

An Exploratory Data Analysis on Aviation Safety



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Landmark Airlines

- Domestic service (USA)
- Providing “flight experiences” to Americans
- Flight packages are available for 1 to 5 passengers



Business Problem

 **What is the safest aircraft available ?**

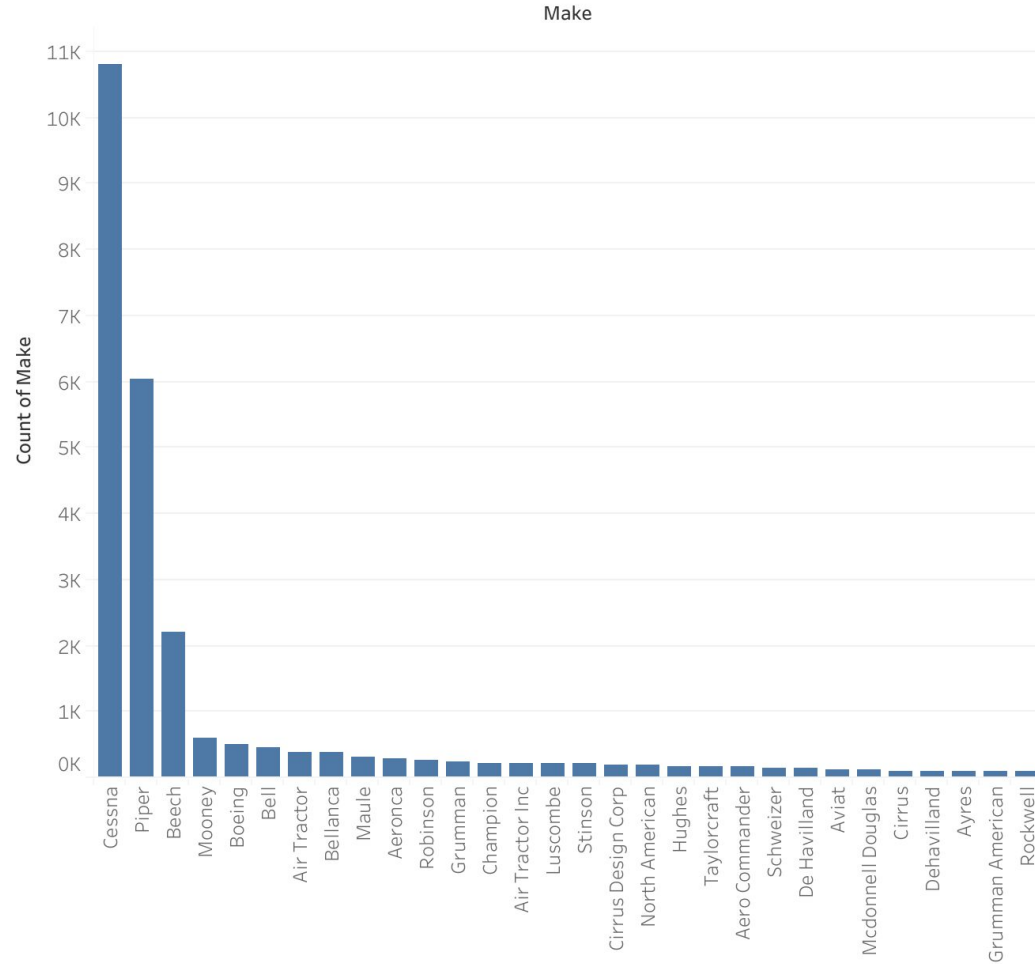
 **What are the operational risks?**

 **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.”

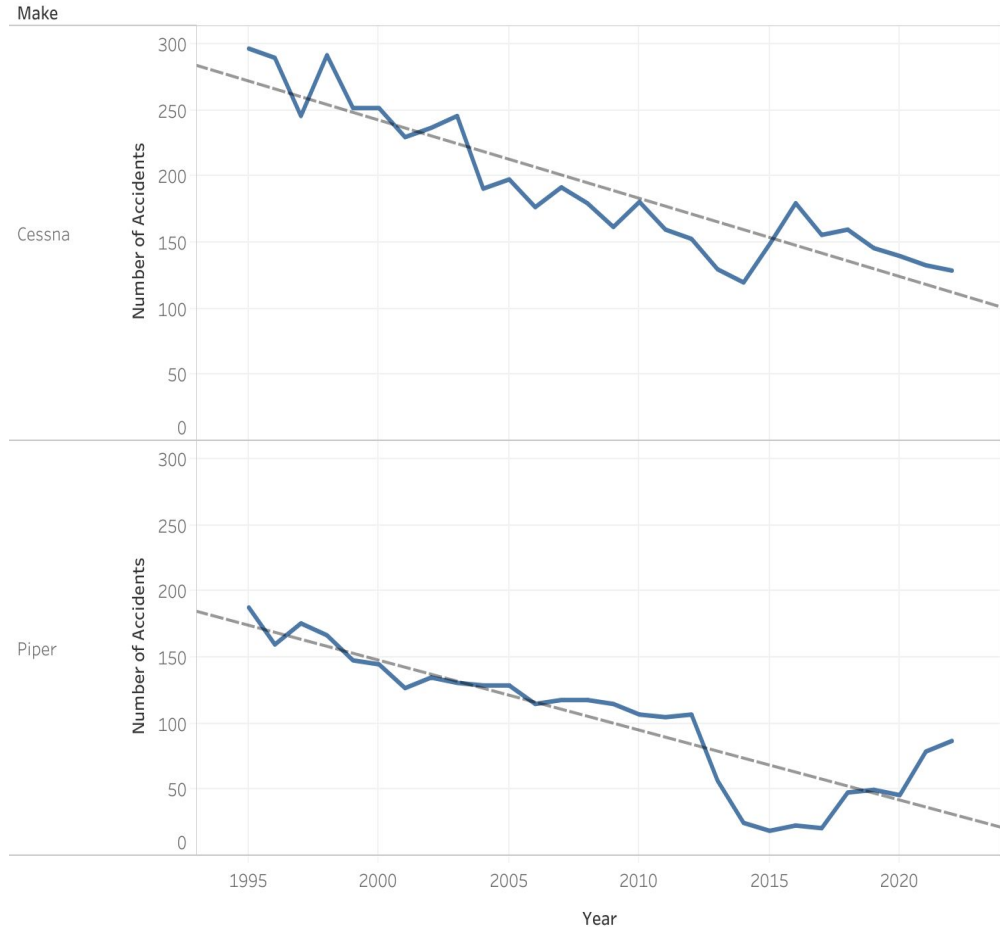
Count of Makes



Safety over time

- Downward trend for yearly accidents in Cessna and Piper Aircraft (since 1995)

