

Habitation Claims

GSU
Data Visualization Course
HW2

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Content

Business Problem:

- Executives of insurance company ABC suspect that habitalational claims are becoming a more prominent component of loss ratios for the company. Executives would like for the data science team to investigate this particular type of claim and make recommendations based on their findings.

Definitions:

- Insurance company ABC: is a property and casualty insurance company that sells commercial P&C insurance to clients in the habitalational sector.
- Habitalational Sector: Buildings that are primarily used for habitalational purposes, like apartments, hotels, and condominiums.
- Habitalational Claims: Failure to provide safe and livable housing.
<https://www.crcgroup.com/Tools-Intel/post/habitability-lawsuits-raise-new-risks-for-apartment-owners-insurers?portalid=34>
<https://www.nolo.com/legal-encyclopedia/free-books/renters-rights-book/chapter7-2.html>

Data set

Compositions & Characteristics

- ❑ Dimensions : 44,658 rows by 920 columns
- ❑ Rows : Each row represents a property location
- ❑ Date Range : 2016-2020
- ❑ States : All
- ❑ Features : 386
- ❑ Other Claims & Premium variables

Row Labels	Count of Column_Name
feature	190
rate	47
premium	43
limit	37
deductible	19
Location	8
ID	6
Date	6
Location_other	4
Fire	2
PolicyType	2
Grand Total	364

Row Labels	Count of Column_Name
<class 'float'>	239
<class 'str'>	54
<class 'int'>	43
<class 'NoneType'>	42
<class 'datetime.date'>	6
<class 'bool'>	2
Grand Total	386

Metrics By Year

Objective:

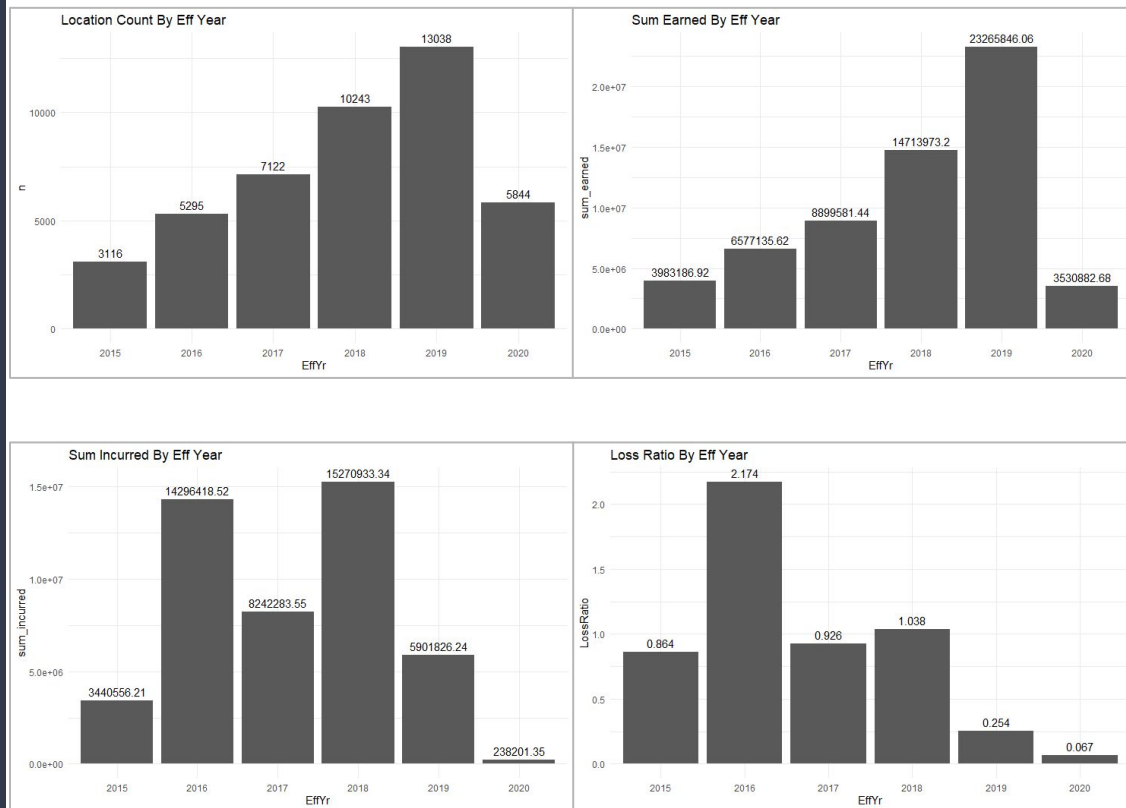
- Illustrate key profit and loss metrics by year.

Plots:

- Loss count, sum earned, sum incurred and loss ratio by year.

Observations:

- The book of business in terms of count of policies and earned premium is increasing monotonically over time.
- Incurred amounts are inconsistent by year and loss ratios are trending downward.



