Airline Incidents Across the World

3-Minute Story:

Recent years, air travel has increased tremendously due to the fact that it is cheaper, safer, and faster than it has ever been. Nevertheless, I believe most of us still recall the most recent aviation crashes like the Ukraine International Airlines crash on January 8, 2020, Ethiopian Airlines crash on March 2019 (killing 157 people onboard), the missing Malaysia Airlines Flight 370 in 2014 that was later considered the largest multinational search and rescue effort made in the Gulf of Thailand, and so on. Some of the events that led to airplane crashes are mechanical issues, pilot's lack of technical skills to operate the plane, and weather condition. There is also some conspiracy of hijacking.

Even though there are concerns about airline safety, travelers are still flying with airlines that have had crashes in the past. Why? Airlines have become an essential transportation method to travel, especially if we are travelling to another continent. Also, there are limited flights to certain destinations that forces travelers to book airlines with crash history no matter what.

In addition, some airlines have improved their service and safety protocol in the course of these years and their rating has significant increased.

Data source:

1. https://github.com/fivethirtyeight/data/blob/master/airline-safety/airline-safety.csv

This is a GitHub repository with several datasets from FiveThirtyEight website. I picked the airline-safety dataset that the author created with data from Aviation Safety Network and FiveThirtyEight website.

2. https://data.world/dataremixed/2018-airline-rankings-by-airhelp

This is my second dataset from the data.world website, but I only used the Airline score column.

Then, I performed some data cleaning for both datasets in Excel, and I joined both in Tableau to create the graphs.

Link to the final datasets https://github.com/H-chen19/Tableau_Airlines_Incidents

About the final datasets:
1. First dataset Columns: Year, Airline, Incidents, Fatal Accidents, Fatalities
2. Second dataset Columns: Rank, Airline, Airline Score

Big Idea:

By joining the two tables, airline-safety and airline-rankings by Airhelp, the visuals are to determine the number of incidents, fatal accidents, and fatalities by airlines between 1985 and 2014 and analyze why the rankings for some airlines are high despite of past incidents. Unfortunately, I was not able to find a more recent dataset.

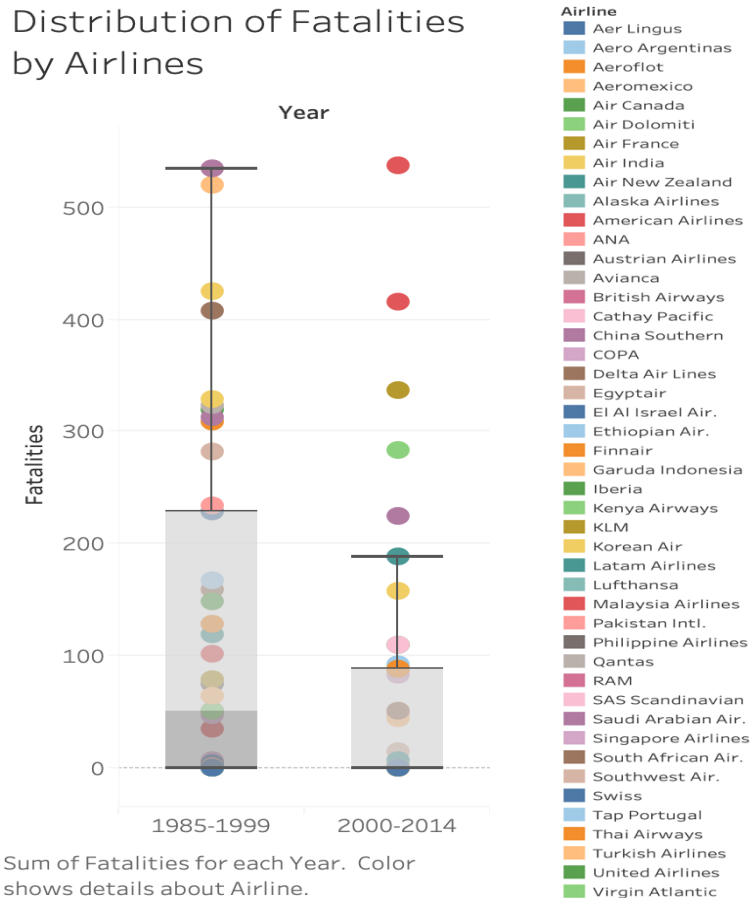*Note: All visuals are done in Tableau.*

1. In this visual, we can see that the majority of the airlines have incidents less than the median. The airlines with the highest incidents are Aeroflot, American Airlines, Delta Airlines, and United Airlines which it is concerning because tree of them we often fly with. Almost 80% of the 46 airlines has more fatalities than the median. Finally, the number of incidents had significantly declined in the year range 2000-2014. It is because of technology and better trained crews, and in this sense, it is believed there is less accidents today than in 2014. (I did not add the median to Fatal Accidents because it is unnecessary for my analysis)

