AIRPLANE RISK ASSESSMENT

by;
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This assessment explores potential risks associated with entering the aircraft transportation business.

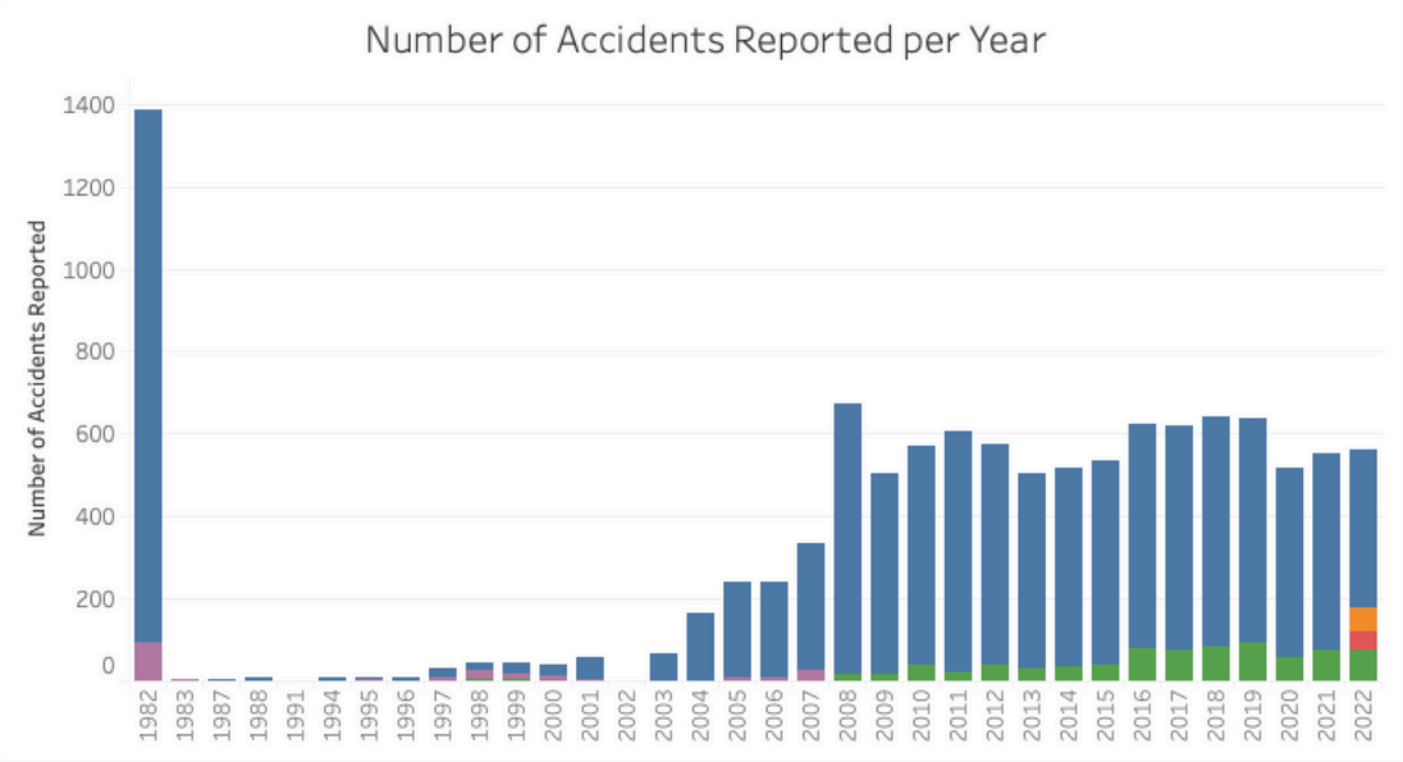
It analyzes risk factors related to airplane applications, manufacturers, and size.

- Which airplane applications are the most dangerous? Instructional, Aerial
- Which airplane manufactures have the best safety record? Boeing, Airbus
- What size of airplane is the most reliable? 2+ engines

DATA SET

National Transportation Safety Board Accident Data

- Reported aircraft accidents
- Within the US and international waters
- Filtered to only include relevant data
  - 27,580 relevant reports
  - 1982 –2022



