Airplane crashes analysis Using Tableau

Internship Project

by

Mentorness

By

Mounika S

On May 2, 2024

Contents

- Overview of the Project

- Dataset

- Dashboard

- Insights

- Conclusion

Overview of the project

This project focuses on a comprehensive analysis of airplane crashes and fatalities from 1980 to 2023.

It is about to analysing crashes occurred at different places, routes and countries and as well as different aircraft types involved.

Here I am using Tableau, a powerful tool, to study airplane crashes. It helps us see the data clearly and understand its meaning.

With Tableau, we can easily create graphs and charts that display important crash information, such as when and where they occur.

We have six main questions to answer about airplane crashes. These questions help us learn more about how crashes happen and how we can stop them.

Problem statement

- This internship project focuses on conducting a comprehensive analysis of airplane crashes and fatalities spanning from 1980 to 2023. The dataset contains crucial information such as crash dates, locations, operators, flight details, aircraft types, and fatality statistics. The goal is to leverage Tableau for interactive visualizations and in-depth insights to understand patterns, contributing factors, and trends in aviation incidents. The analysis aims to provide stakeholders with valuable information for enhancing aviation safety and mitigating risks.

- **Project Objectives**:
  - Temporal analysis
  - Geospatial analysis
  - Operator Performance
  - Aircraft Analysis
  - Fatality Trends
  - Route Analysis

Dataset

- Date: Date of the airplane crash.
- Time: Time of the airplane crash.
- Location: Location where the airplane crash occurred.
- Operator: Operator or airline involved in the incident.
- Flight #: Flight number associated with the incident.
- Route: Planned route of the flight.
- AC Type: Aircraft type involved in the crash.
- Registration: Registration details of the aircraft.
- cn/ln: Construction or serial number of the aircraft.

- Aboard: Total number of individuals aboard the aircraft.
- Aboard Passengers: Number of passengers aboard the aircraft.
- Aboard Crew: Number of crew members aboard the aircraft.
- Fatalities: Total fatalities in the incident.
- Fatalities Passengers: Number of passenger fatalities.
- Fatalities Crew: Number of crew member fatalities.
- Ground: Casualties on the ground, if any.
- Summary: Brief summary or description of the incident

Dataset changes

- Revised dataset structure to facilitate easier access and analysis of information. That is the data cleaning.

- The changes are done that are created columns from location field by splitting into country and city.

- Implemented measures to ensure accuracy and consistency of data entries.

- Optimized data processing procedures for faster and more efficient analysis and updated data as standardized data format to enhance compatibility and usability across different tools and platforms.

Temporal analysis

- Explore temporal trends in airplane crashes over the years.

- Identify patterns in the frequency and severity of incidents.

- Temporal analysis is focuses on analyzing data over time, here we analyzing data over year from 1980 to 2023, by dragging date into columns shelf as year wise and fatalities on rows by sum. then we can observe that there are more no. of fatalities 2590 on year 1985, and also second time on 1996 with 2314 fatalities. So, studying airplane crashes from 1980 to 2023 helps us understand how incident rates have changed over the years.

