Minimizing Risk in Aircraft Operation

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Phase 1 Project

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Overview

Due to the nature of aircraft operation, risk cannot be entirely avoided.

However, there are steps that businesses can take to minimize risk.

This analysis focuses on minimizing risk by three main factors:

- **Plane make and model**
- **Weather conditions**
- **Phase of flight**

Business Understanding

Passenger safety should be of utmost important in the business's decision, as a fatal accident could have catastrophic effects on the business's:

- **Finances**
- **Reputation**
- **Company Morale**

Data Understanding

The dataset utilized for this analysis was obtained from the National Transportation Safety Board.

It contains information about more than 90,000 civil aviation accidents in the US from 1948-2022.

Data Understanding

Features analyzed include:

- **Plane make and model**
- **Number of fatal injuries**
- **Number of serious injuries**
- **Number of minor injuries**
- **Number of uninjured passengers**
- **Weather Condition**
- **Phase of flight**

Data Analysis Methods

- Data cleaning:
  - Removed entries with no information about passenger outcomes
  - Removed nonsensical entries

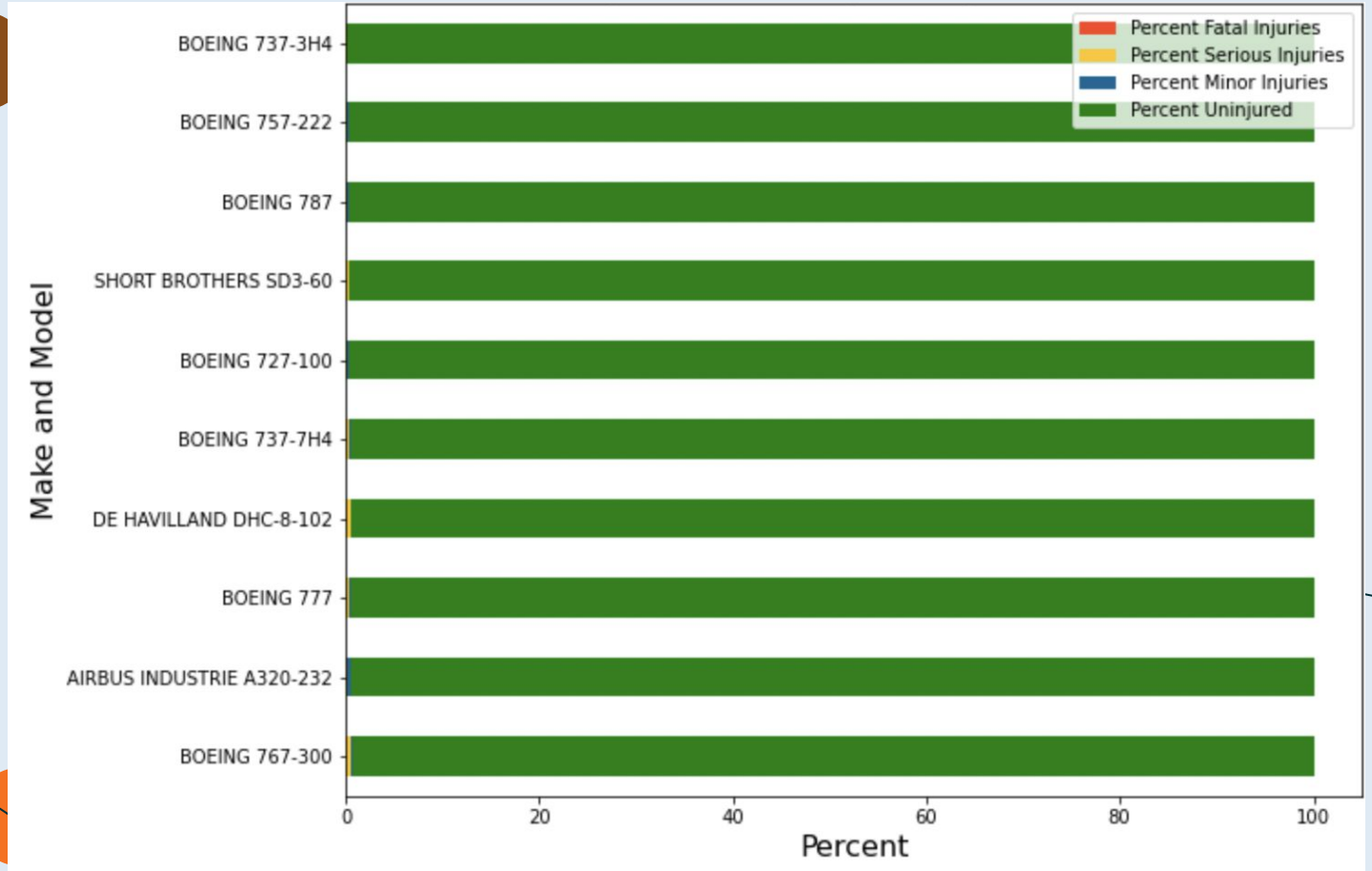
- Data filtering:
  - Considered plane make and models with data for:
    - 10+ flights
    - 50+ passengers