INFORMATION IN THE DATA SET

Airplane information

- Make
- Model
- Engine type
- Number of engines

Flight information

- Airport name
- Phase of flight
- Purpose of Flight

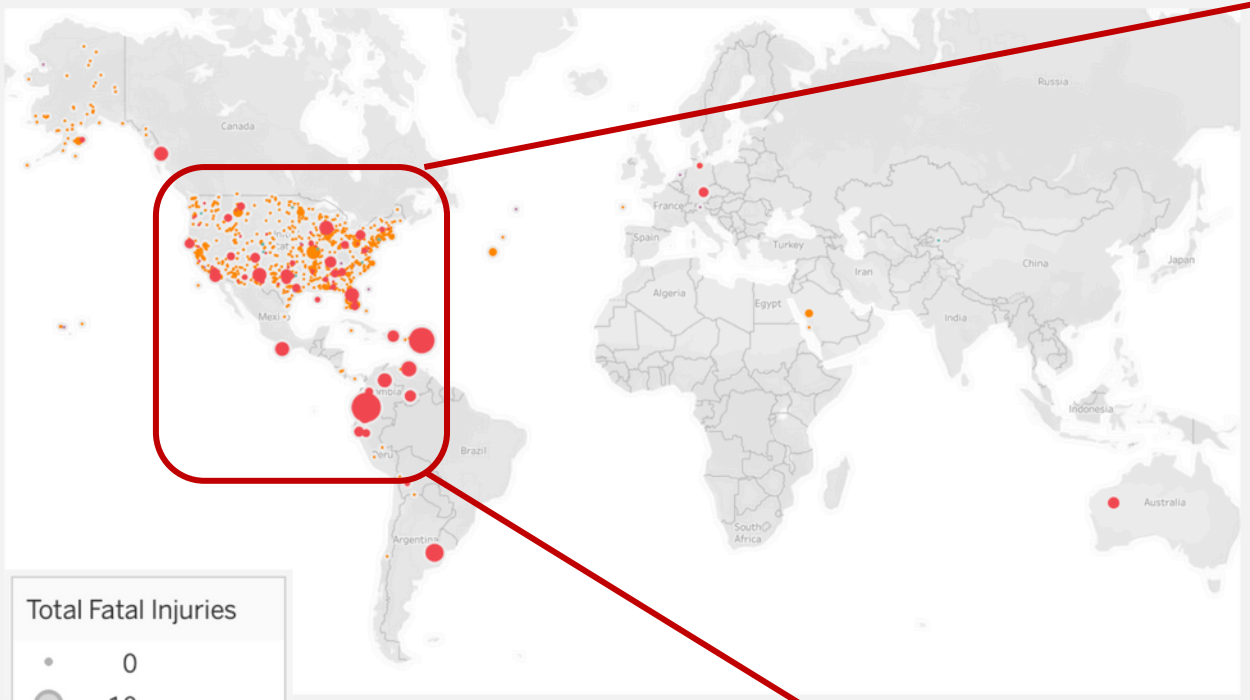
Location information

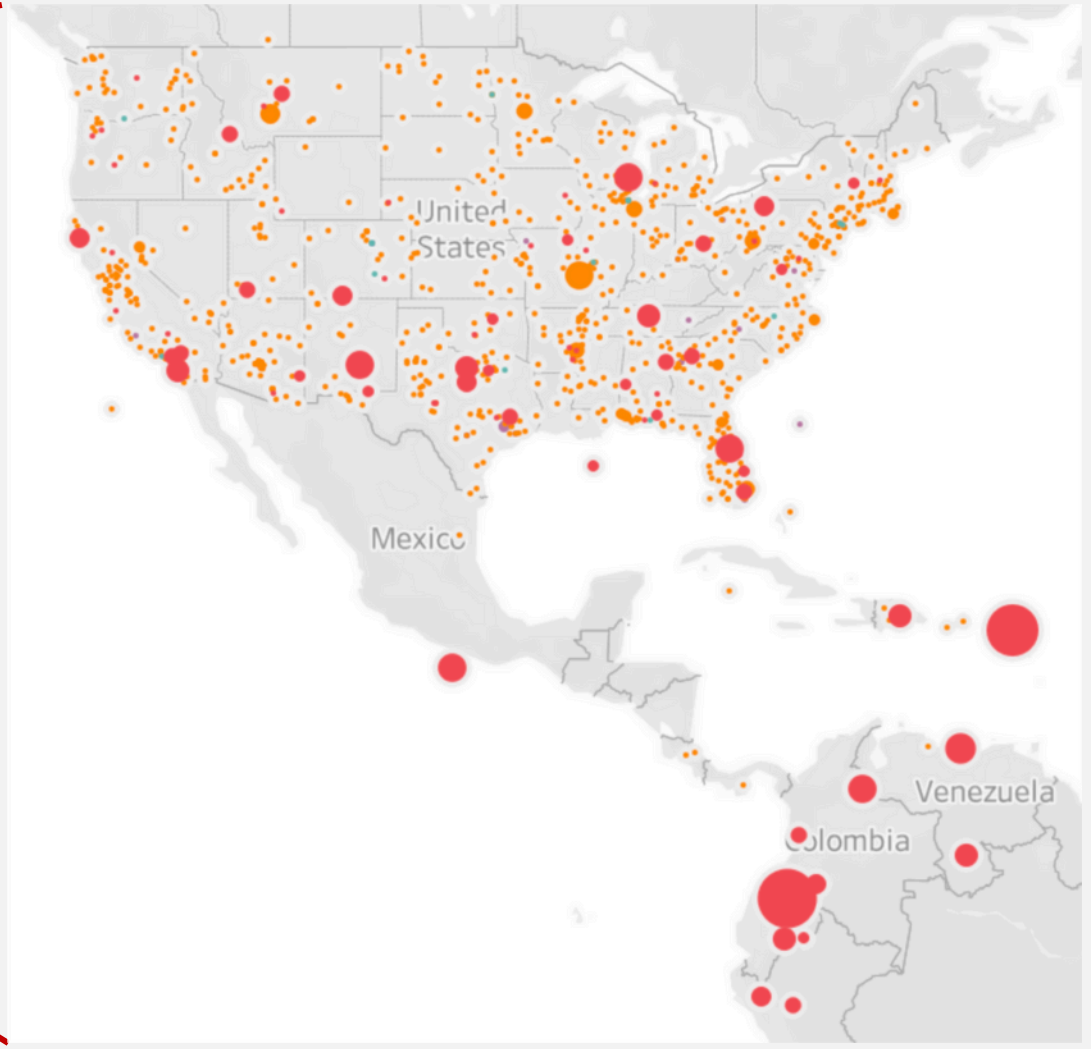
- Accident location
- Latitude
- Longitude
- Weather conditions