Worksheet of Temporal analysis

Temporal analysis
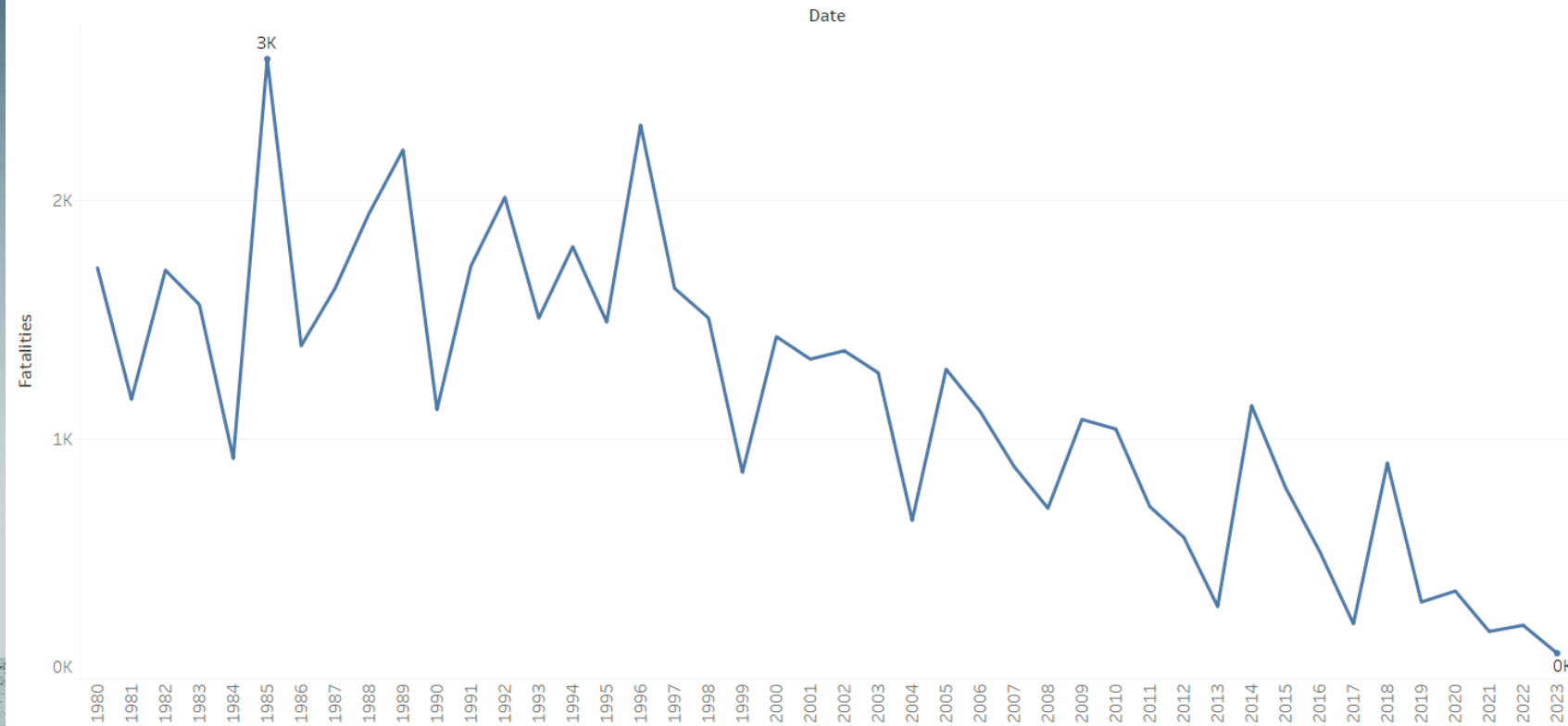
The trend of sum of Fatalities for Date Year. The marks are labeled by sum of Fatalities. The data is filtered on Action (Operator), which keeps 2,264 members. The view is filtered on Date Year and Action (YEAR(Date)). The Date Year filter keeps 44 of 116 members. The Action (YEAR(Date)) filter keeps 116 members.
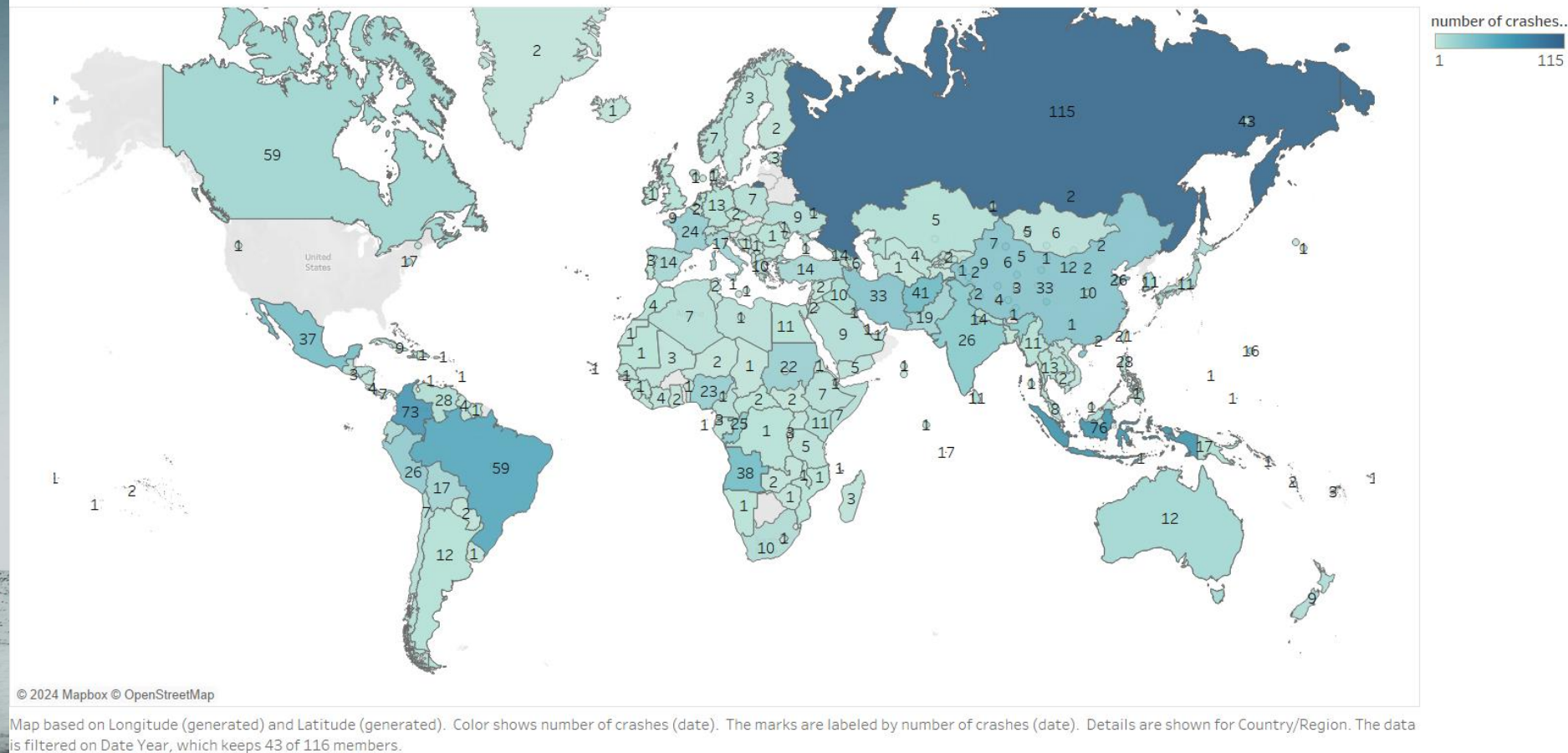
Geospatial analysis

