An Exploratory Data Analysis on Aviation Safety

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Landmark Airlines

- Domestic service (USA)

- Providing "flight experiences" and short-range charters

- Flight packages are available for 1 to 5 passengers

Business Problem

What are the safest aircraft available ?
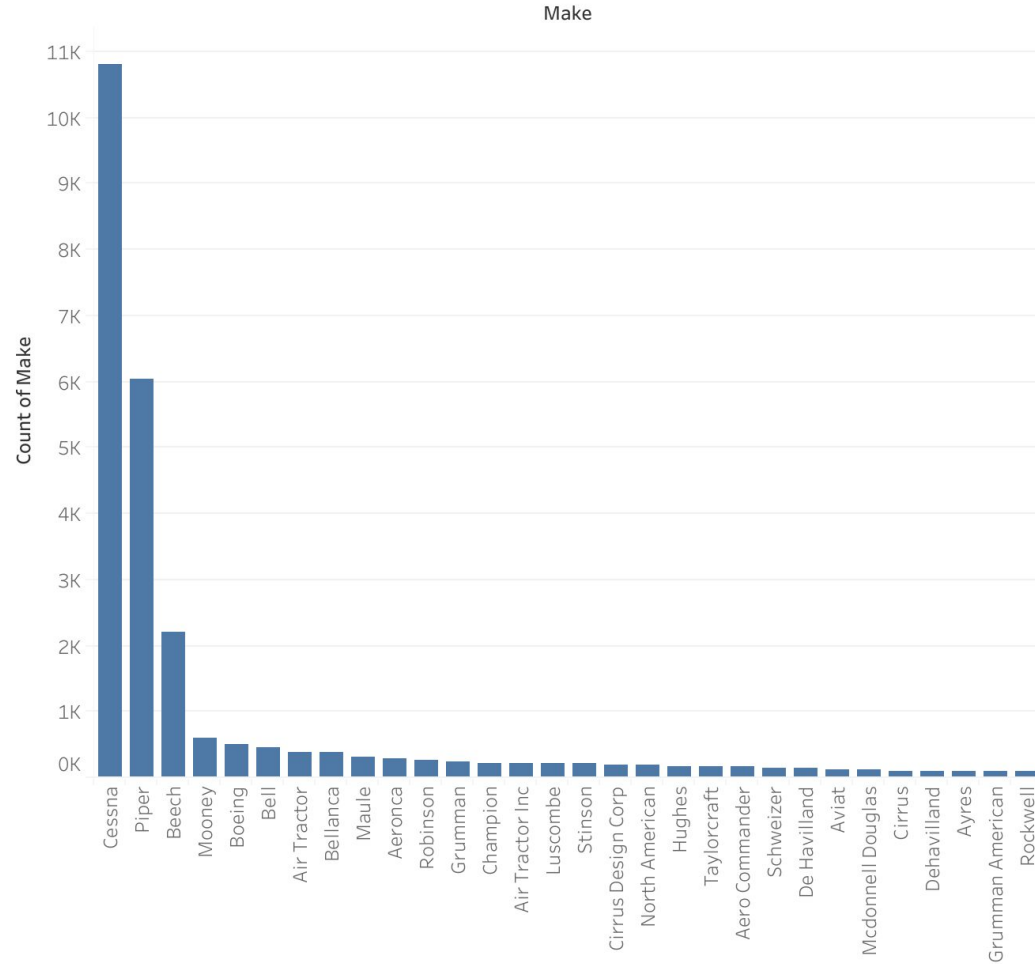
What are the operational risks?

How do we determine safety?

The Data

- Filtered by top manufacturers to ensure a significant data set for analysis.