Injury information

- Fatalities
- Severe injuries
- Minor injuries
- No injuries

LOCTIONS WHERE ACCIDENTS OCCURRING





Total Fatal Injuries

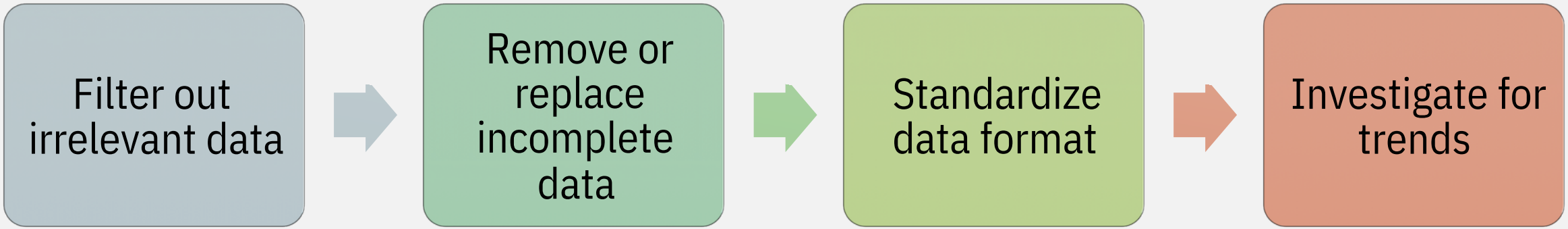
- 0
- 10
- 20
- 30
- ≥ 40

Aircraft Damage

- Destroyed
- Minor
- Substantial
- Unknown

Most Accident Reports occurred within the Americas

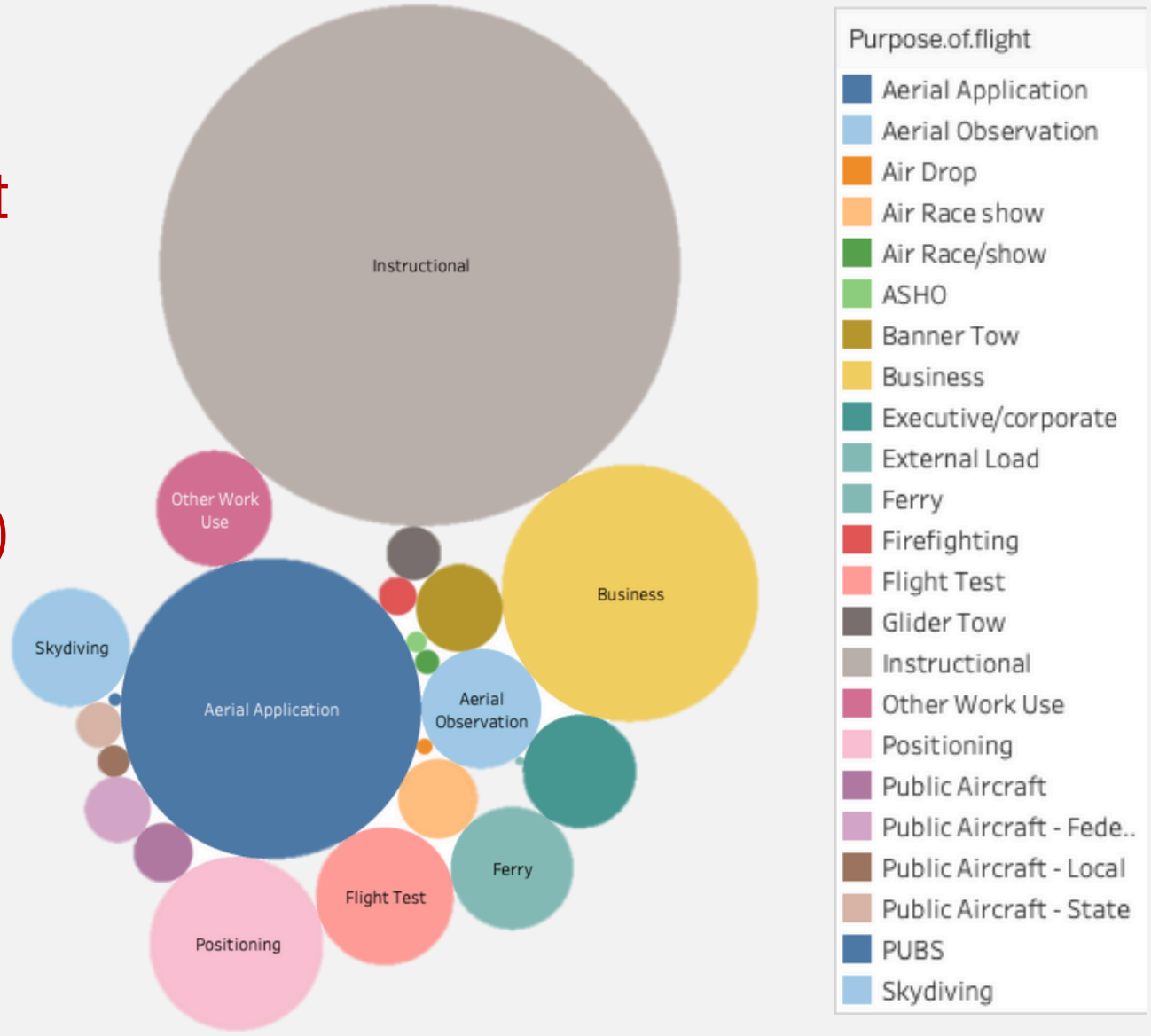
Focus & Accuracy: Ensuring focused data collection and implementing data checks guarantees relevance and accuracy.



