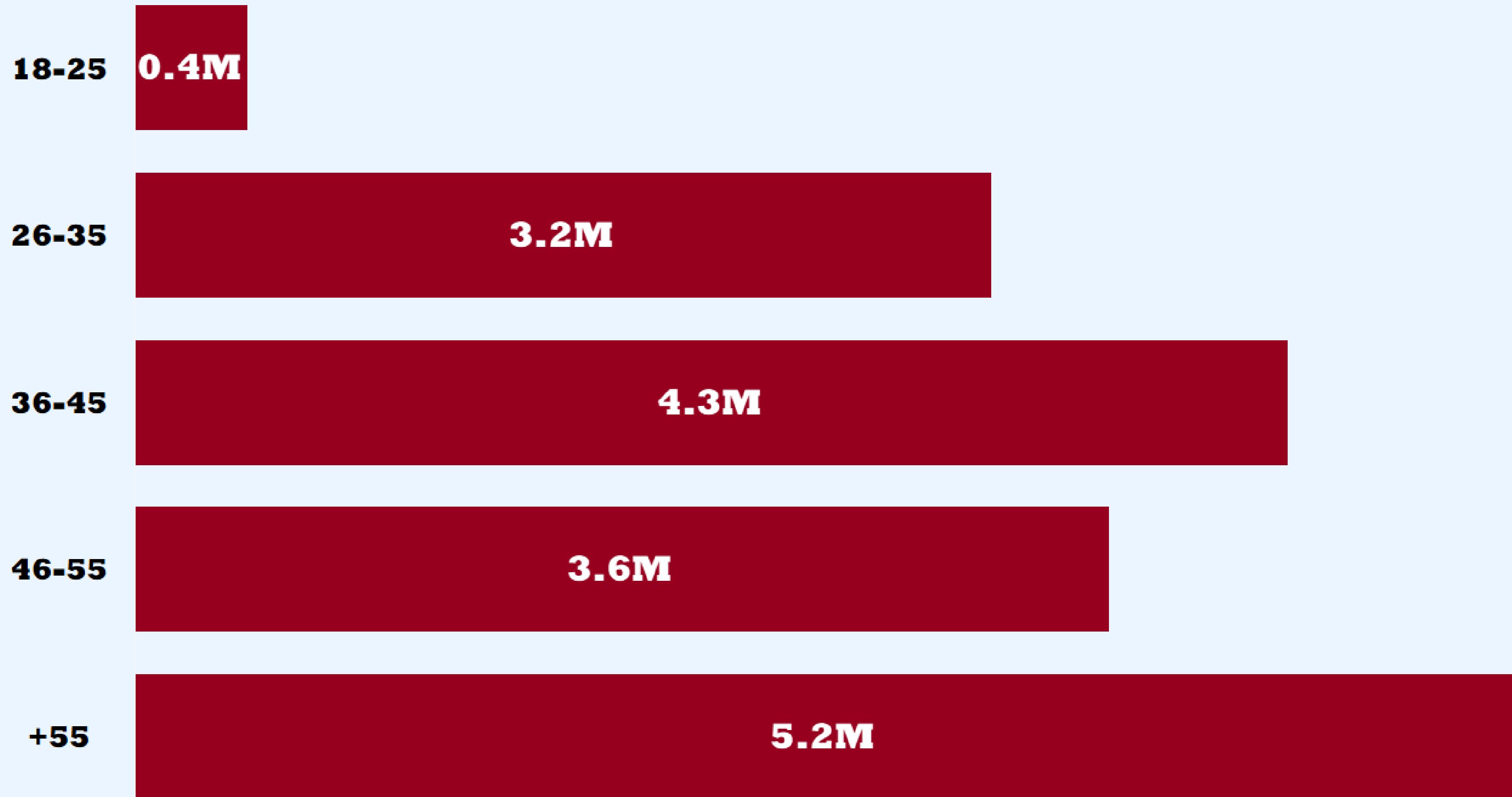
**Female**

**7.9M**

**Corporate**

**3.0K**

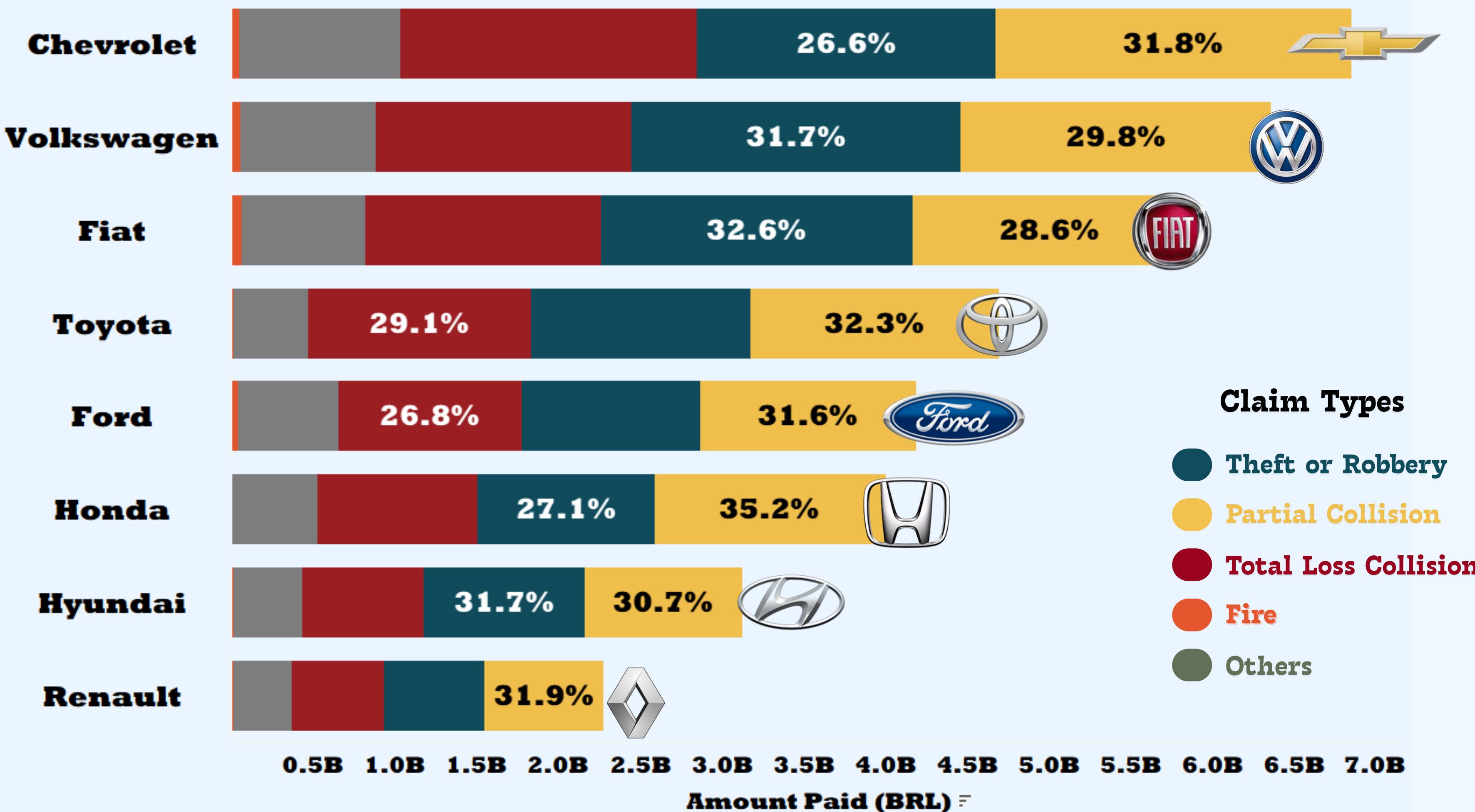
# Number of Claims by Driver Age Group



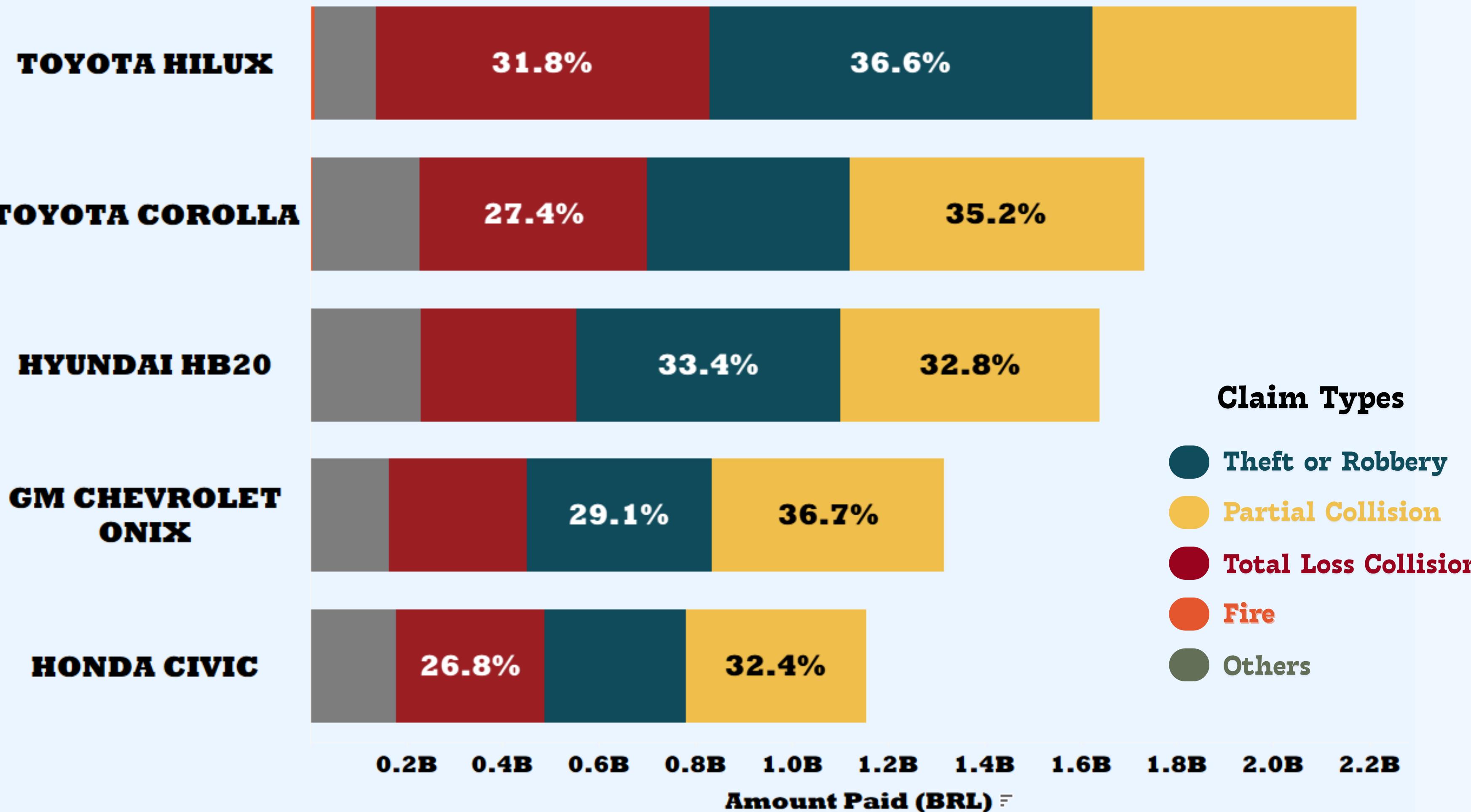
# Amount Paid

# Vehicle Features

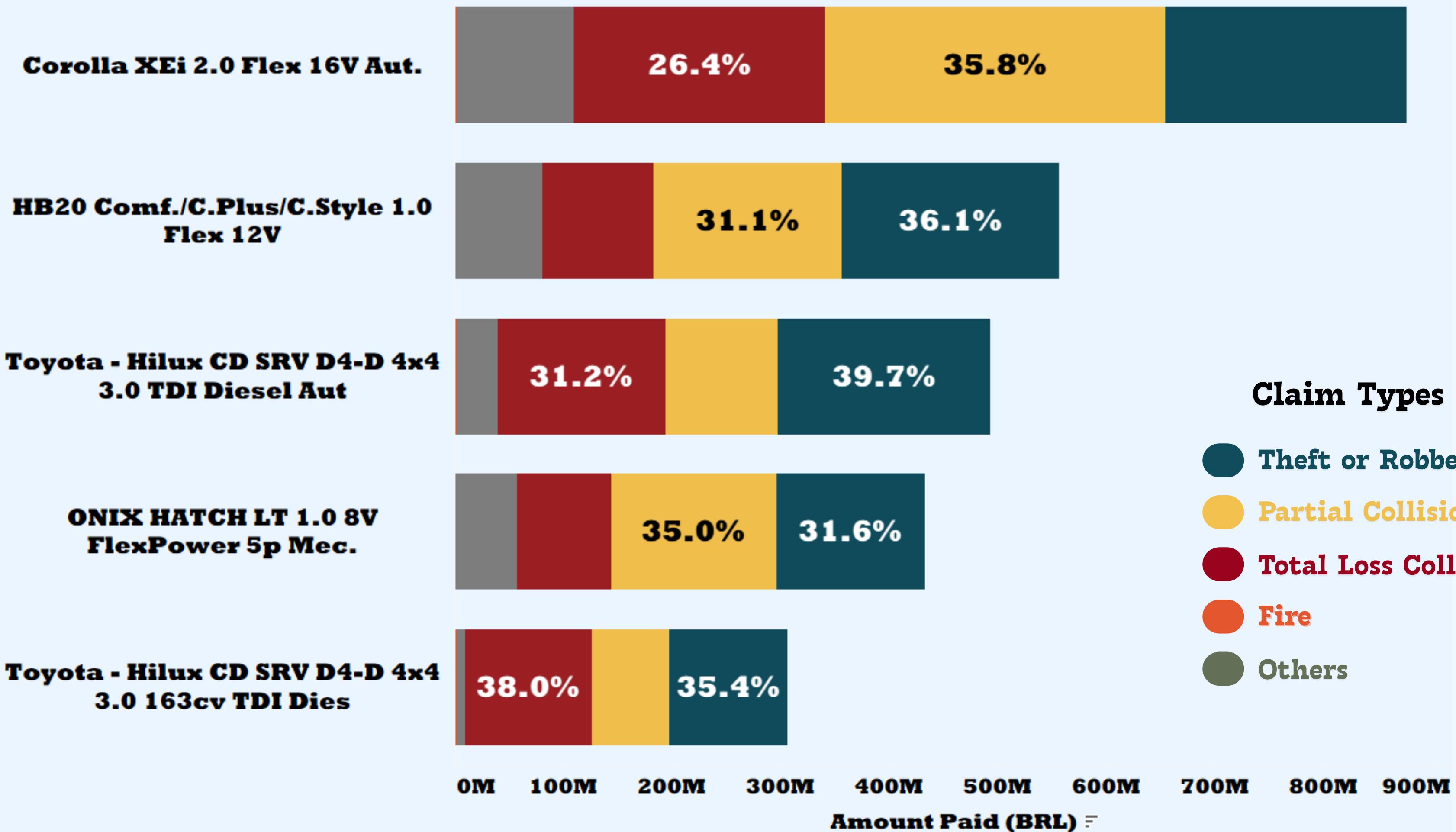