Data Analysis Methods

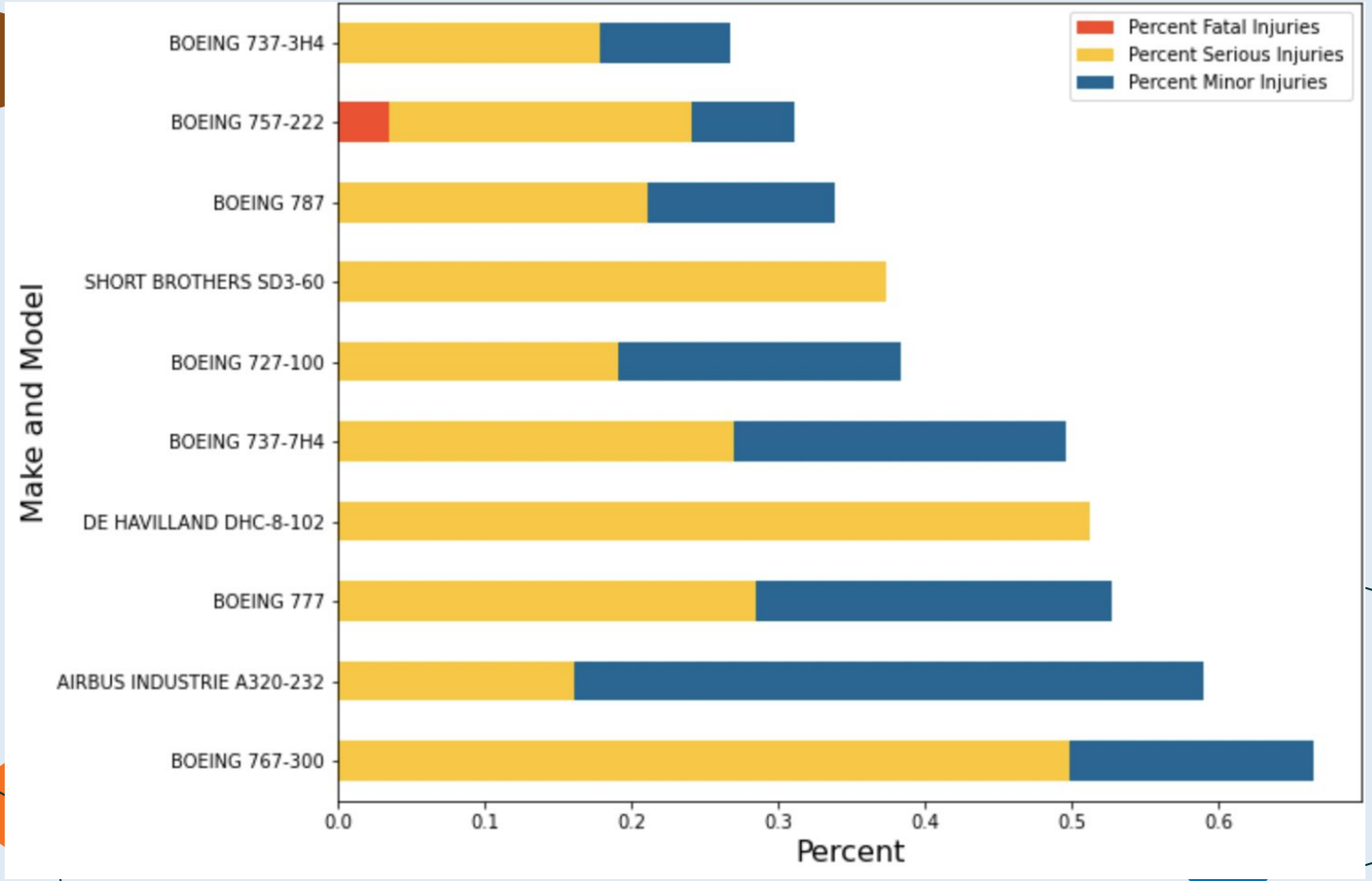
- Grouped data by:
  - Plane make and model
  - Weather condition
  - Phase of flight