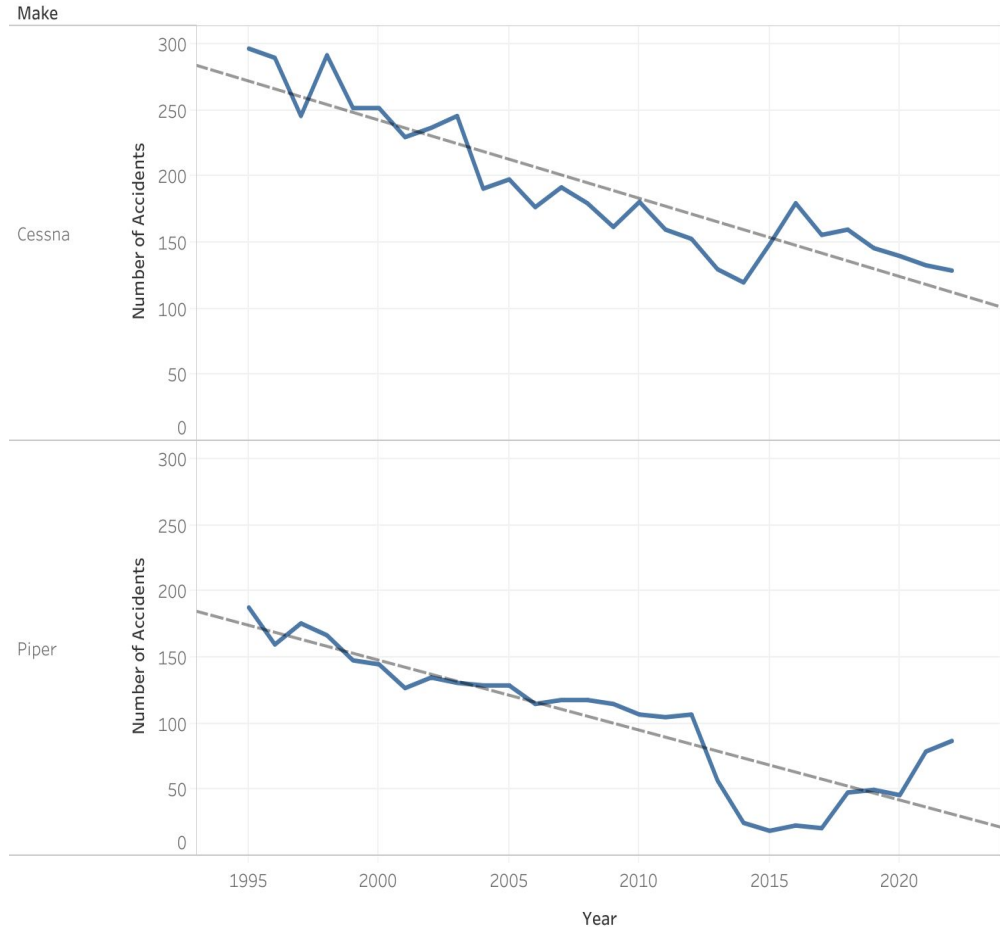- "Cessna and Piper are the most common aircraft (for general aviation) by a massive margin."

Count of Makes

Safety over time

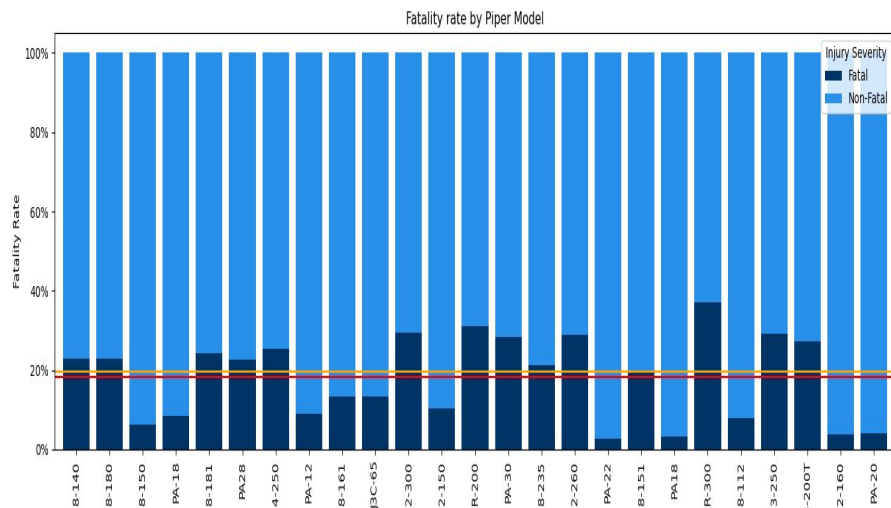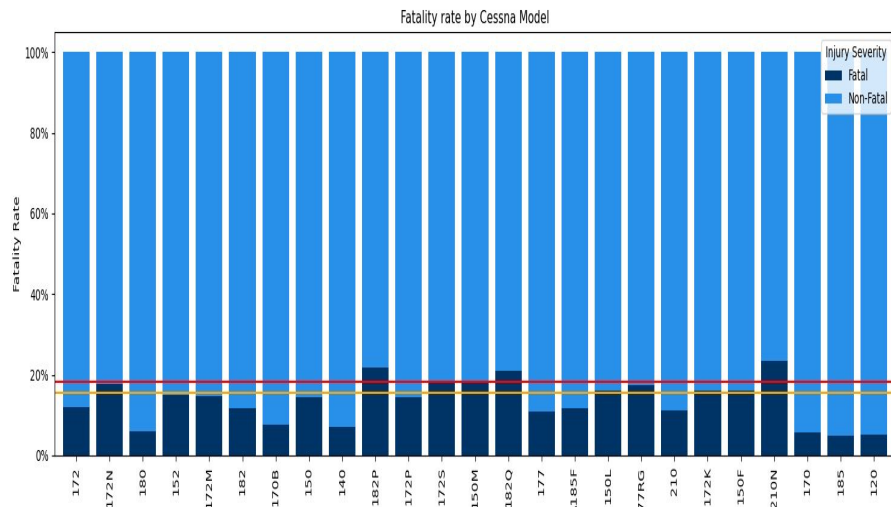- Accidents in Cessna and Piper Aircraft are trending downwards since 1995