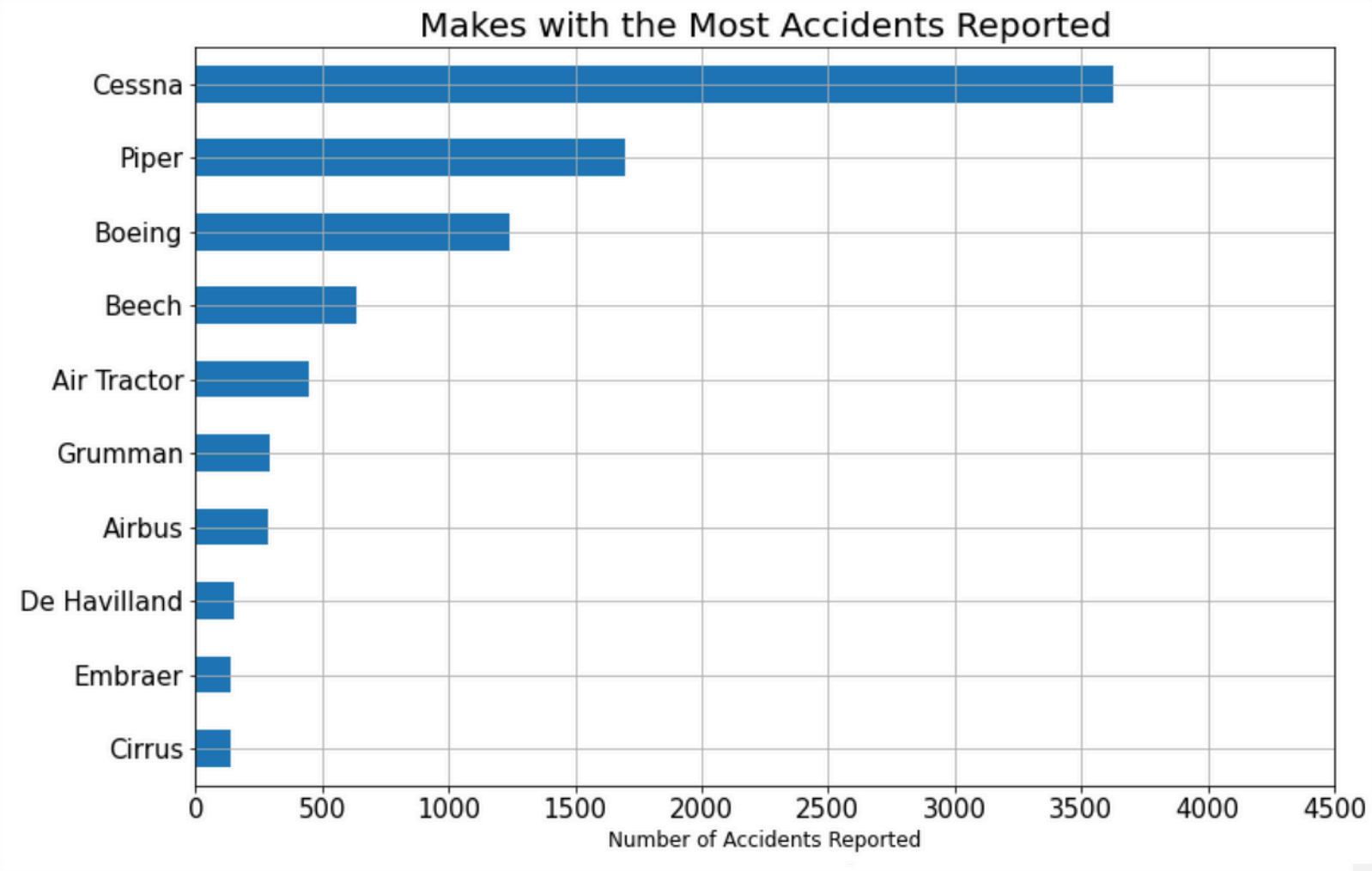
WHAT WERE THE AIRPLANES DOING?

Most common flight purposes that resulted in accidents:

1. Flight Instruction
2. Aerial Application (Crop Dusting)
3. Business



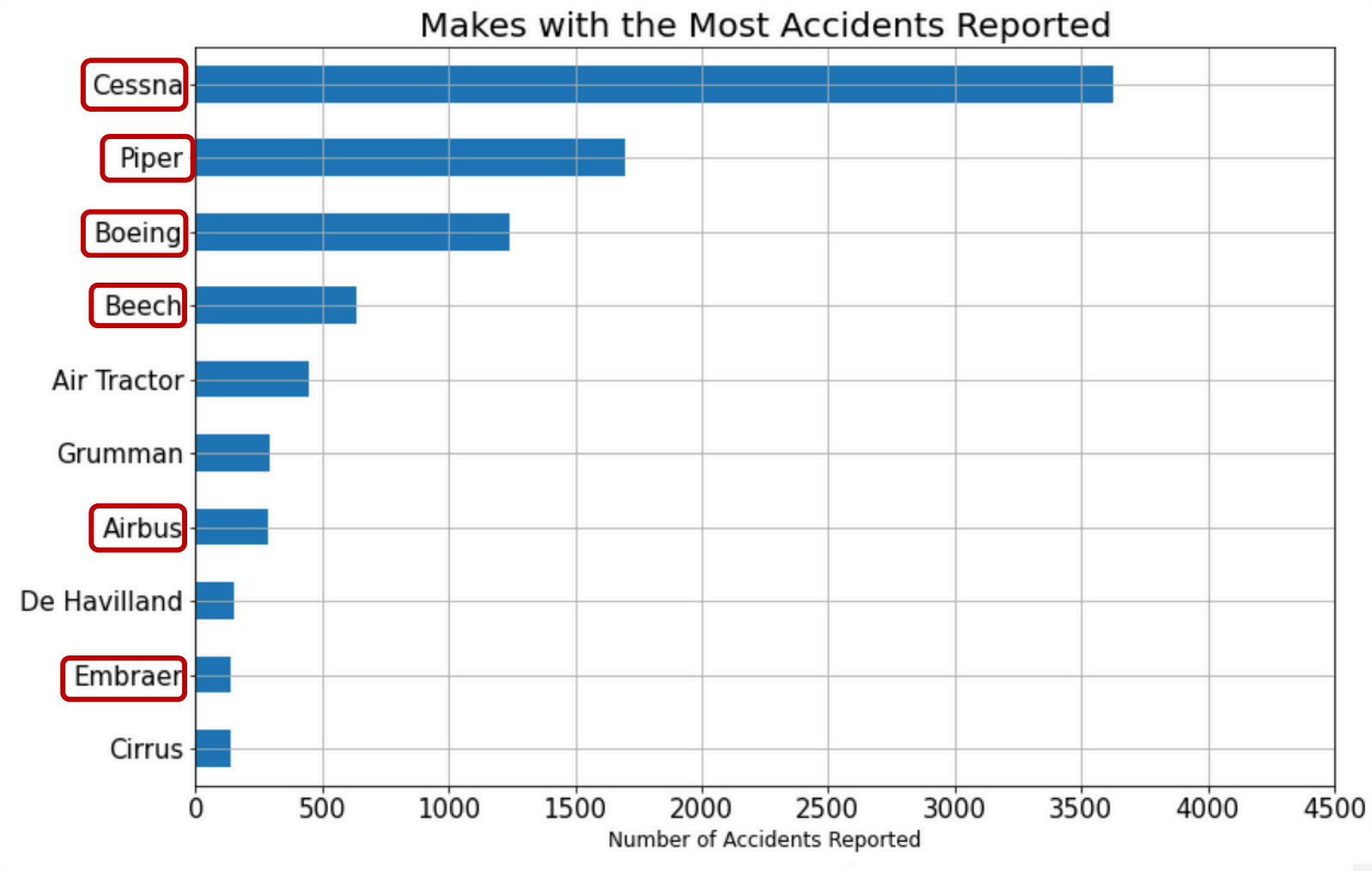
airplane manufacturers have the worst safety records



Top 3 Makes:

1. Cessna
2. Piper
3. Boeing

How do airplane manufacturers compare in terms of safety performance?