- Visualize crash locations on a map to identify hotspots.
- Analyze the distribution of incidents across different regions.

- The Geospatial Analysis worksheet utilizes geographic data to visualize crash locations on a map, enabling stakeholders to identify hotspots, analyze incident distribution across regions, and gain insights into aviation safety, thereby facilitating the identification of risk factors and the enhancement of safety measures..

Worksheet of geospatial analysis

Geospatial analysis

Map based on Longitude (generated) and Latitude (generated). Color shows number of crashes (date). The marks are labeled by number of crashes (date). Details are shown for Country/Region. The data is filtered on Date Year, which keeps 43 of 116 members.

Operator Performance

- Evaluate the safety records of different operators and airlines.

- Identify operators with higher incident rates.

- The Operator Performance worksheet evaluates the safety records of different airlines, highlighting operators with higher incident rates, and enabling stakeholders to identify areas for improvement in aviation safety practices.
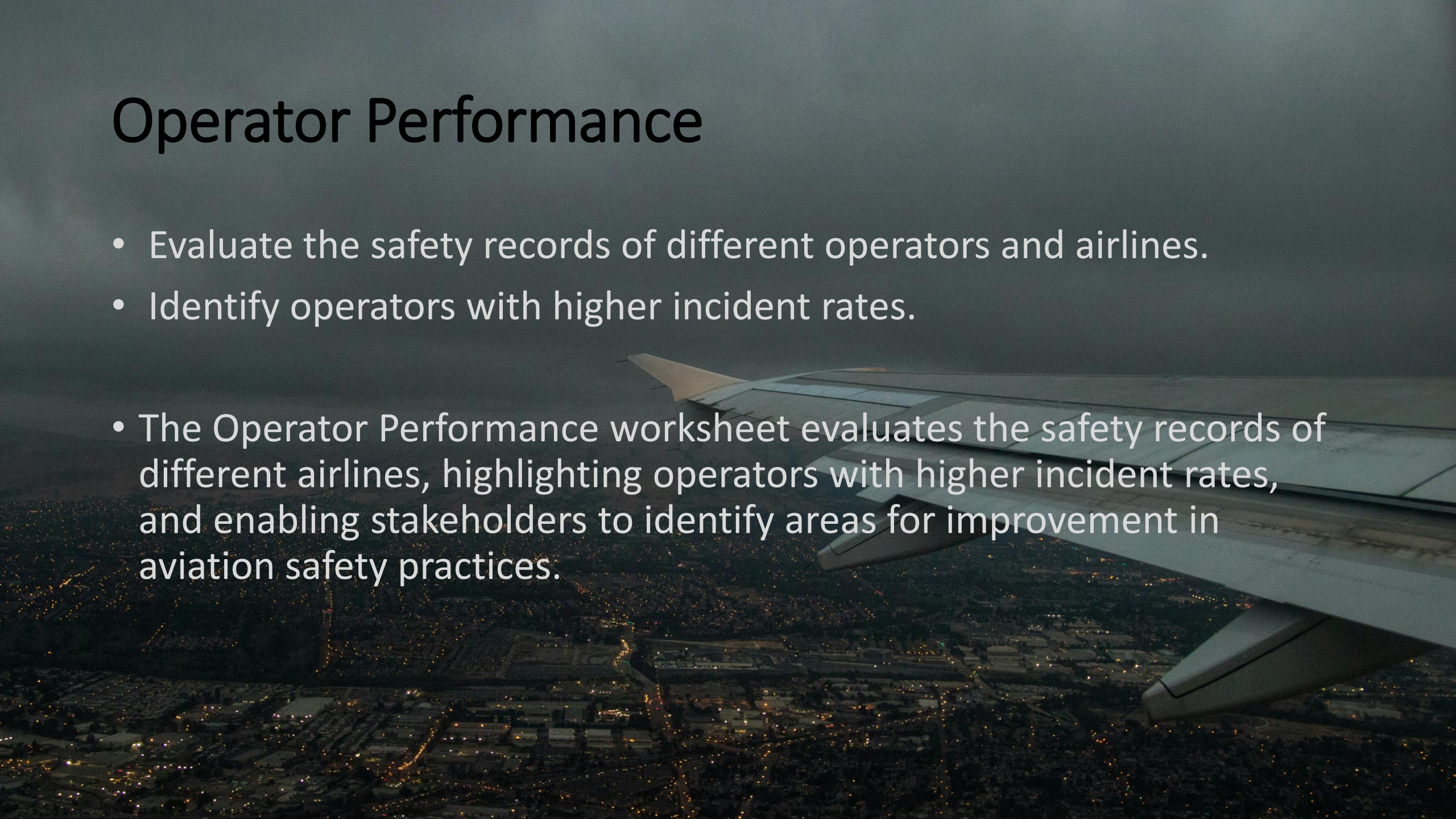
Worksheet of operator performance