# Top 8 Vehicle Brands by Amount Paid



# Top 5 Vehicle Models by Amount Paid



# Top 5 Vehicle Variants by Amount Paid



# Amount Paid by Vehicle Category

**Passenger -  
Domestic**

**33.8B**

**Truck**

**16.9B**

**Passenger -  
Imported**

**4.1B**

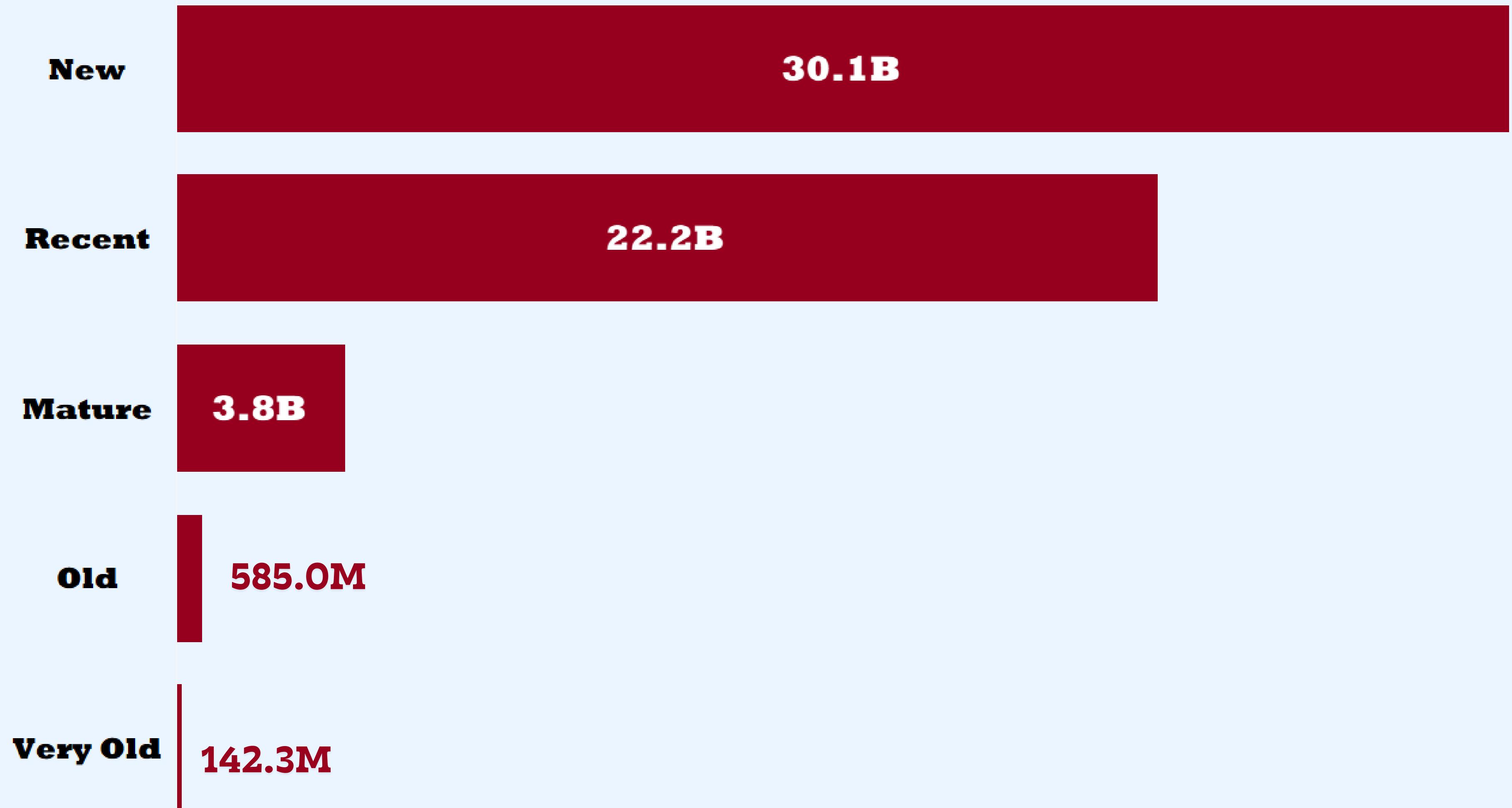
**Motorcycle**

**985.7M**

**Bus**

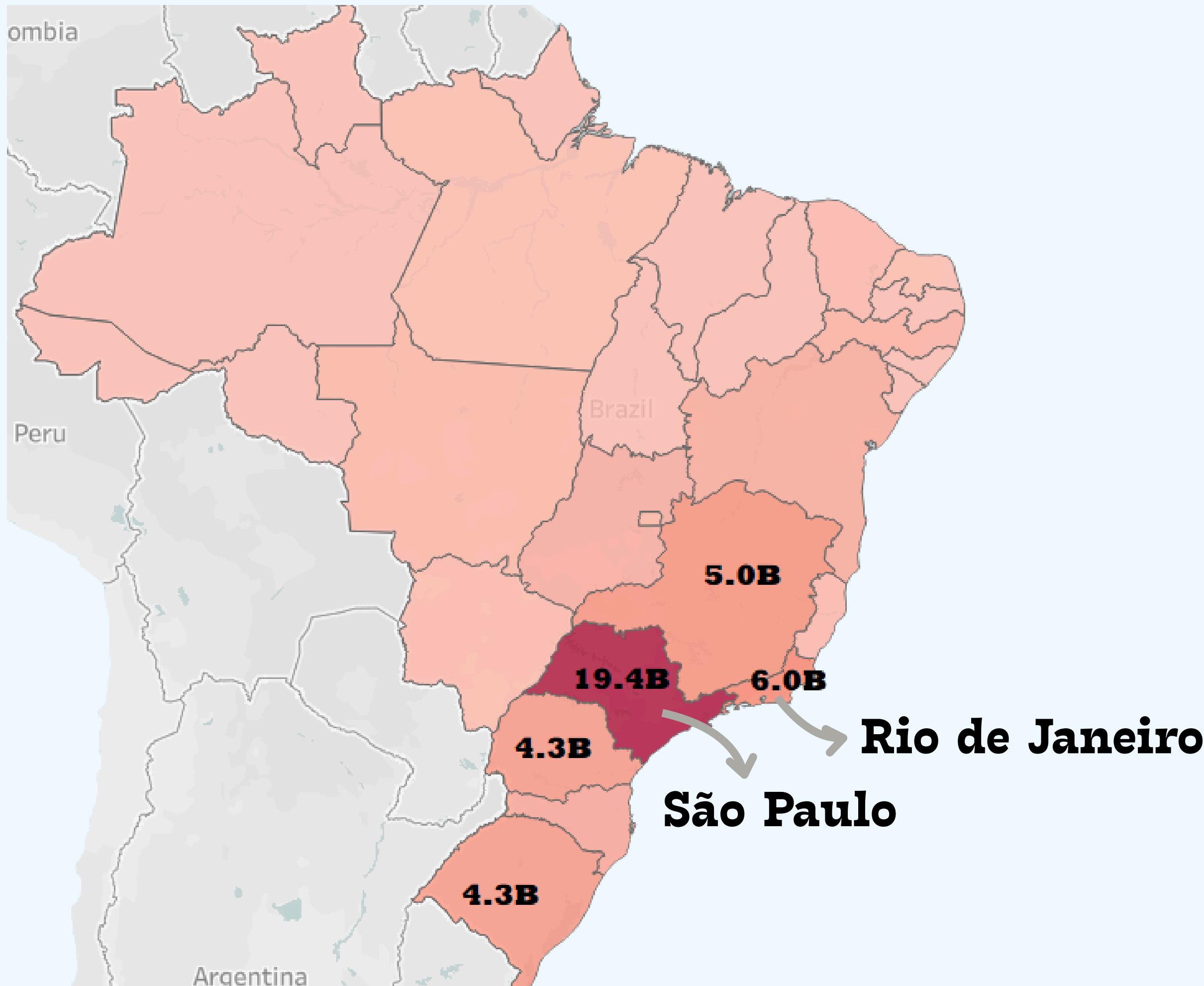