- Safety was evaluated by:
  - Fatal, serious, and minor injuries
  - Uninjured passengers

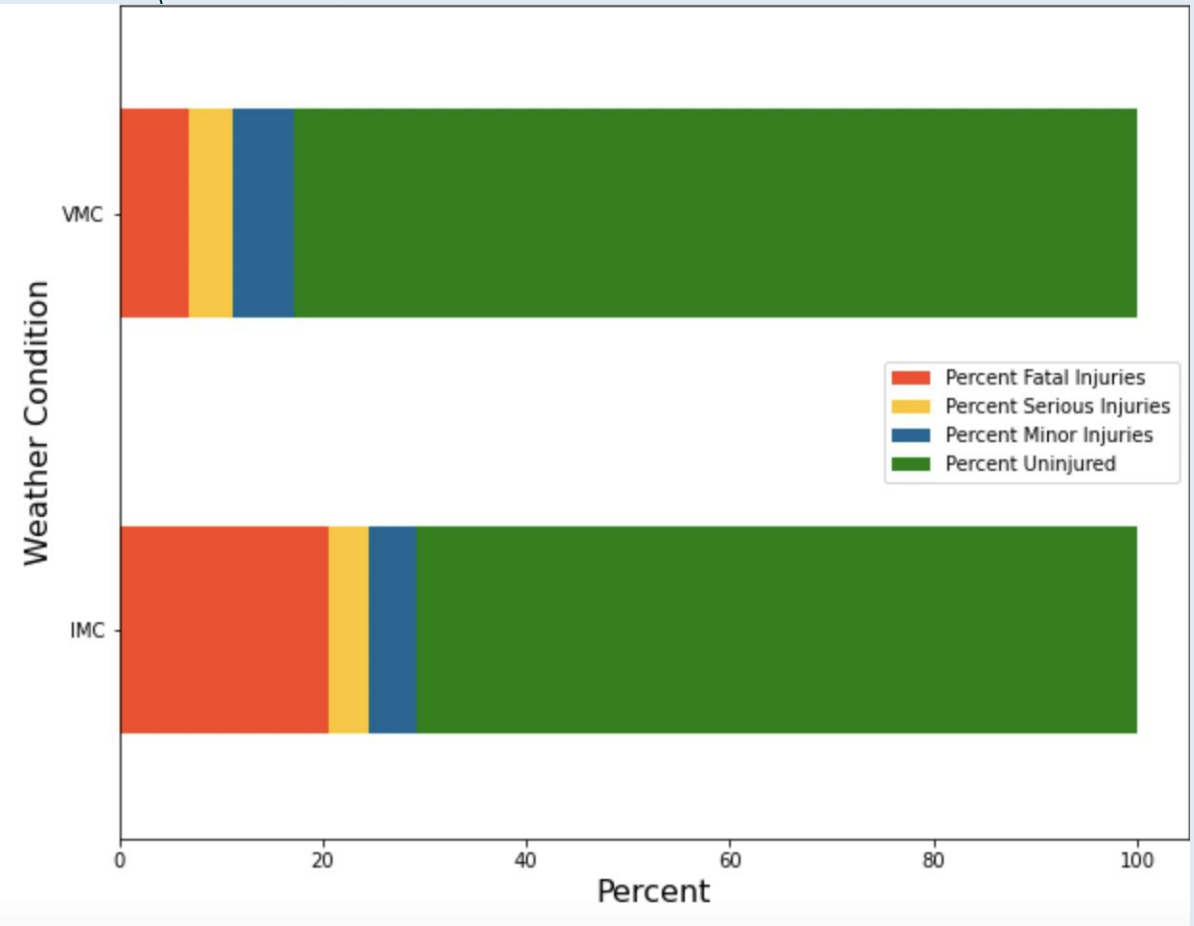
Percent Injured and Uninjured by Make and Model



