

Minimizing Risk in Aircraft Operation

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Phase 1 Project

Flatiron Data Science Flex (June 2023)



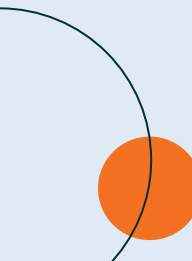
Overview



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**
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Business Understanding



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

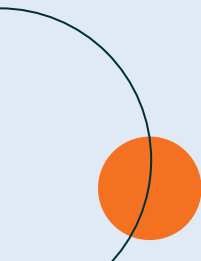
- Finances
 - Reputation
 - Company Morale
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Data Understanding



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

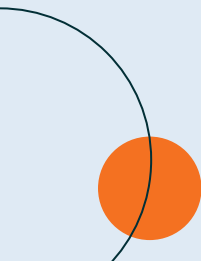
It contains information about more than 90,000 civil aviation accidents in the US from 1948-2022.



Data Understanding

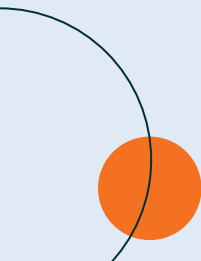


Features analyzed include:

- 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
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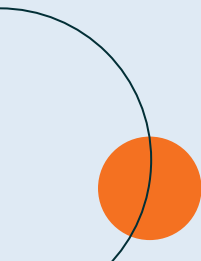
Data Analysis Methods



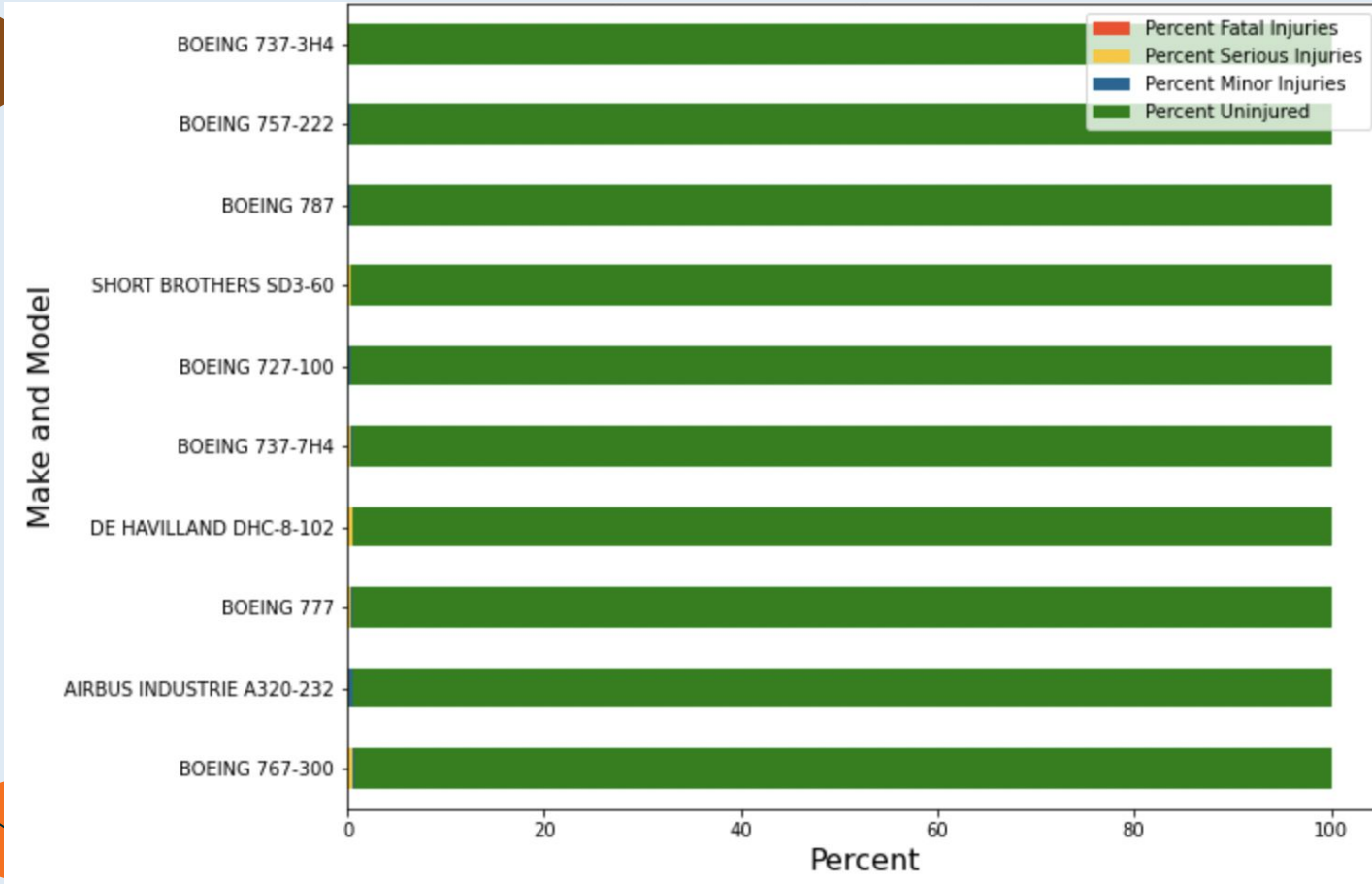
- **Data cleaning:**
 - Removed entries with no information about passenger outcomes
 - Removed nonsensical entries
 - **Data filtering:**
 - Considered plane make and models with data for:
 - 10+ flights
 - 50+ passengers
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Data Analysis Methods