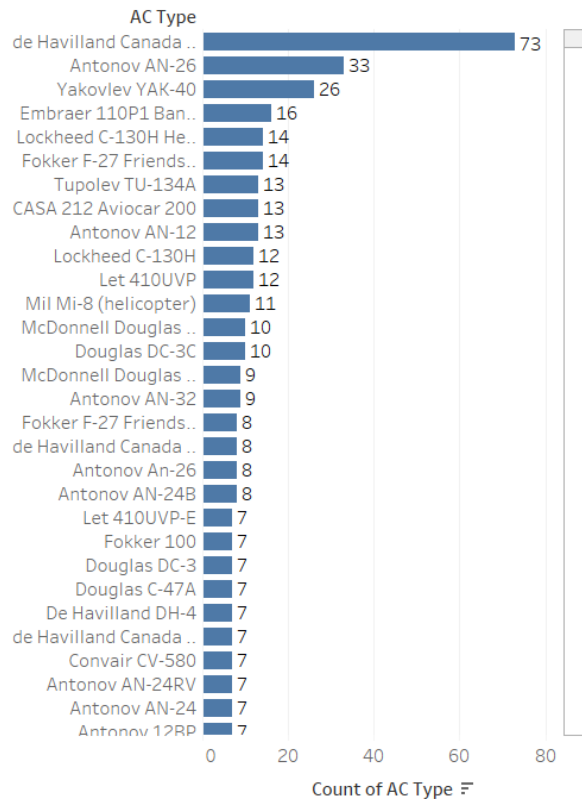
Operator Performance
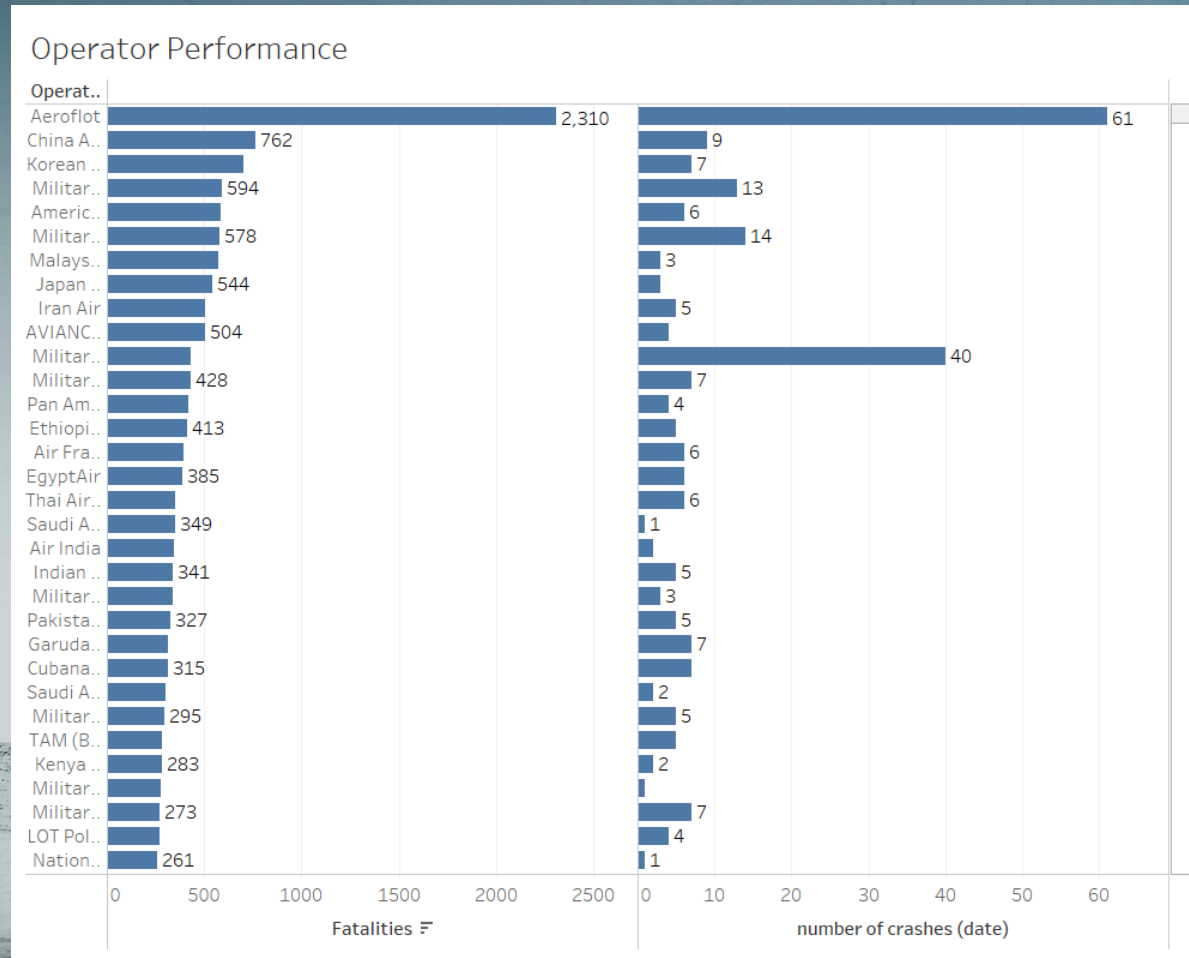
Aircraft Analysis:

- Analyze the involvement of specific aircraft types in incidents.
- Examine the relationship between aircraft registration and crash occurrences

- The Aircraft Analysis worksheet presents information by plotting the types of aircraft involved in incidents on one axis and the frequency of these incidents on the other. This visualization allows stakeholders to see which specific aircraft types are more commonly involved in crashes, providing crucial insights for enhancing safety measures.
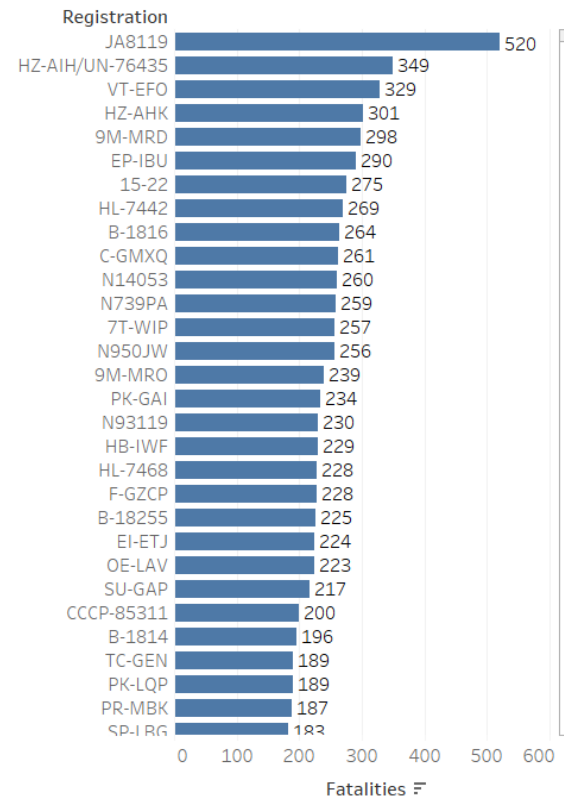
Worksheet of Aircraft Analysis