Top 5 Commercial Makes:

1. **Boeing (USA)**
2. **Airbus (Netherlands)**
3. **Embraer (Brazil)**
4. Bombardier (Canada)
5. Comac(China)

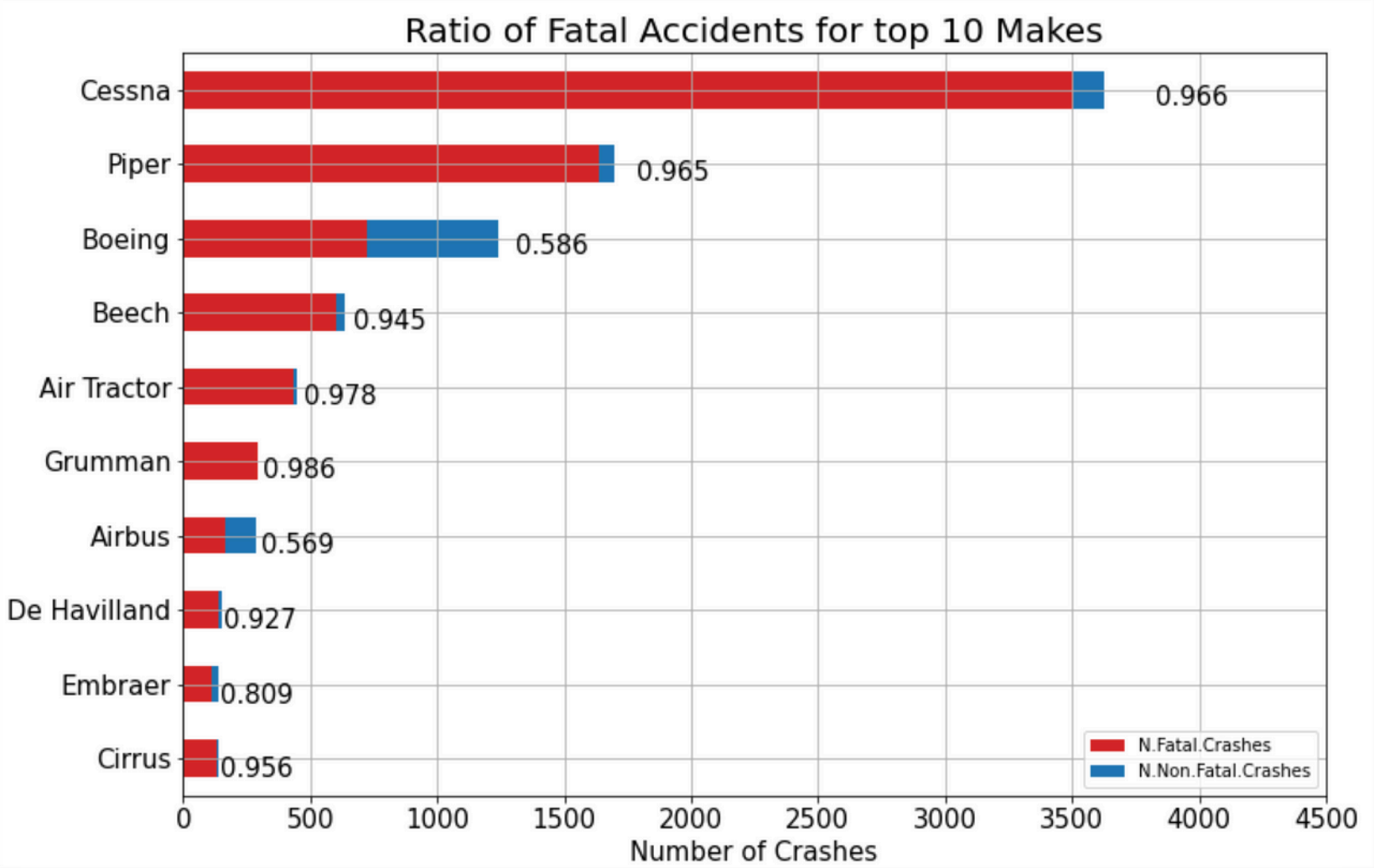
Top 5 Private Makes:

1. **Airbus Corporate Jets (France)**
2. **Boeing Business Jets (USA)**
3. Bombardier Business Aircraft (Canada)
4. **Beechcraft (USA)**
5. **Cessna (USA)**

General Aviation “Big 3”:

1. **Cessna**
2. **Beechcraft**
3. **Piper**

Number of fatalities associated with these incidents.