Accidents over time

Cessna + Piper

- Filtered by top Models to ensure a significant data set
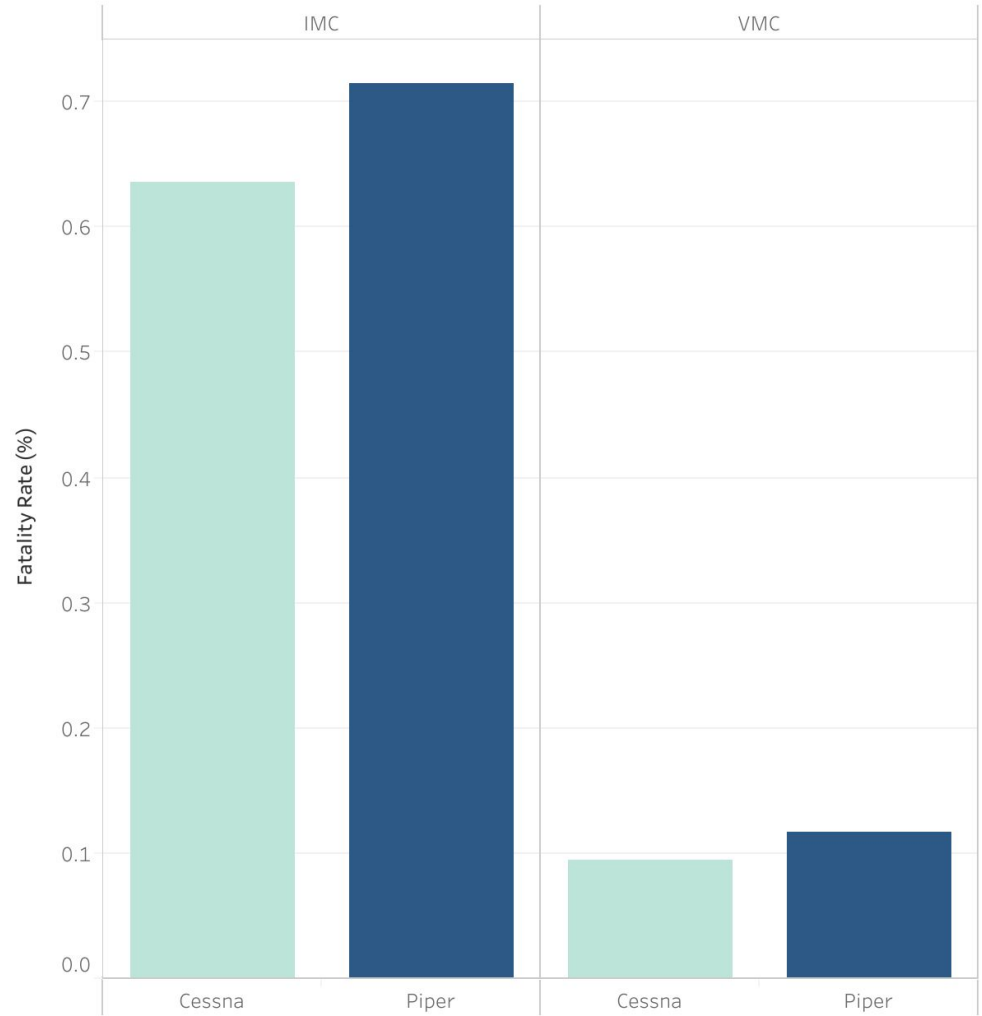- Calculated fatality rate for each accident

- Red lines: National average
- Orange lines: Make Average

Impact of Weather on Flying

- Flying in instrumental weather conditions leads to significantly deadlier accidents

Weather v. Fatality Rate

Accident Location

- Cities with over 10 accidents since 1995
- Alaska and the Pacific Southwest have disproportionately experienced aviation accidents

Accident Count of Cities (>=10)

Accidents
- 10
- 20
- 30
- 40
- 50
- ≥ 60

Fatality Rate (%)
0.0000   0.3000

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Observations and Recommendations

Cessna and Piper standout among manufacturers

- Ubiquity
- Safety
- History of consumer trust

Minimize flying in IMC conditions

- Accidents in instrumental weather conditions end in more fatalities

Hire Experienced Pilots

- Most important aspect of safety in general aviation

- According to NTSB investigations into air accidents, over 88 percent of all plane crashes are attributed, at least in part, to pilot error.

Next Steps

Additional Data

- **Our dataset only included aviation accidents**

- **Need a dataset of ALL flights to determine accident rate**

Data Flaws

- **Survivorship bias**

- **Statistical Analysis on incomplete dataset**

Questions?

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