Claims Composition

Objective

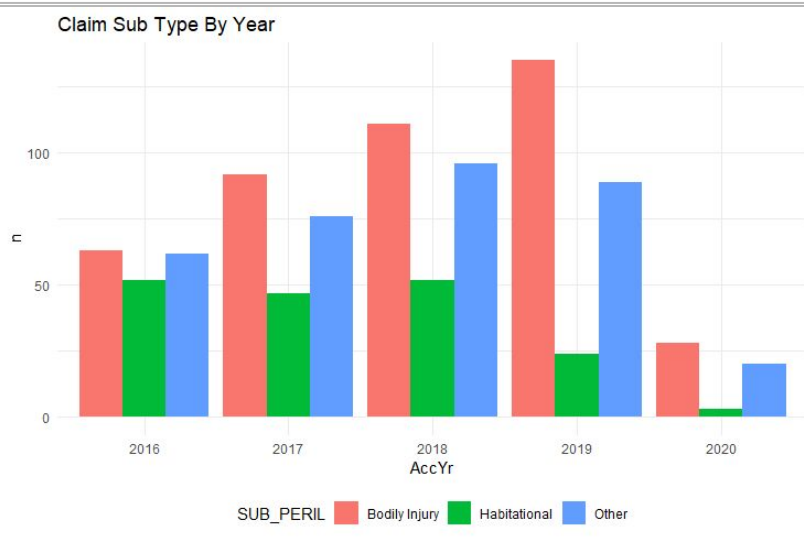
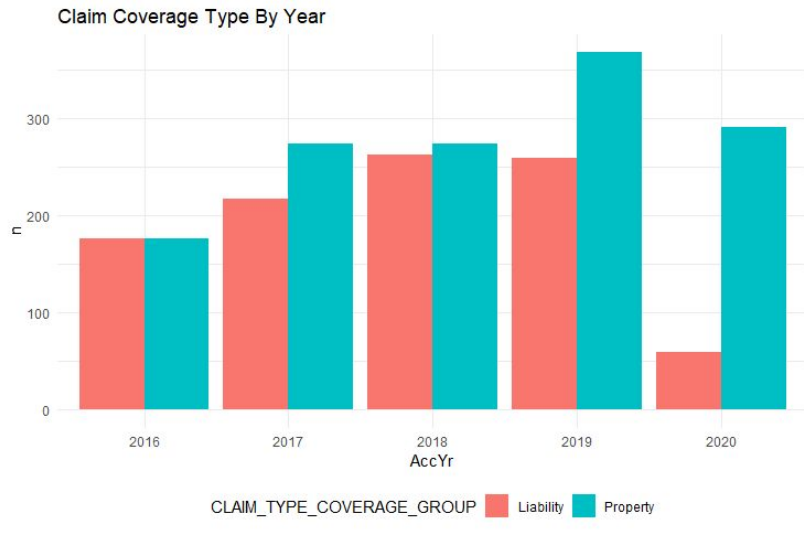
- Illustrate trend in claim counts by year

Plots

- All claim counts and liability claim counts by year.

Observations

- Total claim counts appear to increase year of year. Liability claim counts fall off after 2018 while property claims increase.
- Habitational claims appear to have a downward trend over time.



Habitational Claims

By State

Objective

- Determine if there are any geographic attributes to habitational claims.

Plots

- Location count and habitational claim count by state.

Observations

- The count of habitational claims appears to be proportional to the largest states (CA, IL, NY)

Location Count By State



Habitational Claim Count By State



Habitation Claims

Loss Distribution

Objective

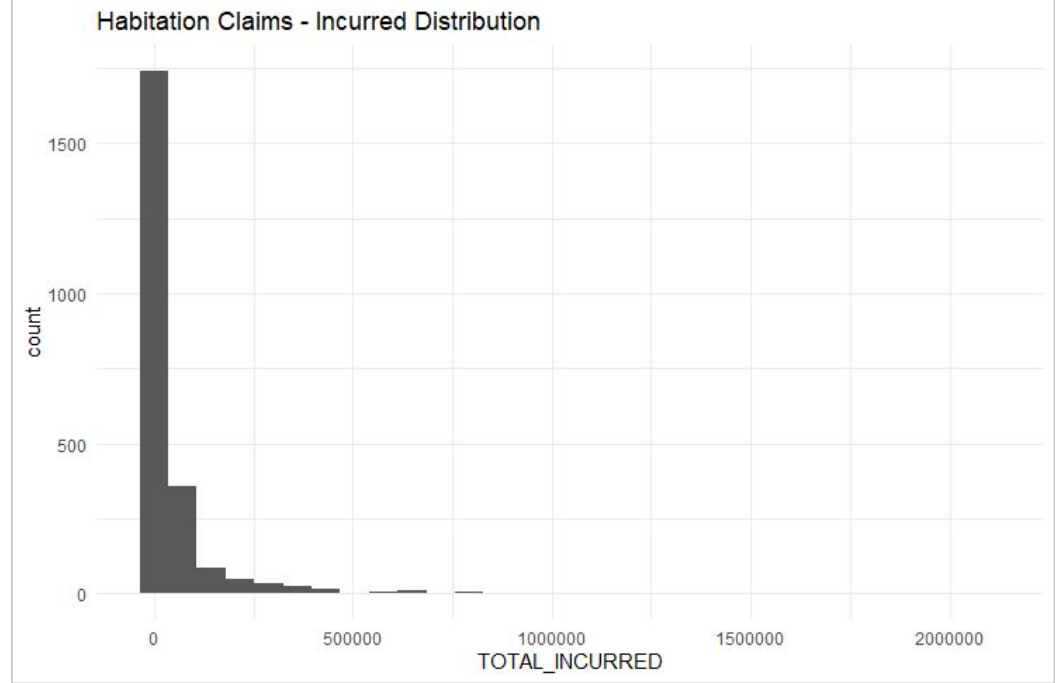
- Illustrate the distribution of habitation claims by incurred amount.