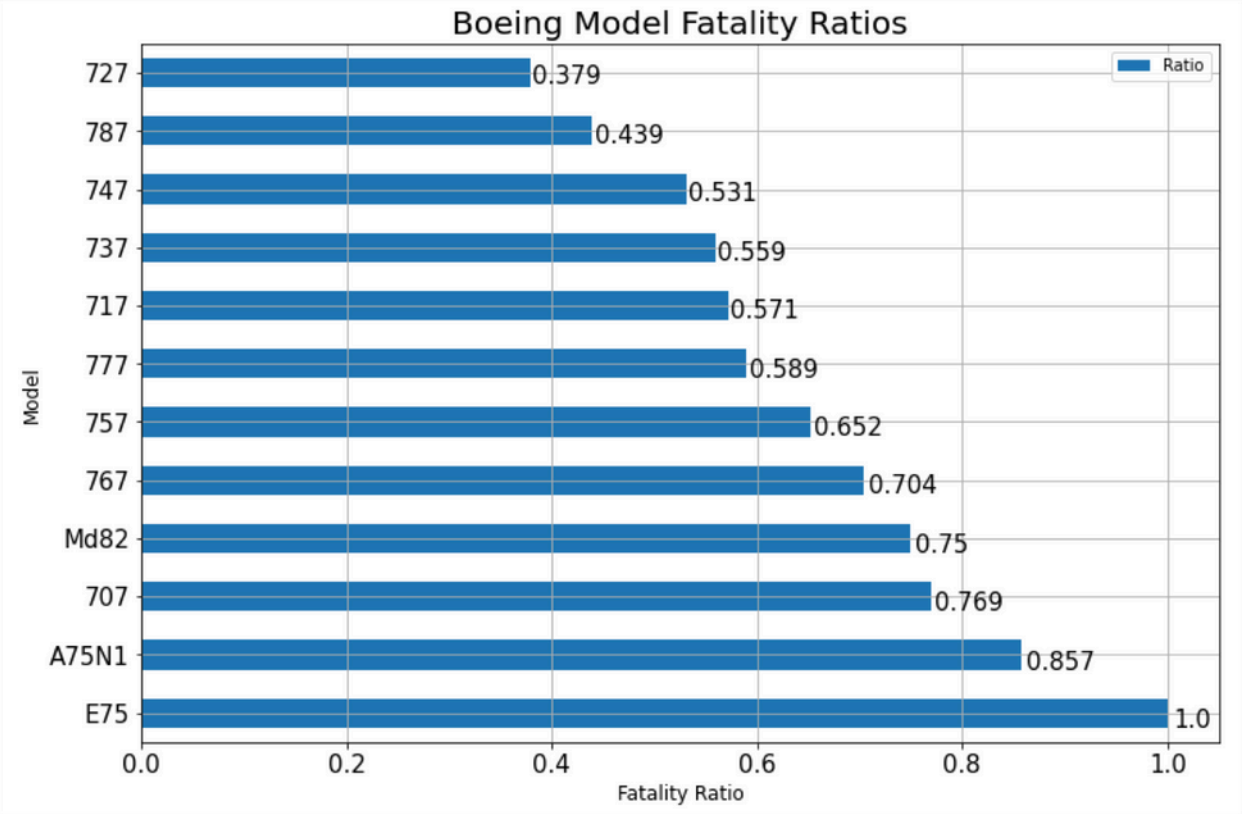


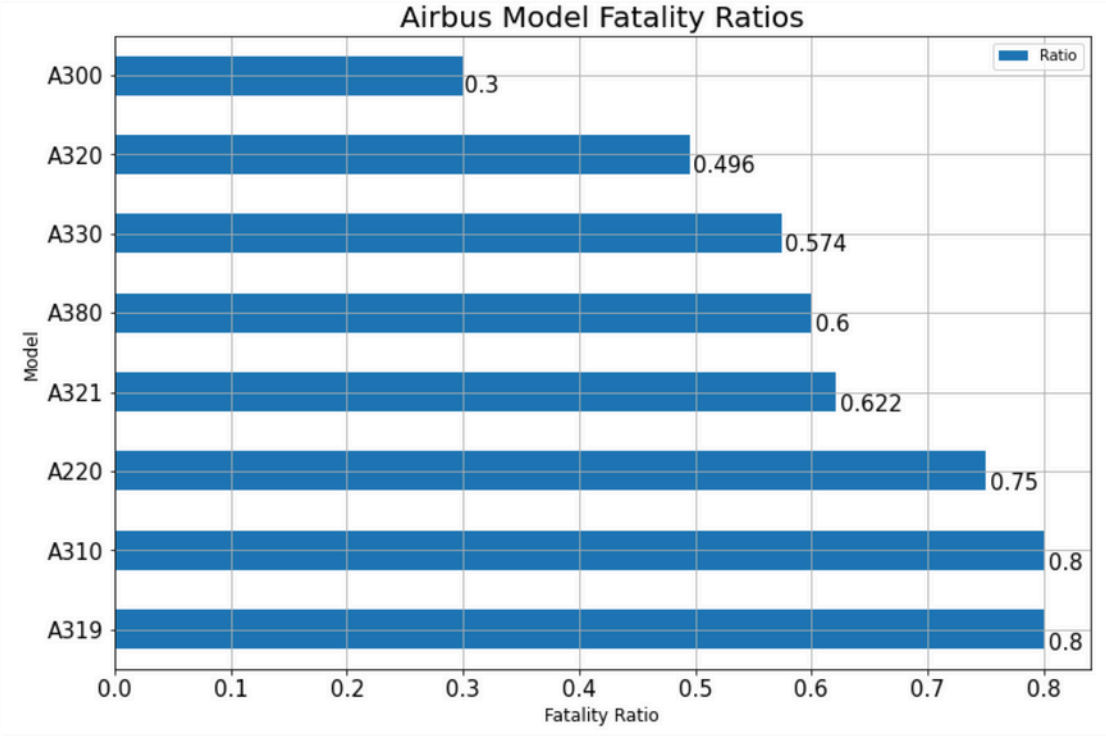
$$\text{Fatality ratio} = \frac{\#\text{ fatal crashes}}{\text{total crashes}}$$

Most Makes:
fatality ratios above 0.9
(>90% fatal)

Boeing and Airbus:
fatality ratios below 0.6
(<60% fatal)

