

AA Solutions

AVIATION PROJECT

Presented by: Andy Shen, Andrei Hushcha





OUR TEAM

Andy Shen

Git Hub Lead,
Presentation
Lead

Andrei
Hushcha

Tech Lead



AGENDA

01

Business Problem

02

Data

03

Results

04

Recommendations

05

Future Investigations





BUSINESS PROBLEM

- Investing in the Aircraft Industry

Determine which manufacturer is the lowest risk for both the private and commercial sector

- Analyze accident data to understand fatalities & risks

The Data

- The National Transport Safety Board (NTSB) Report
 - civil aviation accidents & incidents from 1962 – present
 - United States & international waters
- ~13,000 event records
- Limitations:
 - Data does not include total flight hours

Breaking it Down

- Professionally manufactured airplane
- Successful production run is 15–20 years
- Top 5 commercial manufacturers*
 - Boeing, Airbus, Embraer, Bombardier, Mitsubishi
- Top 5 private manufacturers*
 - Beechcraft, Cessna, Dassault, Gulfstream, Piper
- Created fatality rate as a main value centered around the lowest risk criteria

ANALYSIS

The Typical Event

Private Manufacturer:

- Accident with substantial aircraft damage
- In the middle of summer between Wednesday and Thursday
- Aircraft: Cessna 172 with one reciprocating (piston) engine
- Passengers: 2 persons on board with a high probability of 1 person being a fatal injury



Cessna 172

The Typical Event

Commercial Manufacturer:

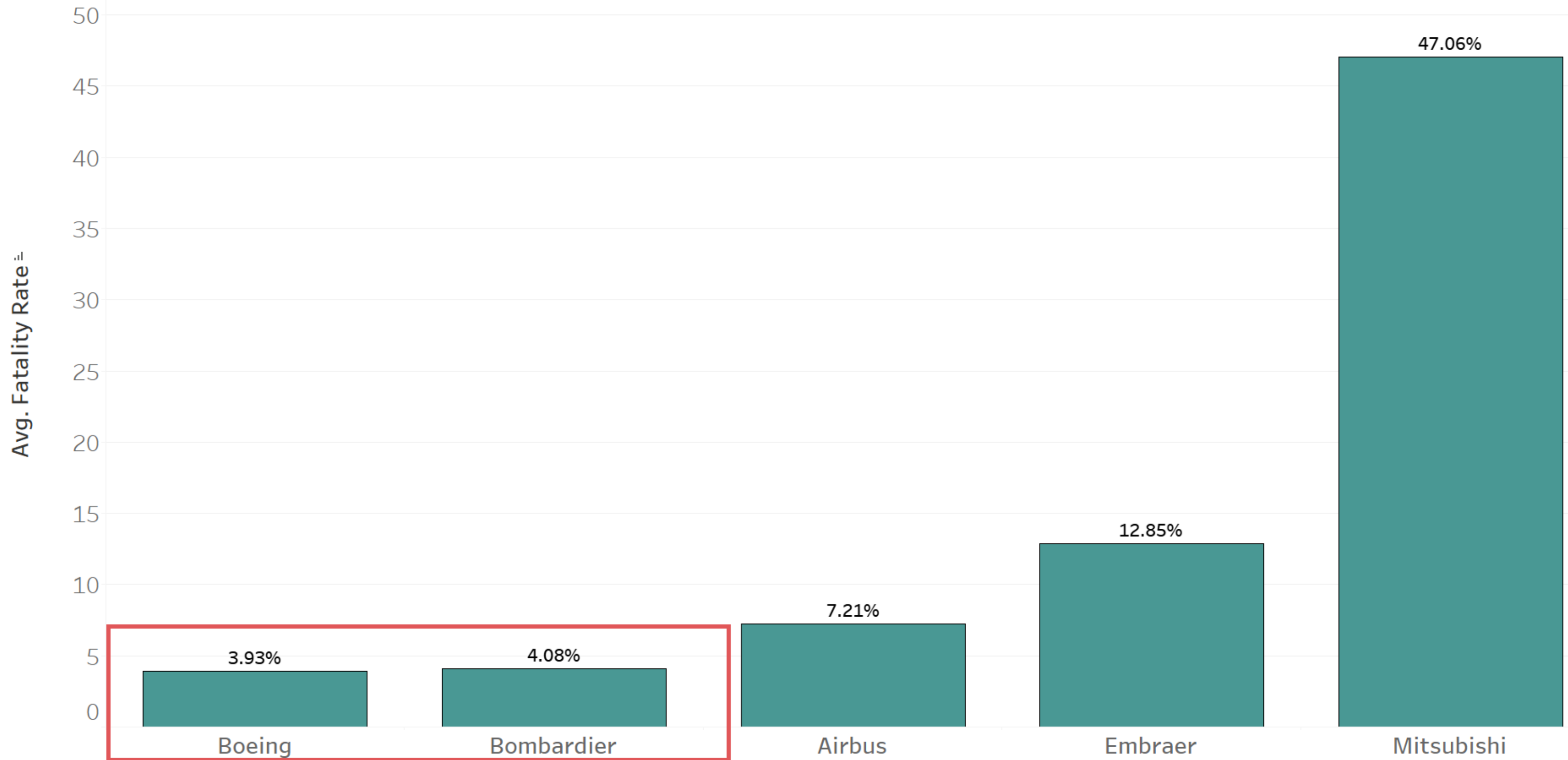
- An incident with unknown type of damage (inclining to minor)
- In the middle of summer between Tuesday and Wednesday
- Aircraft: Boeing 737 with 2 turbo fan engines
- Passengers: 68 passengers on board with 65 uninjured, 2 dead and 1 with serious or minor injury