Plots

- Distribution of habitation claim incurred amounts as well as measures of central tendency.

Observations

- The majority of the claims are small, around \$0-5k.
- There are a few very large outliers that may have contributed to materially to the overall loss ratio.



```
> summary(data.claims.hab$TOTAL_INCURRED)
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0    1076    9727   59452   39557 2090854
```

Habitational Claims

Large Losses (> 250k)

Objective

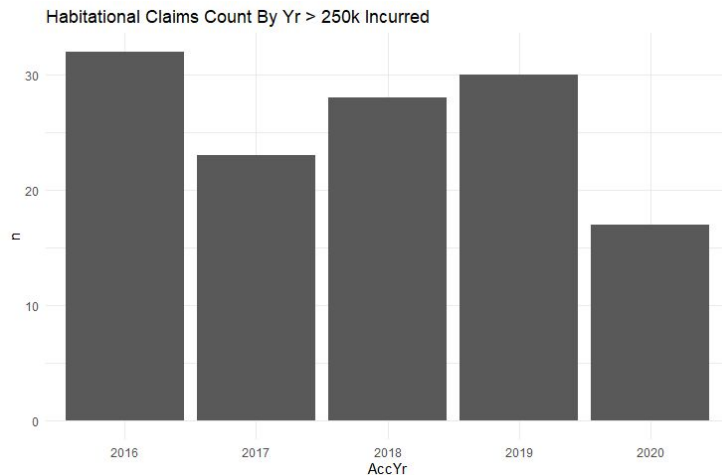
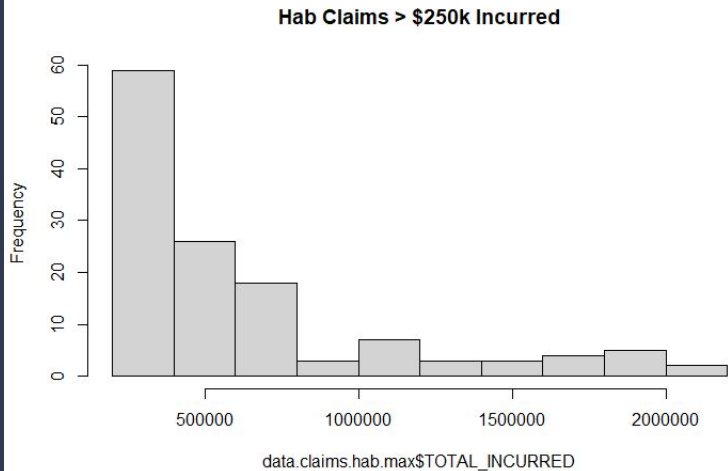
- Illustrate the distribution of large losses and trend of occurrence over time.

Plots

- Distribution of large losses
- Count of large losses by year

Observations

- There appear to be a significant number of claims > 250k.
- While overall habitation claim counts have decreased over time larger losses appear to have increased.



Conclusion | Key Takeaways

- Senior management shared concerns about a perceived increase in habitation claims that could cause a problem in future loss ratios.
- Insurance company ABC appears to have a growing and increasing profitable business over time.
- While overall claims counts appear to be increasing in light with the growth of the book of business, liability, and in particular, habitation claims are decreasing.
- There does not appear to be a significant difference in the distribution of habitation claims by state.
- Losses tend to be small and infrequent with the potential for large losses.
- While in the aggregate habitation claims are decreasing over time, large losses, defined as those with incurred amounts > 250k, are increasing.
- The fact that habitation claims have exhibited large losses in the past combined with the fact that these large losses are increasing over time could have contributed to the executives perception that this particular claims type is becoming a problem.