Safest Boeings & Airbus
LOWEST FATALITY RATIOS



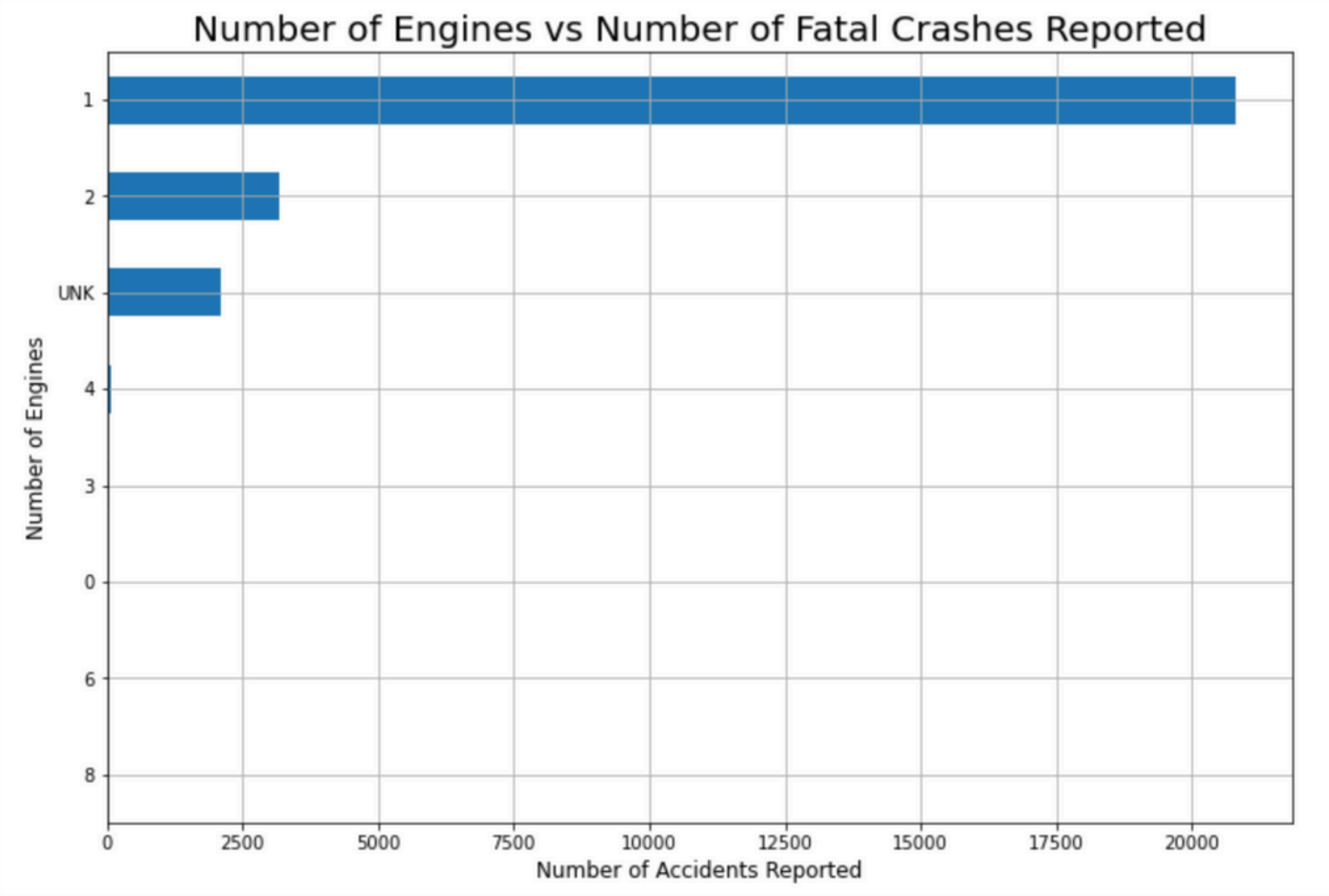


Each Make has 2 models with fatality ratios below 0.5:

- Boeing: 727, 787
- Airbus: A300, A320

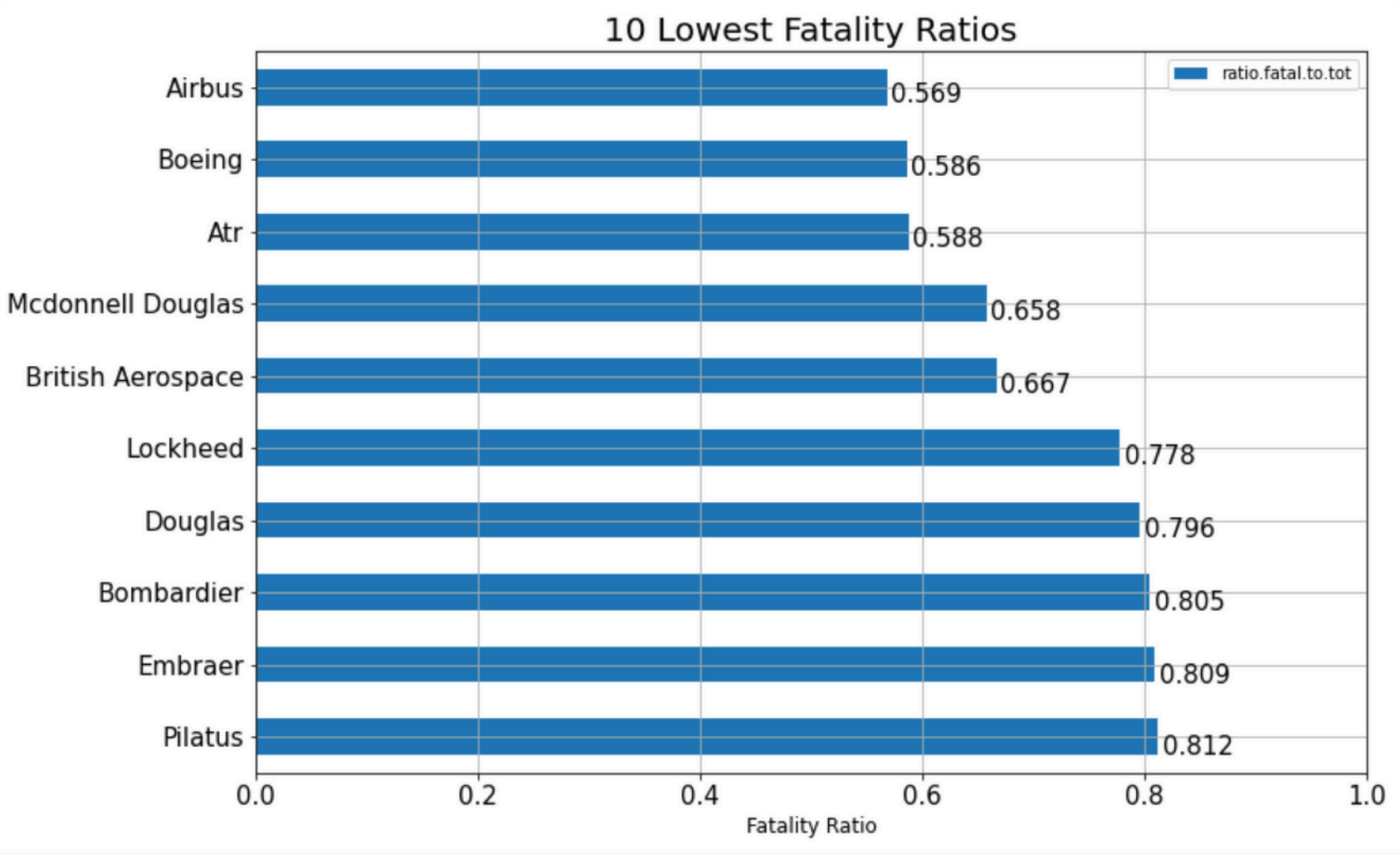
Higher Risk engines that lead to many fatalities