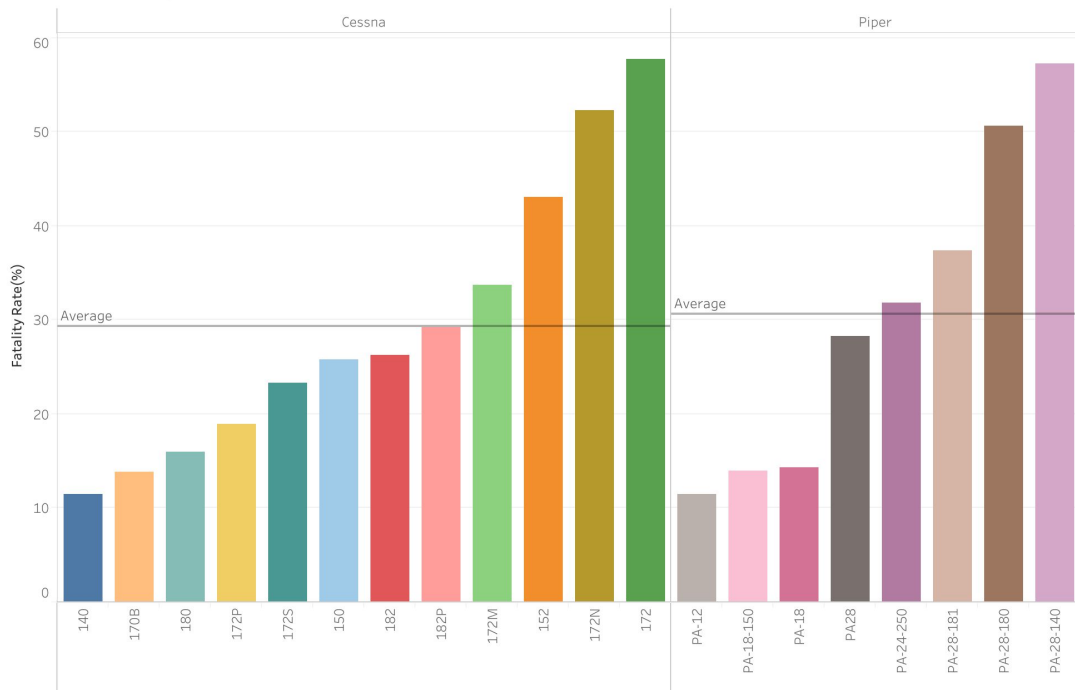
Accidents over time



Cessna + Piper

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

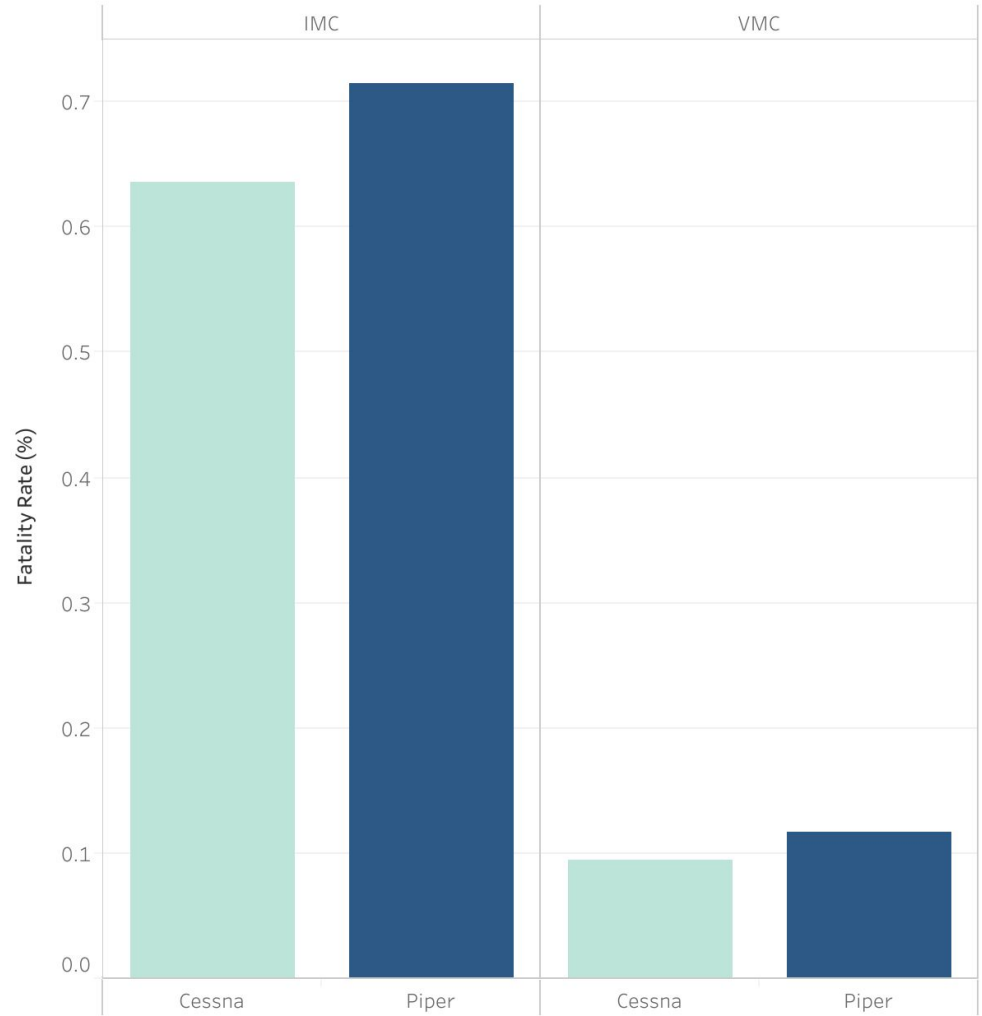
Model v. Fatality Rate



Impact of Weather on Flying

- Flying using instruments leads to significantly more deadly accidents

Weather v. Fatality Rate



Accident Location

- Cities with over 10 accidents since 1995
- Alaska and the pacific southwest are disproportionately likely to experience aviation accidents

Accident Count of Cities (≥ 10)



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

Avoid basing within the west coast

- Most aviation incidents appear to occur within that area, potentially because of large population.
- East coast has largely populated areas with virtually no accidents comparatively to the west coast

Further Recommendations

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.

Caution while flying during busy periods

- Take extra precaution when flying during weekends and busy summer months due to increased air traffic
- Most accidents take place during these times

Avoid providing services within Alaska

- Disproportionate number of aviation accidents
- Low population, hence less customers interested

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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