Aircraft analysis

Number of incidents by AC type

AC Type	Count of AC Type
de Havilland Canada ..	73
Antonov AN-26	33
Yakovlev YAK-40	26
Embraer 110P1 Ban..	16
Lockheed C-130H He..	14
Fokker F-27 Friends..	14
Tupolev TU-134A	13
CASA 212 Aviocar 200	13
Antonov AN-12	13
Lockheed C-130H	12
Let 410UVP	12
Mil Mi-8 (helicopter)	11
McDonnell Douglas ..	10
Douglas DC-3C	10
McDonnell Douglas ..	9
Antonov AN-32	9
Fokker F-27 Friends..	8
de Havilland Canada ..	8
Antonov An-26	8
Antonov AN-24B	8
Let 410UVP-E	7
Fokker 100	7
Douglas DC-3	7
Douglas C-47A	7
De Havilland DH-4	7
de Havilland Canada ..	7
Convair CV-580	7
Antonov AN-24RV	7
Antonov AN-24	7
Antonov 12BP	7

Registraion fatalities

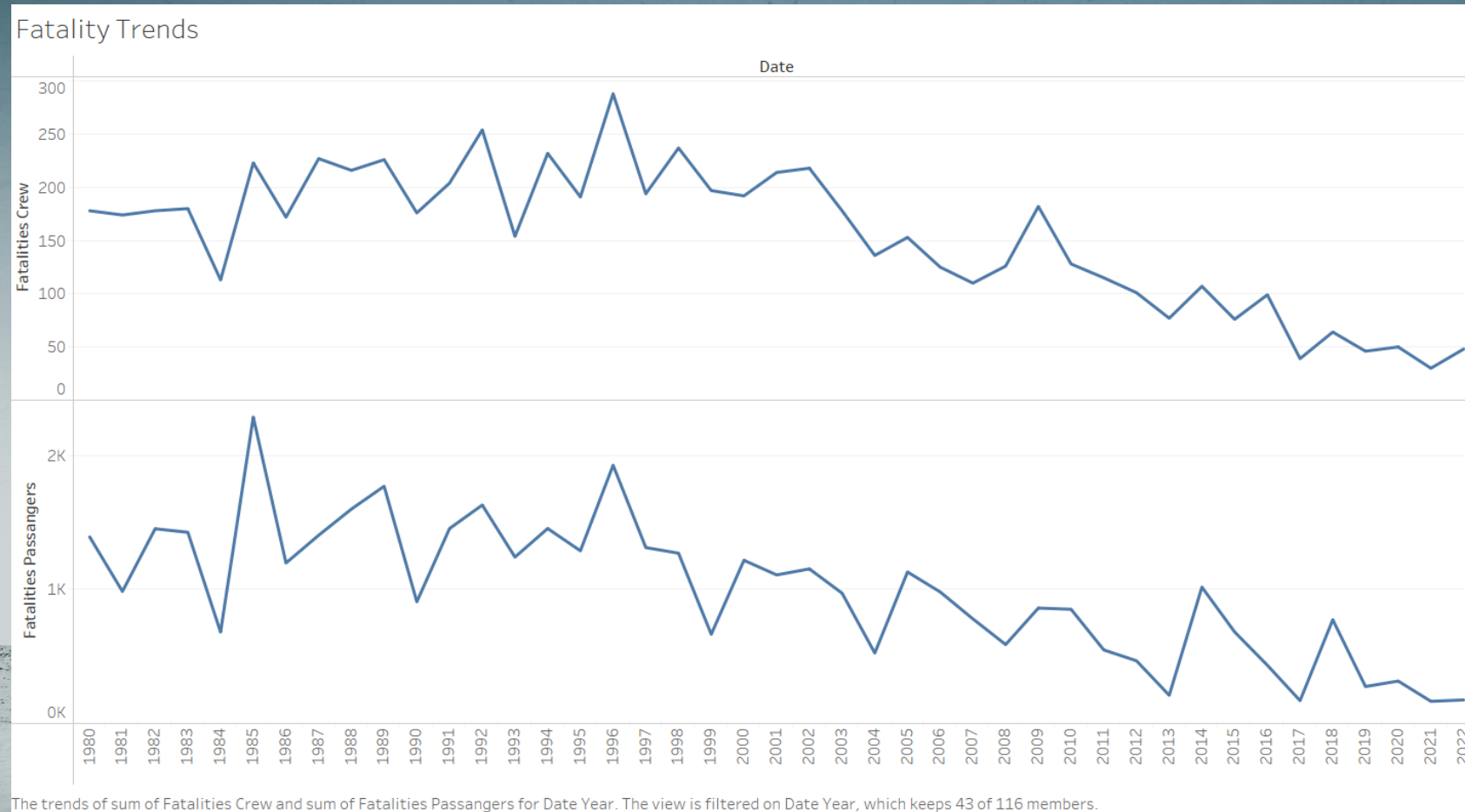| Registration	Fatalities
JA8119	520
HZ-AIH/UN-76435	349
VT-EFO	329
HZ-AHK	301
9M-MRD	298
EP-IBU	290
15-22	275
HL-7442	269
B-1816	264
C-GMXQ	261
N14053	260
N739PA	259
7T-WIP	257
N950JW	256
9M-MRO	239
PK-GAI	234
N93119	230
HB-IWF	229
HL-7468	228
F-GZCP	228
B-18255	225
EI-ETJ	224
OE-LAV	223
SU-GAP	217
CCCP-85311	200
B-1814	196
TC-GEN	189
PK-LQP	189
PR-MBK	187
SP-LBG	183