Percent Injured by Make and Model



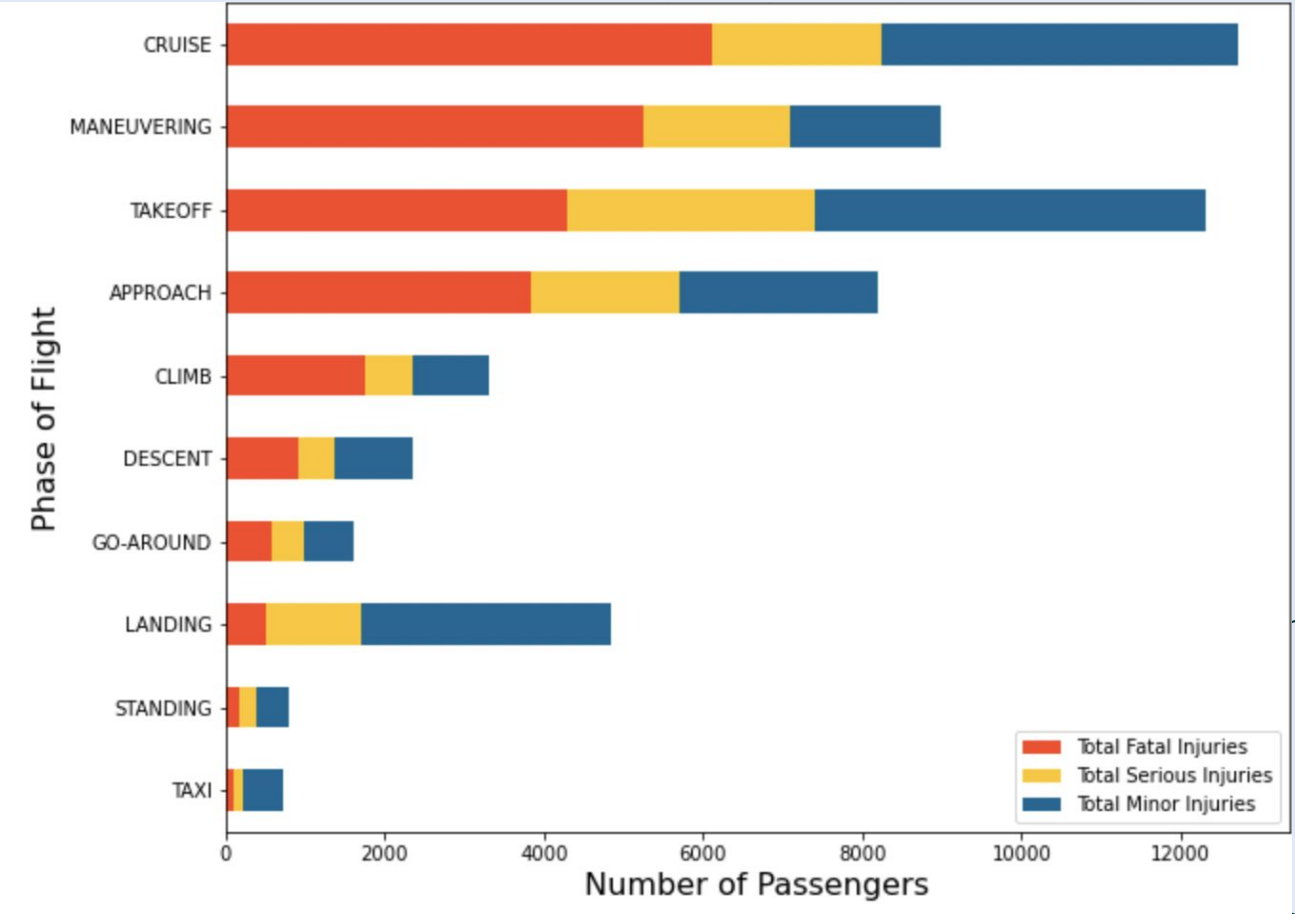
Percent Injured by Weather Condition



VMC: Visual Meteorological Conditions

IMC: Instrumental Meteorological Conditions

Total Injuries by Phase of Flight



Recommendations

To maximize passenger safety, the business should:

- Operate a plane with low fatality and injury rates (ideally, the Boeing 737-3H4)

- Fly only in weather that meets criteria for visual meteorological conditions

- Provide additional training to pilots in the most dangerous phases of flight: cruise, takeoff, and maneuvering

Next Steps

- Analyze data of all civil aviation events (not accidents exclusively)
- Evaluate impact of pilot expertise on passenger safety
- Consider effects of plane size (engines & number of passengers) on safety

Thank you!

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