**7.7M**

# Amount Paid by Vehicle Age



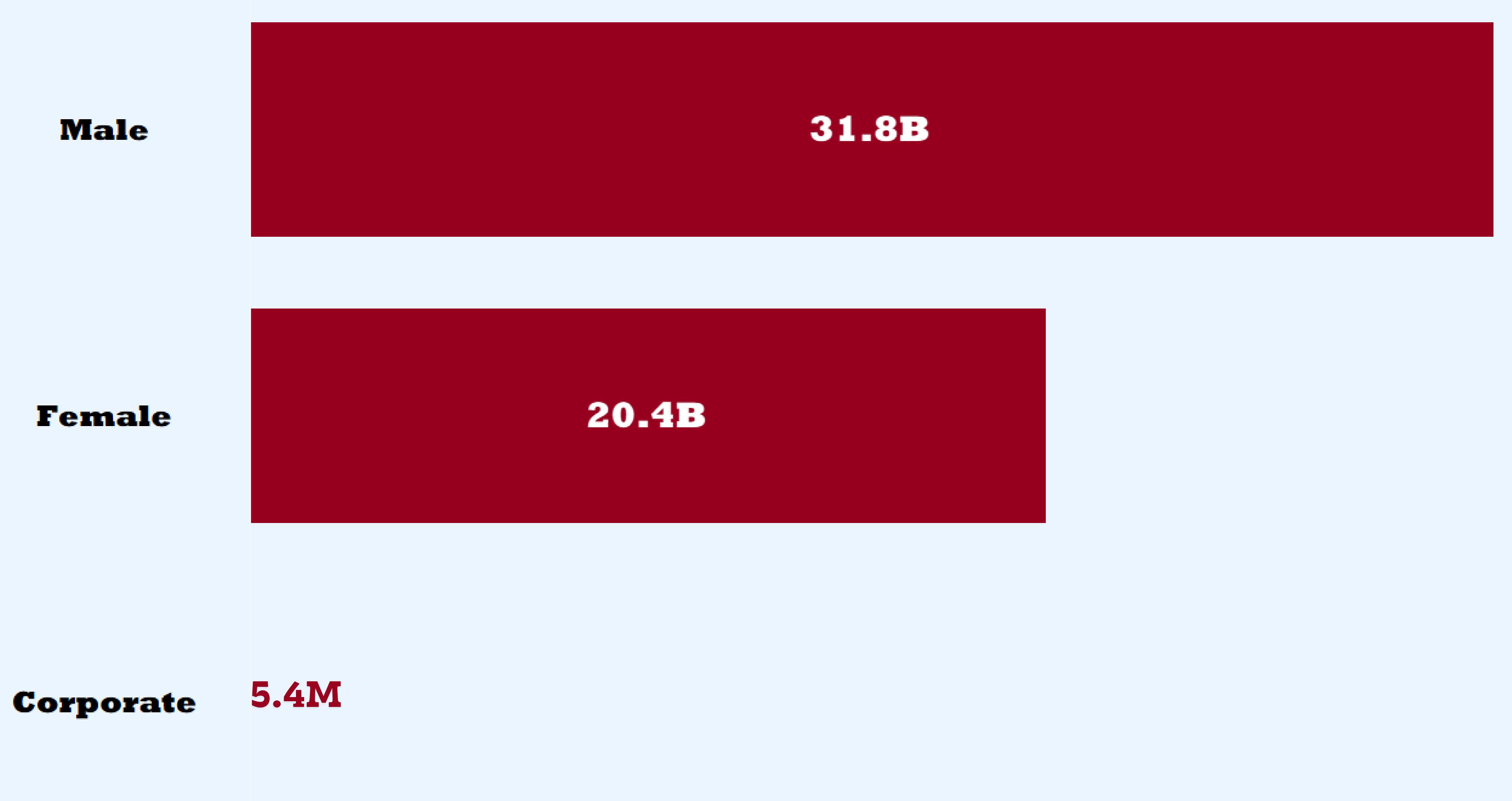
# Location

# Amount Paid by State

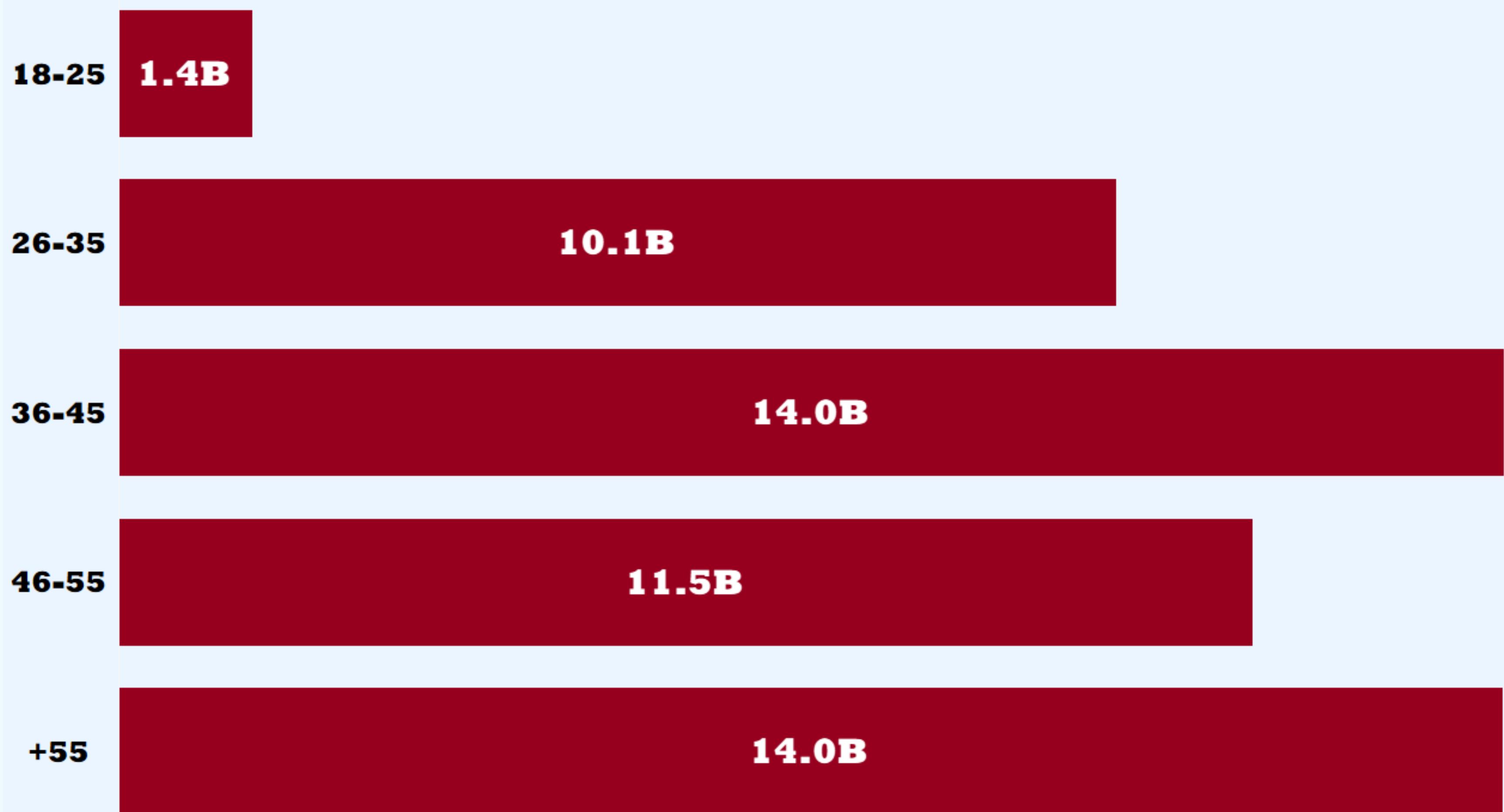


# Driver

# Amount Paid by Driver Gender

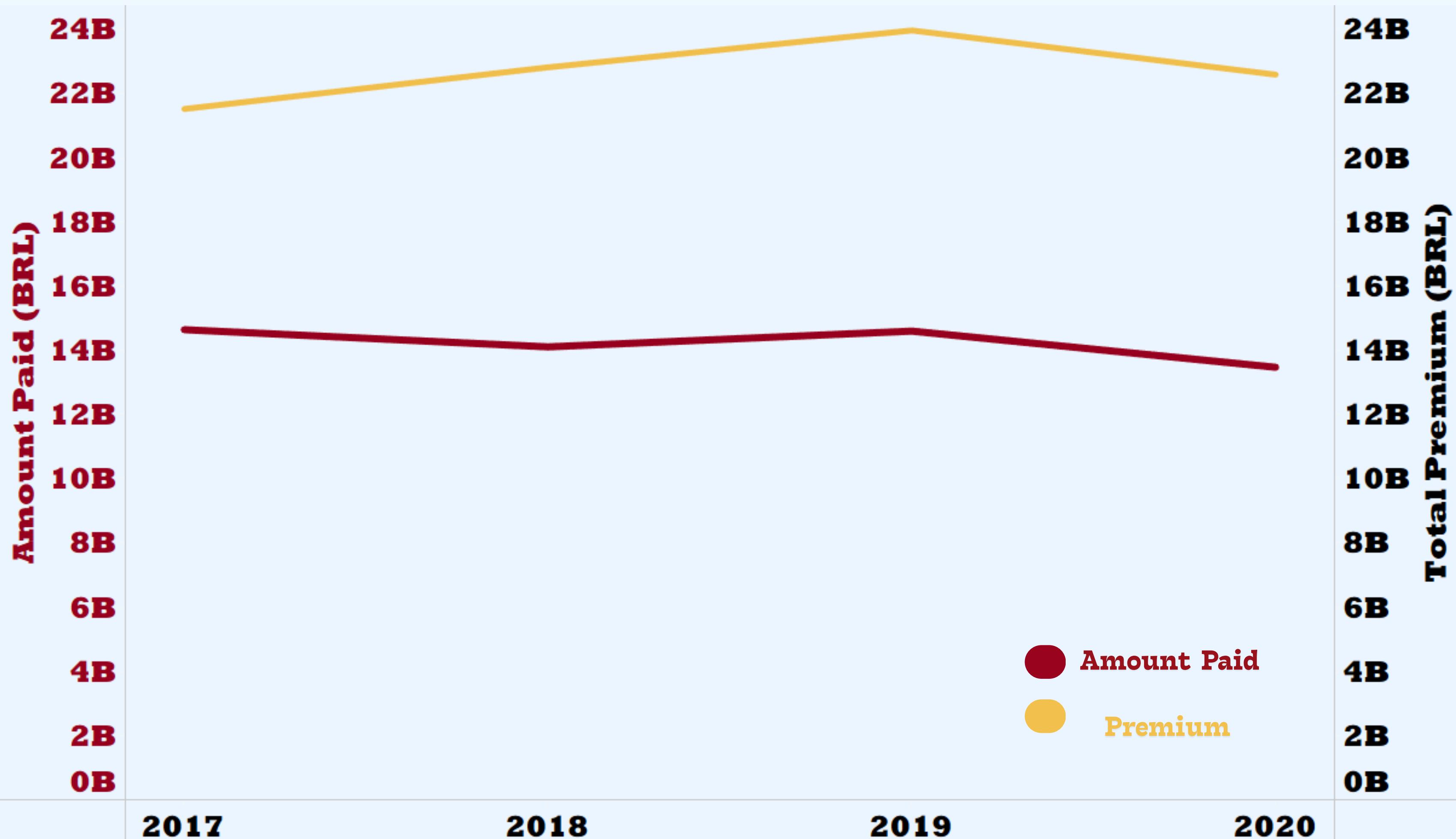


# Amount Paid by Driver Age Group



# Profitability

# Paid Amount