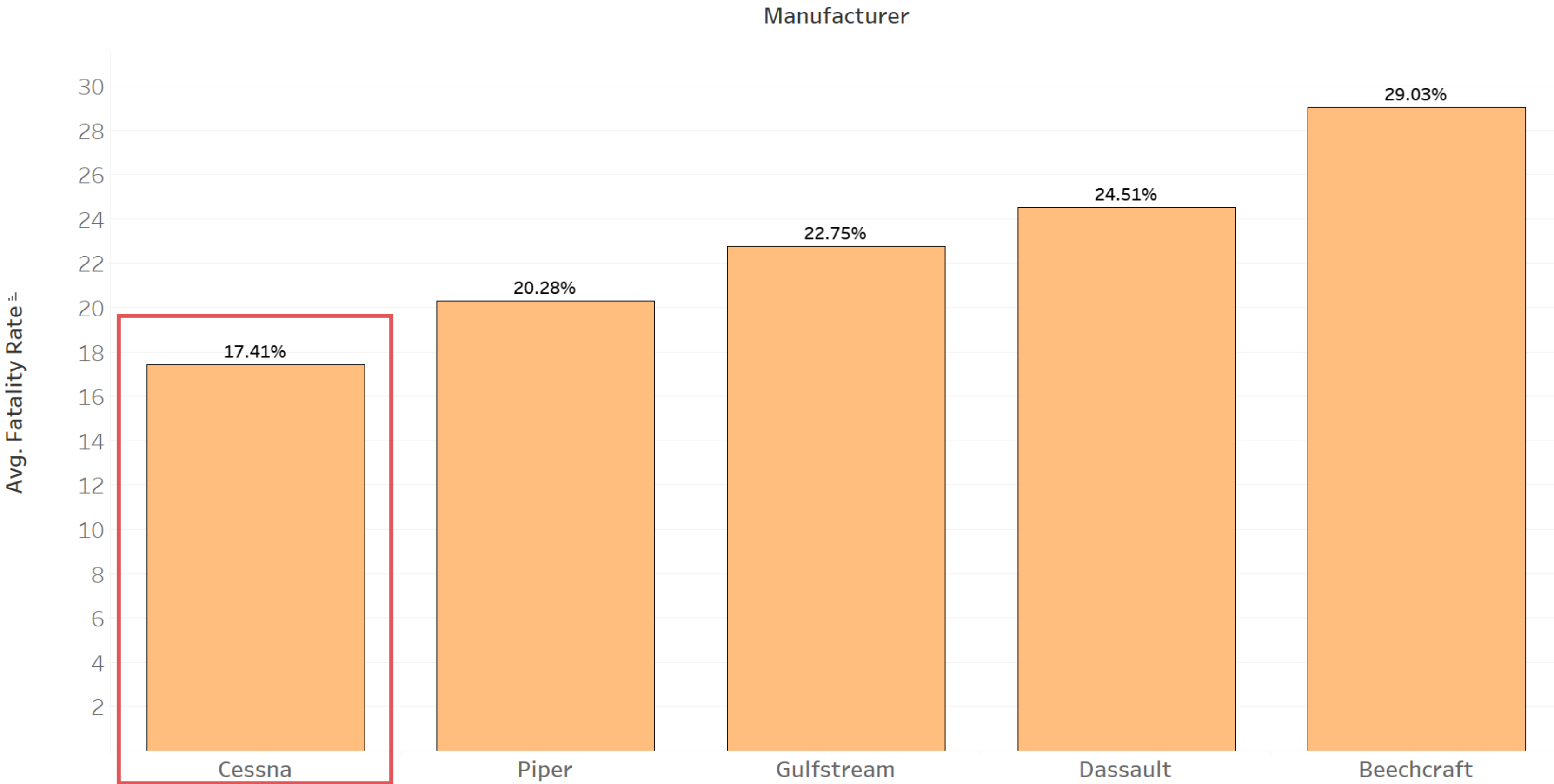
Boeing 737

Fatality Rate by Commercial Manufacturers

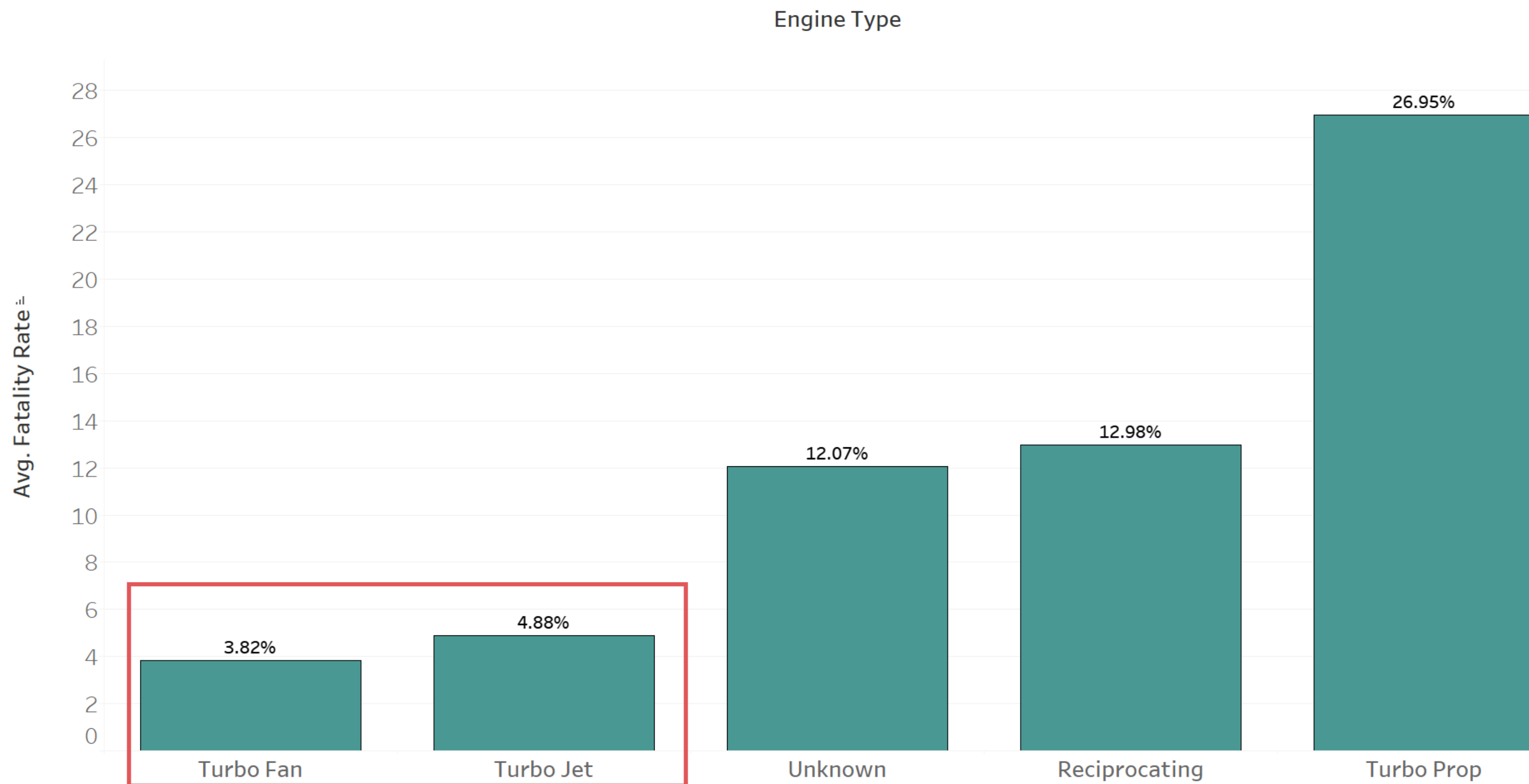
Manufacturer



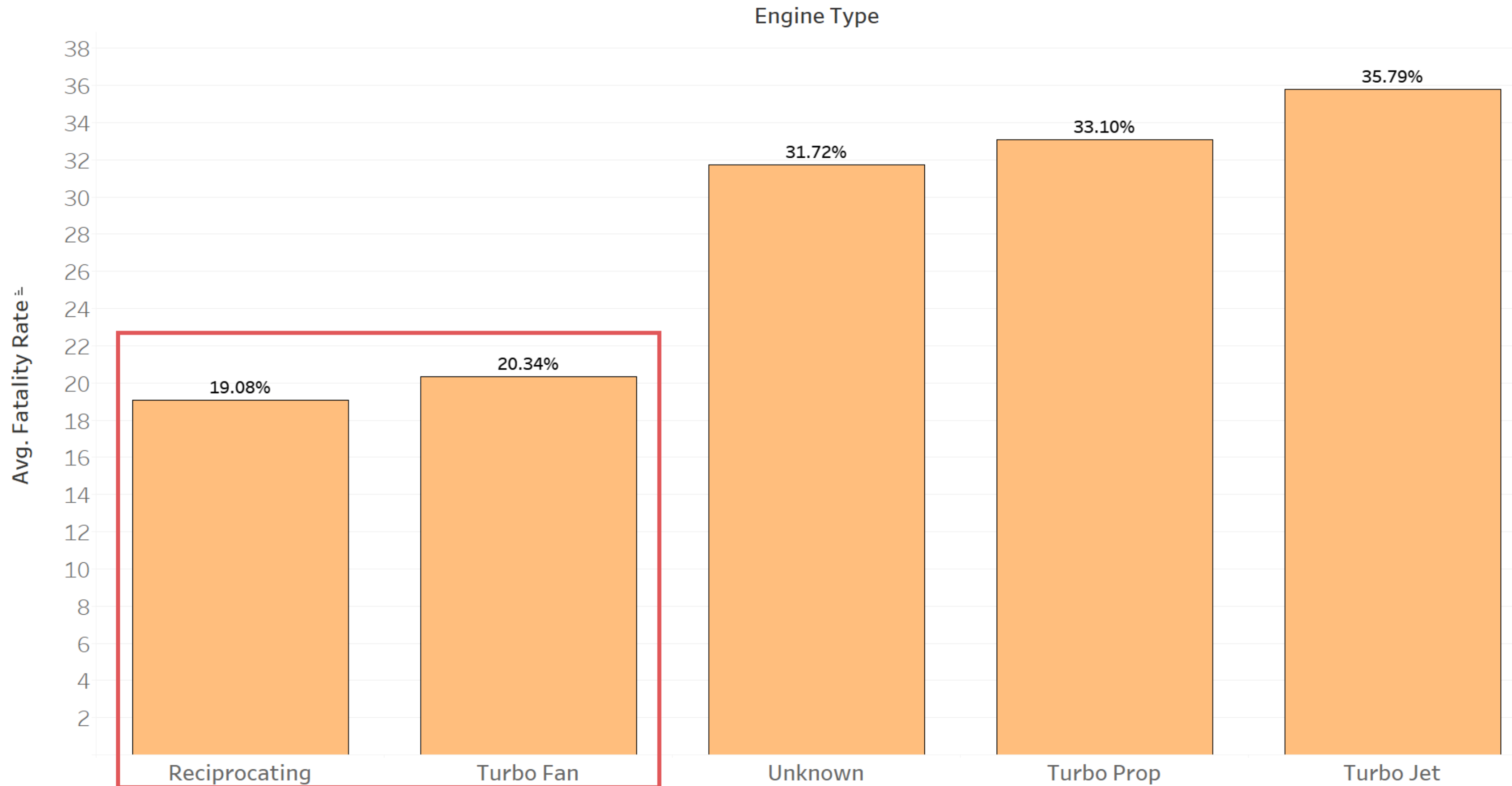
Fatality Rate by Private Manufacturers



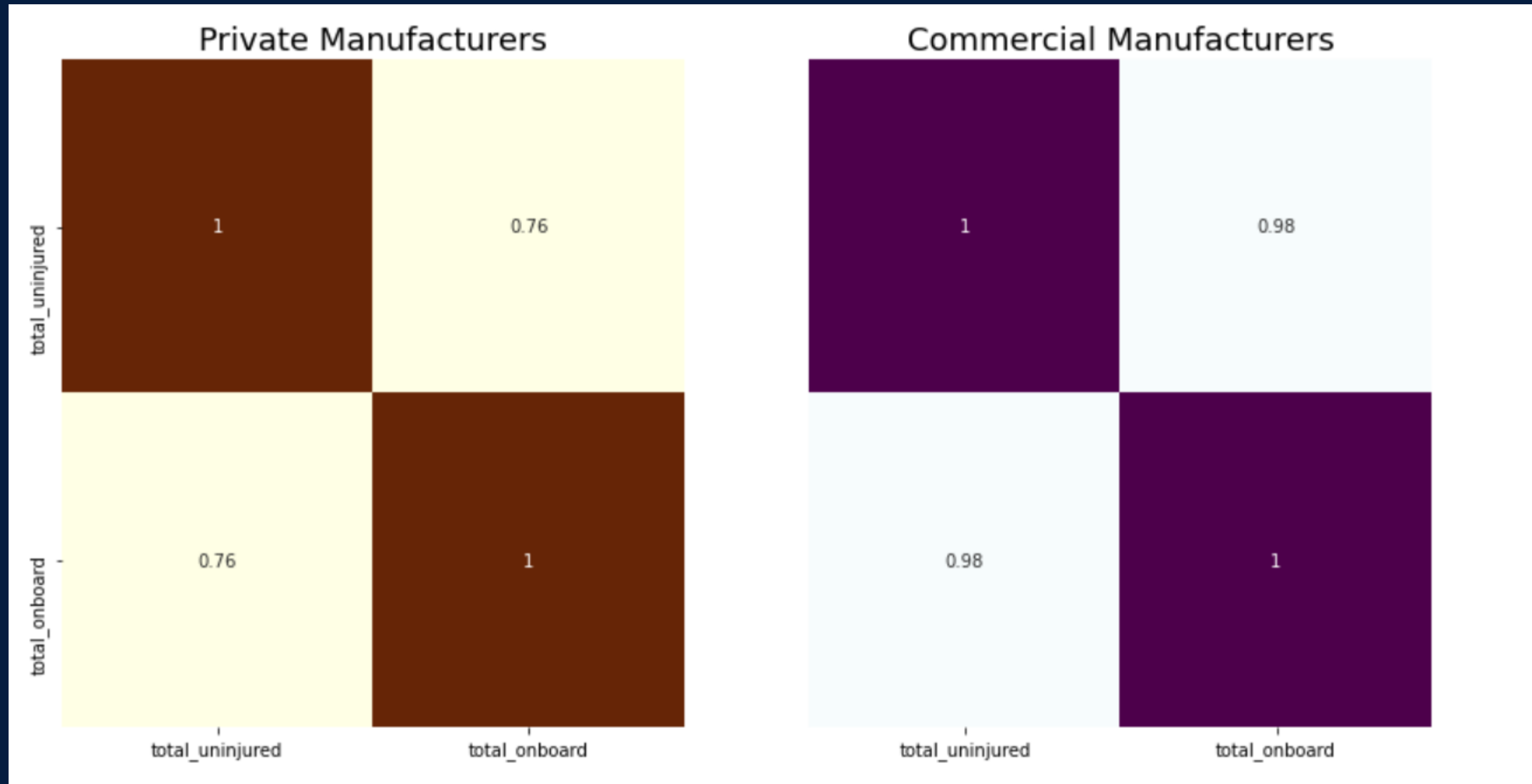
Fatality Rate by Engine Type in Commercial Manufacturers



Fatality Rate by Engine Type in Private Manufacturers



Correlation between total and uninjured passengers



Recommendations:

- Makes:
 - Commercial: *Boeing* or *Bombardier*
 - Private: *Cessna*
- Engine Type:
 - Commercial: *Turbo Fan & Turbo Jet*
 - Private: *Reciprocating & Turbo Fan*
- Size matters:
 - The **bigger** the safer

Future Insights

- Weigh financial options between top 2 commercial and private manufacturers
- Gather further flight information to expand analysis

Questions?

Appendix

- **Top Manufacturers:**
 - <https://assetsamerica.com/aircraft-manufacturers/>
- **The National Transport Safety Board (NTSB) Report**
 - <https://www.kaggle.com/datasets/khsamaha/aviation-accident-database-synopses>