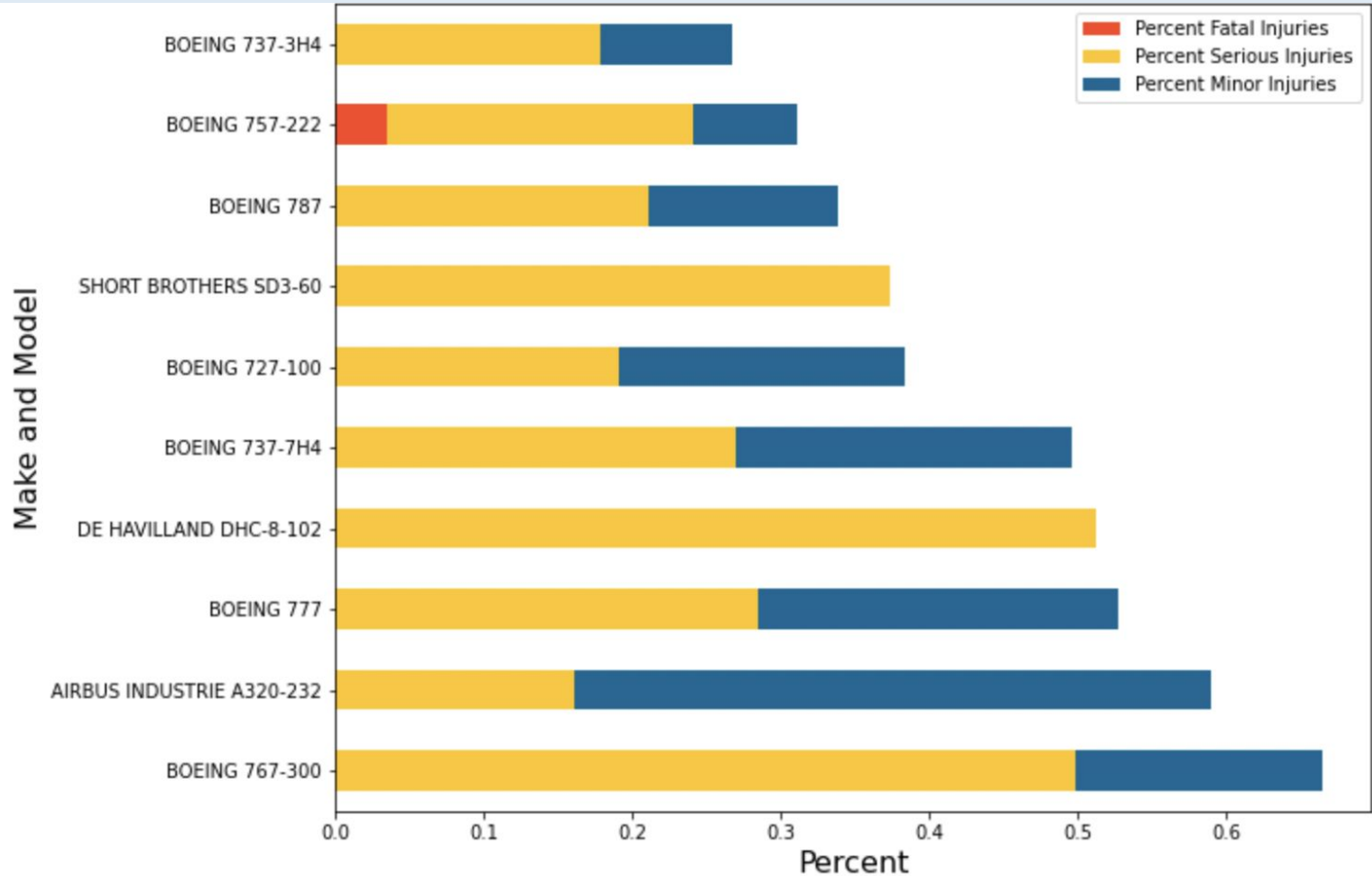


- Grouped data by:
 - Plane make and model
 - Weather condition
 - Phase of flight
 - Safety was evaluated by:
 - Fatal, serious, and minor injuries