Fatality Trends

- Explore trends in passenger and crew fatalities.
- Investigate factors contributing to fatalities.

- The Fatality Trends worksheet visualizes the number of passenger and crew fatalities over time, with time (years) on one axis and the count of fatalities on the other. This helps us understand when crashes are most dangerous and find ways to prevent them.
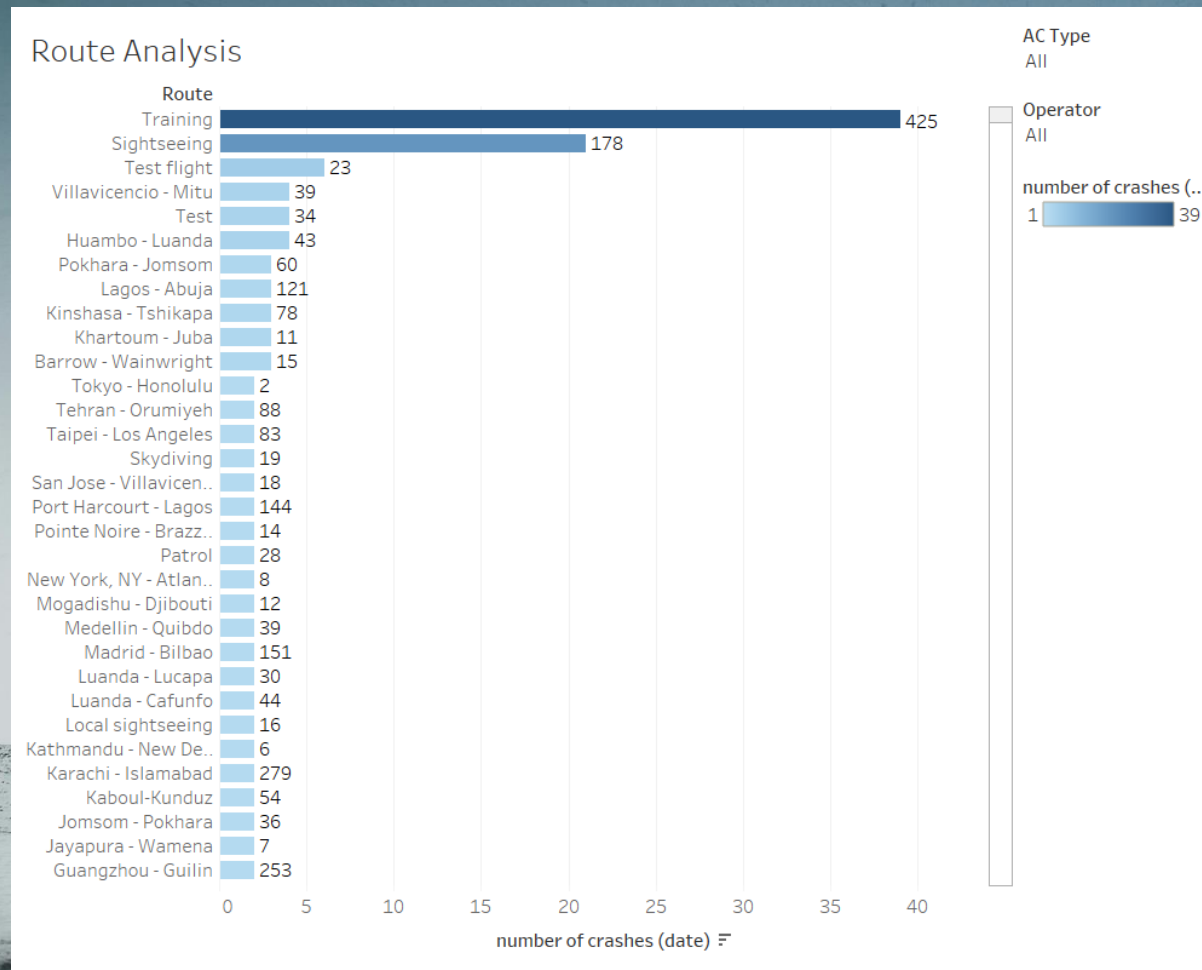
Worksheet of Fatality Trends

Fatality Trends

The trends of sum of Fatalities Crew and sum of Fatalities Passangers for Date Year. The view is filtered on Date Year, which keeps 43 of 116 members.