vs Premium Over Time (2017-2020)



# Vehicle Features

# Top 8 Vehicle Brands by Loss Ratio

**Lada**

**269.6%**



**Aston Martin**

**96.9%**



**FYM**

**83.1%**



**SsangYong**

**82.8%**



**BMW**

**72.3%**



**Lifan**

**70.9%**



**Toyota**

**69.8%**



**Mitsubishi**

**68.9%**



# Top 5 Vehicle Models by Loss Ratio

**Lada Laika**

**444.7%**

**Aston Demais**

**96.9%**

**FYM Motos -  
Todas**

**83.1%**

**Ssangyong -  
Outros**

**82.8%**

**Toyota Hilux**

**77.0%**

# Vehicle Variants by Loss Ratio

**Lada - Laika SW 5p**

**513.0%**

**Lada - Laika 1.6**

**43.5%**

# Loss Ratio by Vehicle Category

**Passenger - Imported**

**68.9%**

**Passenger - Domestic**

**65.0%**

**Truck**

**59.9%**

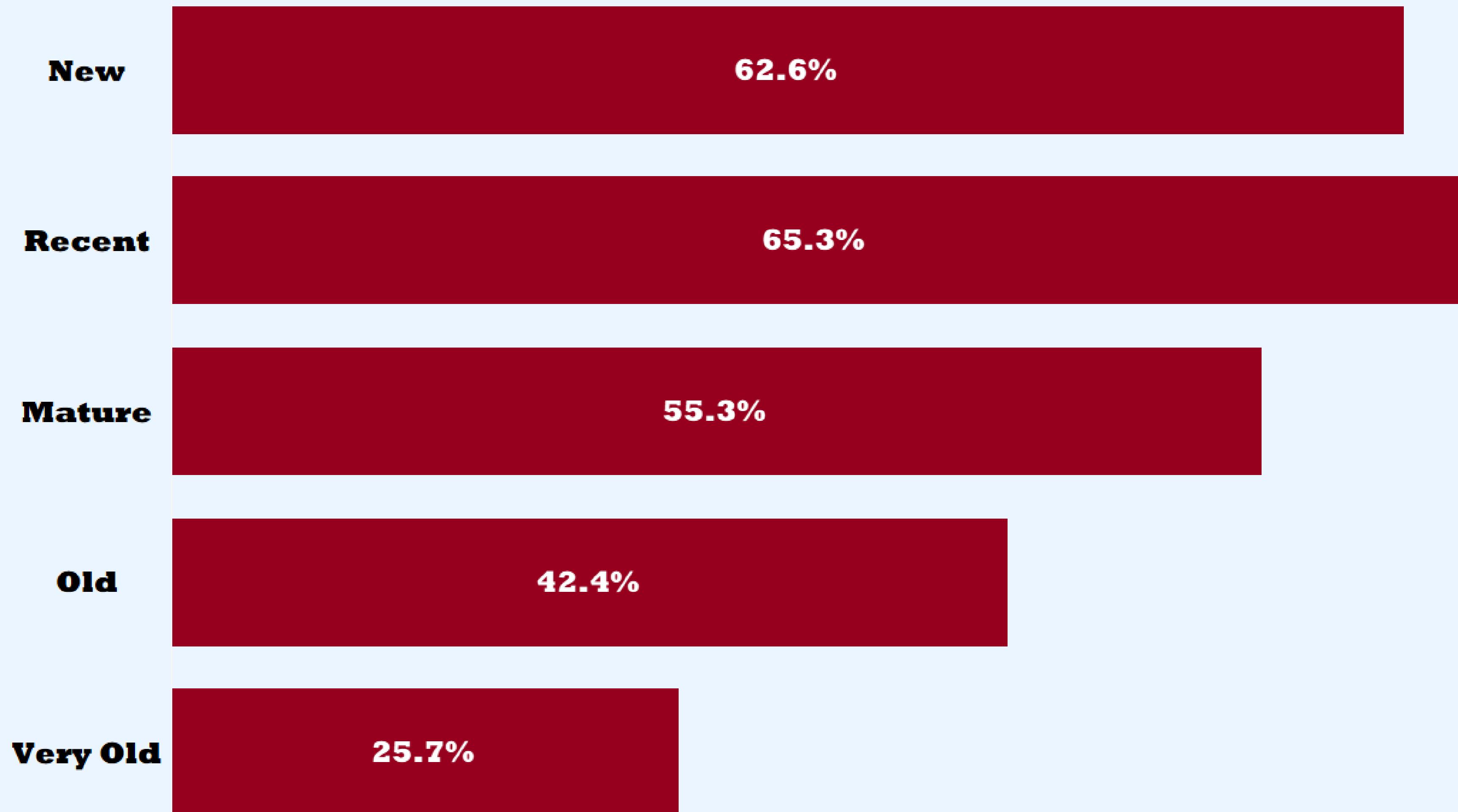
**Motorcycle**

**49.1%**

**Bus**

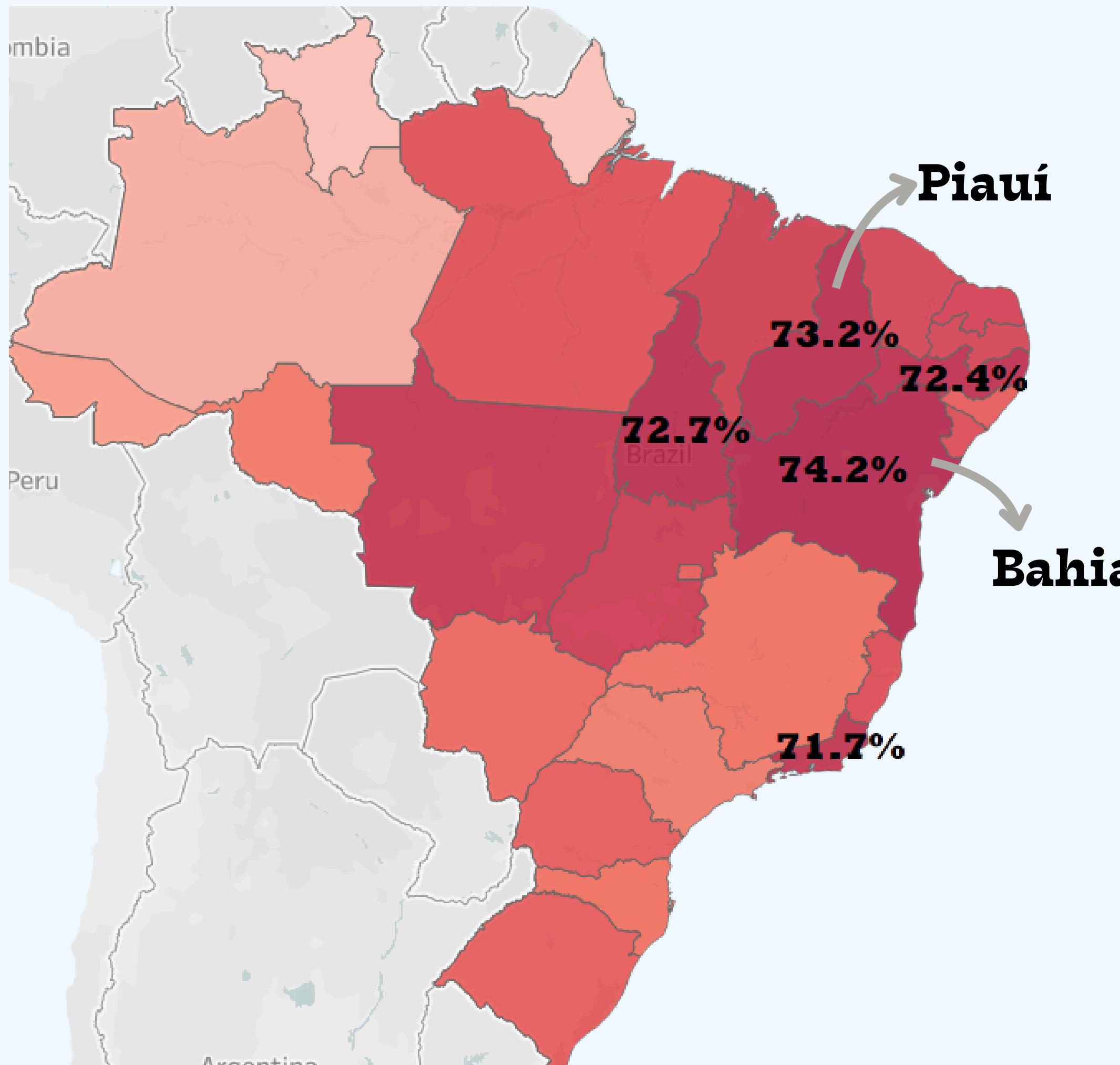
**5.5%**

# Loss Ratio by Vehicle Age



# Location

# State Loss Ratio



# Driver

# Loss Ratio by Gender

**Male**

**74.3%**

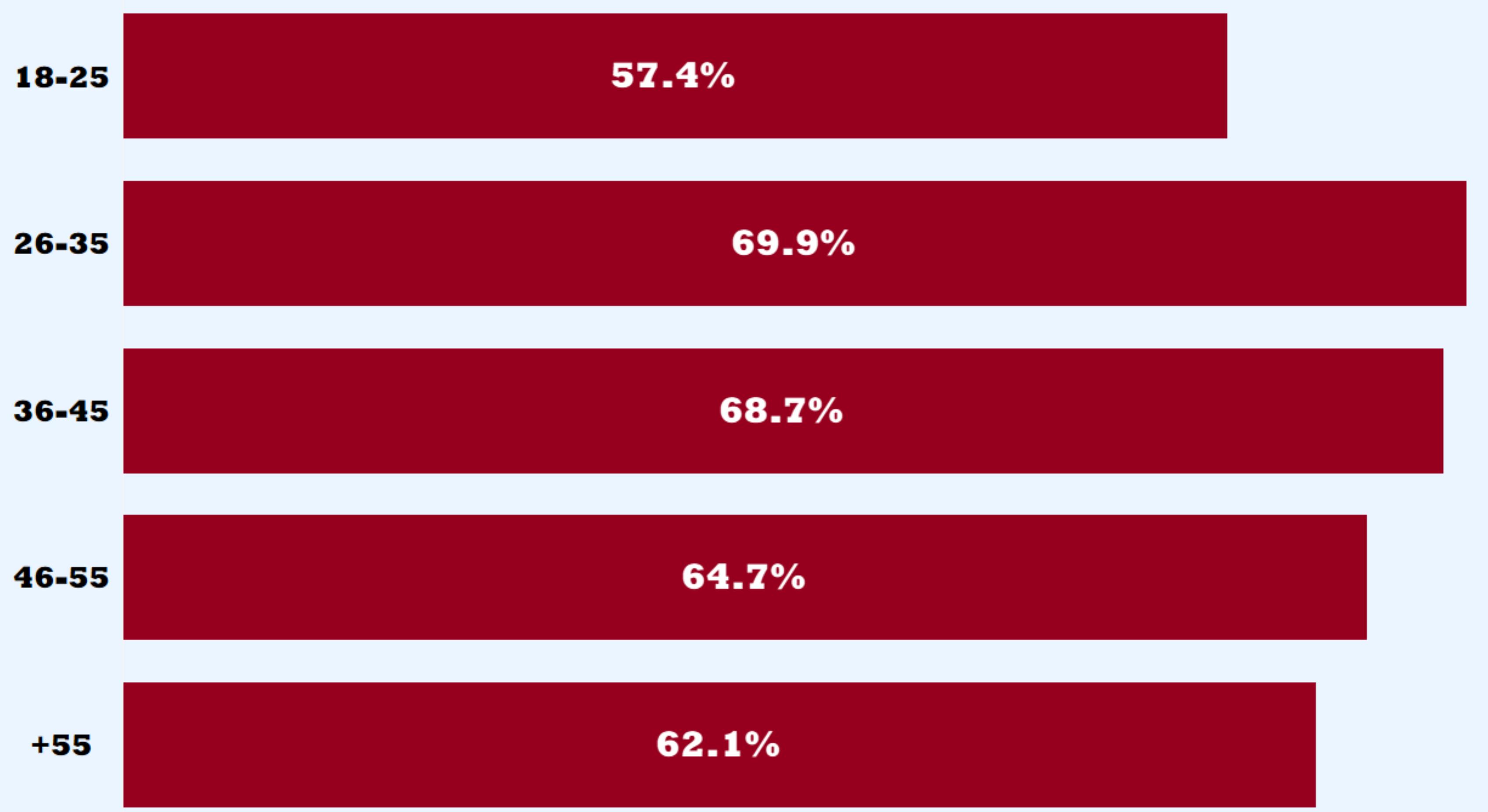
**Female**

**64.9%**

**Corporate**

**0.03%**

# Loss Ratio by Age



# Conclusion

# Key High-Risk Segments Across All Measures

**Vehicle Brand**

Toyota

**Vehicle Age**

Recent

**Vehicle Category**

Passenger - Domestic

**State**

Rio de Janeiro

**Driver Gender**

Male

**Driver Age**

36-45

# Outlier Risk Segment



**Lada Laika SW 5p**

**loss ratio (513%)**



# Recommendations

**Increase premiums for high-risk vehicle segments**

**Strengthen underwriting for high-risk drivers**

**Apply territorial pricing adjustments**

**Re-price Outlier Vehicles With Extremely High Loss Ratio**

# Thank

# You