 - Uninjured passengers
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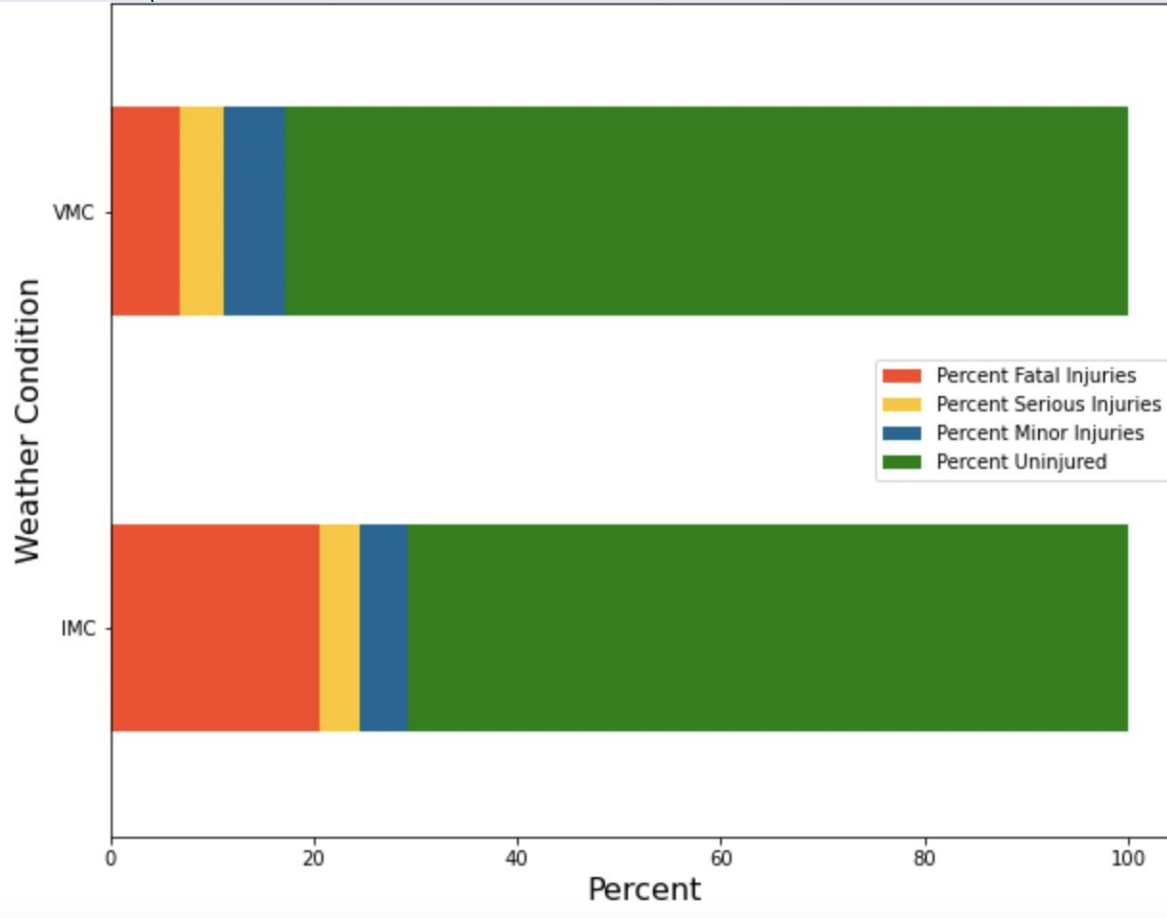
Percent Injured and Uninjured by Make and Model