Route Analysis

- Analyze incident patterns on specific flight routes.

- Identify routes with a higher likelihood of incidents.

- The Route Analysis worksheet displays the frequency of incidents on specific flight routes, with the routes plotted on one axis and the number of incidents on the other. This visualization allows us to identify routes with a higher likelihood of incidents, enabling targeted safety measures to be implemented.

Worksheet of Route Analysis

Overall Dashboard
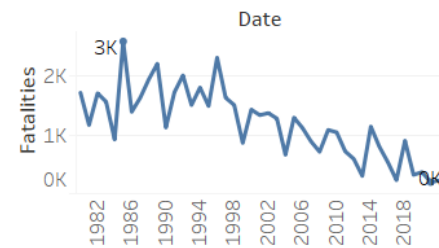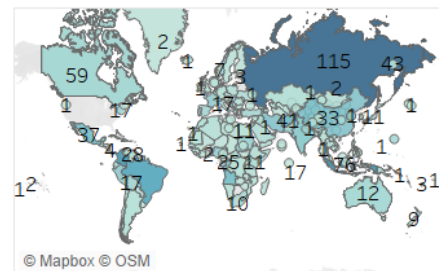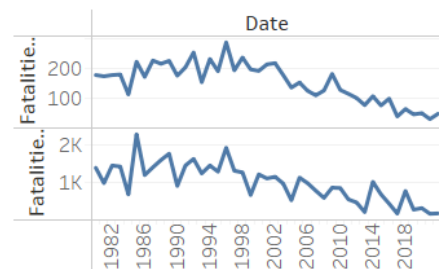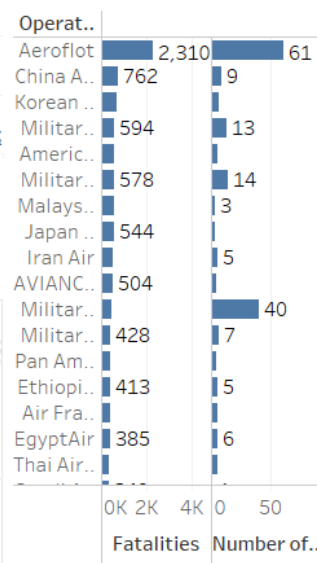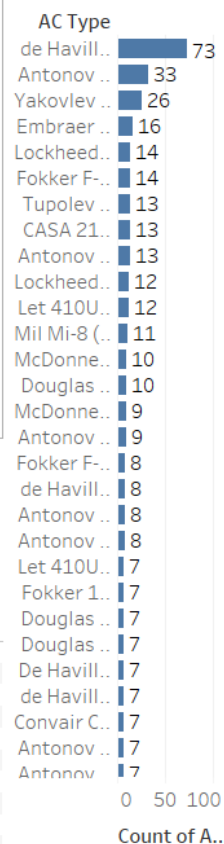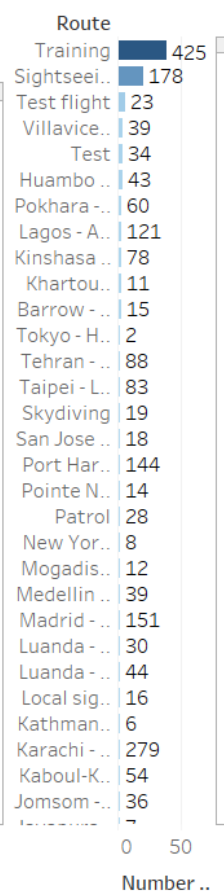
Insights

Our insights reveal critical information about

- Understanding when and where crashes happen helps us make better decisions to keep passengers and crew safe.

- Different airlines have different safety records, so it's important to make sure everyone follows the best safety practices

- Crashes happen more often in certain areas, signaling the need for targeted safety measures there.

- Analyzing crash data helps us prioritize safety efforts and minimize risks for passengers and crew.

Conclusion

In conclusion, Our study gives us important information about airplane safety, uncovering patterns, trends, and contributing factors that impact aviation safety.

- The airplane crashes analysis provides valuable insights into patterns, trends, and contributing factors affecting aviation safety.

- By implementing targeted recommendations, stakeholders can work towards enhancing aviation safety and mitigating risks, thereby ensuring safer skies for all passengers and crew members.

- Our commitment to excellence in safety standards and practices is paramount. Through ongoing evaluation and adaptation, we can uphold the highest levels of safety and reliability in air travel.

Thank you