Shorthand for Airplane size



Small, single engine planes crashes produce the most fatalities

Safety-Centric Manufacturers:
Manufacturers with a history of safe operations.

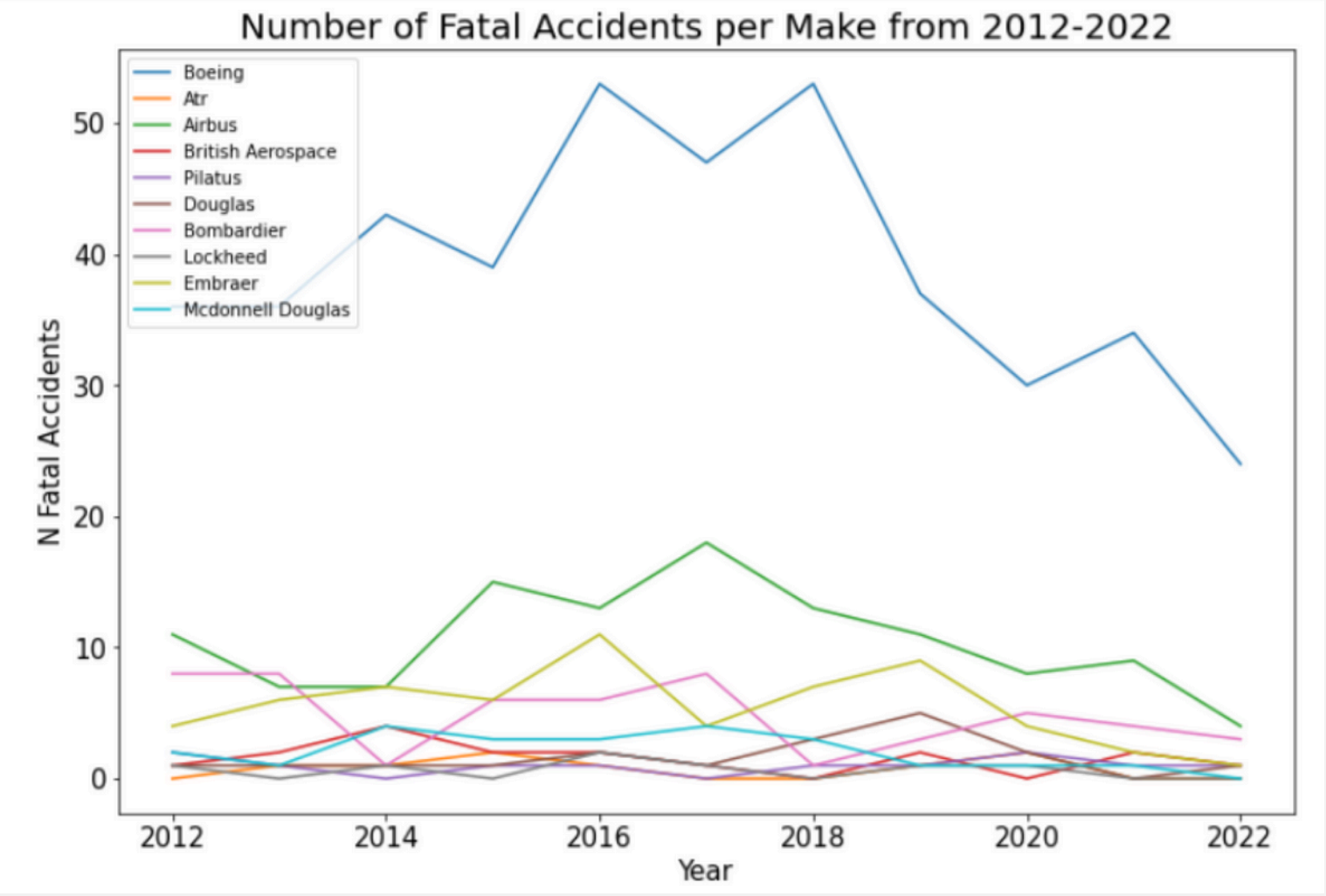


Boeing and Airbus:

- Large, reputable manufactures
- Lowest fatality ratios

Continuous Improvement:

Manufacturers with a strong record of safety enhancements.



Improvements over the last 10 years

Looking at the 10 makes with the lowest fatality ratio

Overall Trend: Not much improvement

Boeing: Significant reduction in fatalities since 2018

Airbus: Reduction in fatalities sins 2017

CONCLUSIONS

1. *Avoid Instructional and Aerial Applications*
2. *Boeing and Airbus have the best safety record*
    - *Best models: Boeing 727 & 787, Airbus A300 & A320*
3. *Avoid single engine planes*

RECOMMENDATIONS

Determine Airplane Requirements

- What cargo will we be transpor ting?
- What size of plane is necessar y?
- Are specialty planes required?

Individual Manufacturer Due Diligence

- Which manufacturer has the most planes in the sky?
- Which manufacture has the best crash / total flight ratio?

END OF PRESENTATTION

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