Percent Injured by Make and Model



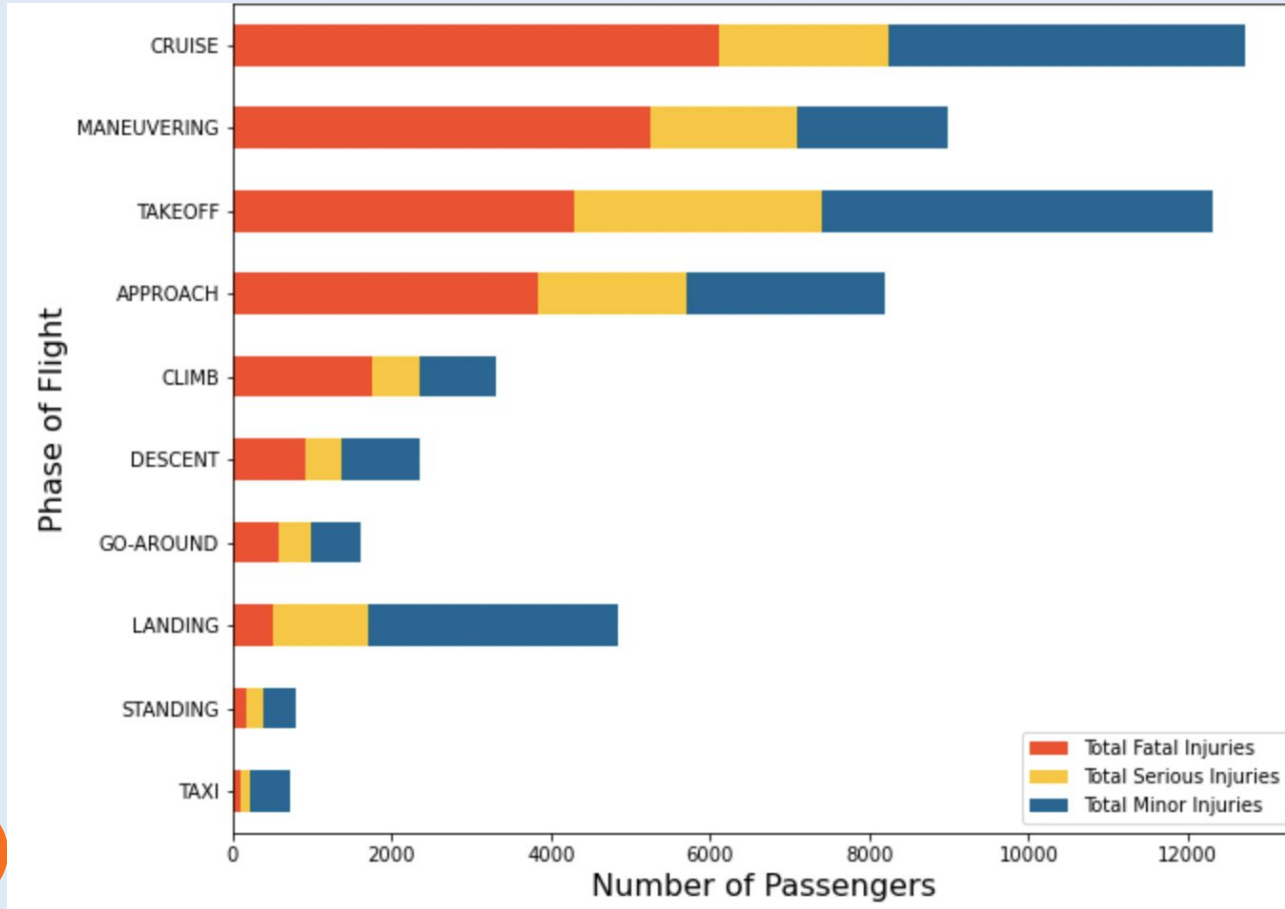
Percent Injured by Weather Condition



VMC: Visible
Meteorological Conditions

IMC: Instrumental
Meteorological Conditions

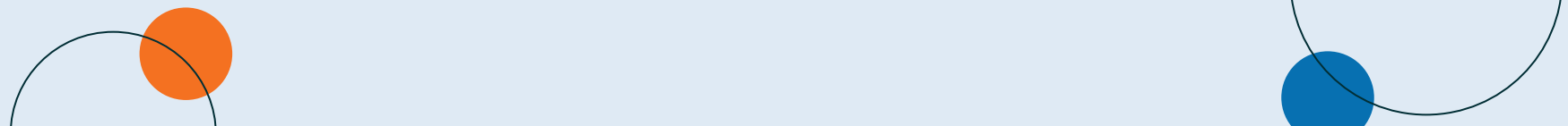
Total Injuries by Phase of Flight





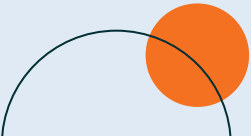
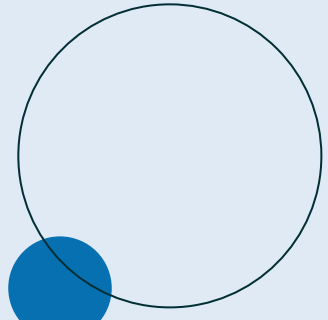
Recommendations

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 visible meteorological conditions
 - Provide additional training to pilots in the most dangerous phases of flight: cruise, takeoff, and maneuvering
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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
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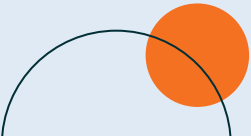
Thank you!

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