Total Fatalities, Fatal Accidents, Incidents by Year Range
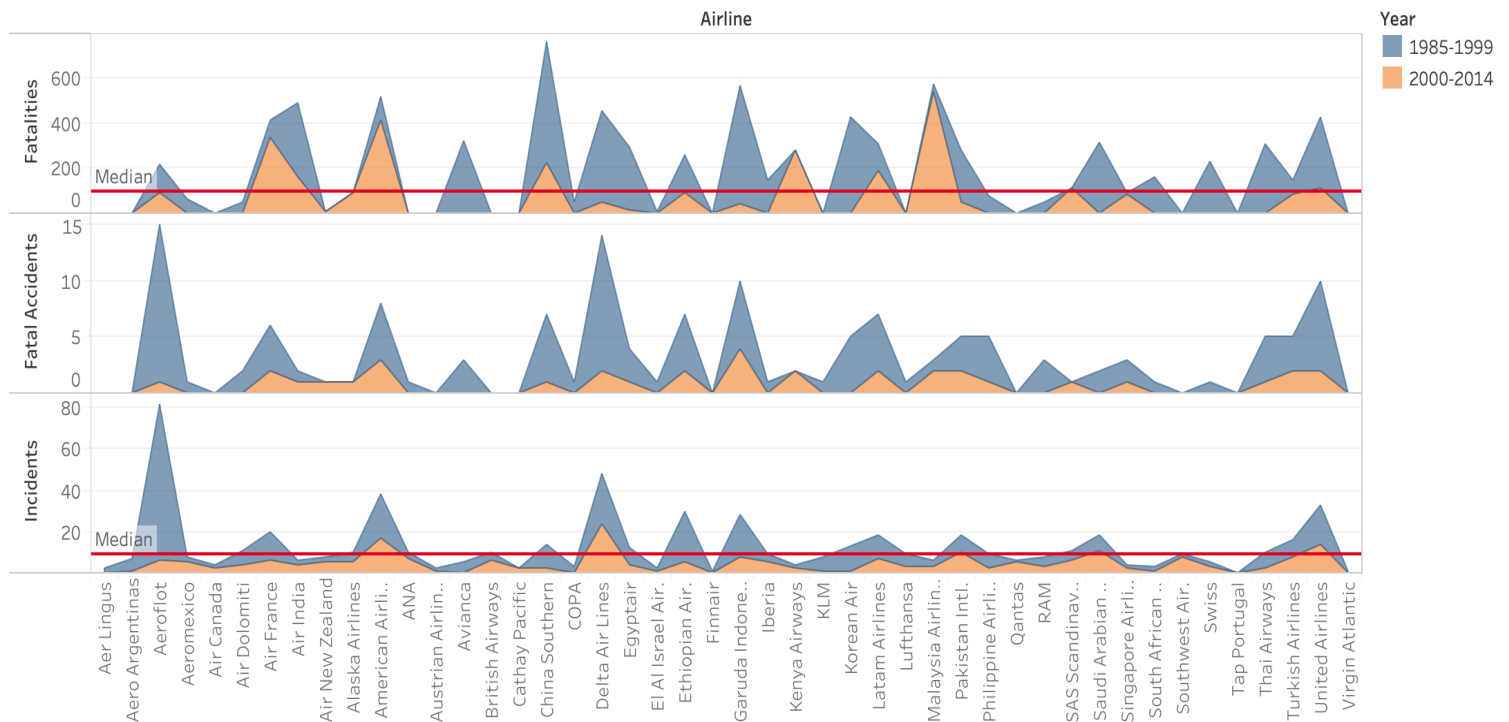
Sum of Fatalities, sum of Fatal Accidents and sum of Incidents for each Airline. Color shows details about Year. The view is filtered on Airline, which keeps 46 of 46 members.

2. This visual is a subset from the previous one. I want to analyze the distribution of fatalities by airlines. For 1985-1999, the airline with the highest number of fatalities is China Southern Airlines (Purple) and followed by Garuda Indonesia (yellow). The one with zero fatality is Aer Lingus for that period. For 2000 – 2014, Malaysia Airlines has the highest number of fatalities mainly because of the missing Malaysia Flight 370 in 2014. The one with zero fatality is Aer Lingus again. Aer Lingus seems to be one of the airlines with good safety protocols.

Distribution of Fatalities by Airlines

Sum of Fatalities for each Year. Color shows details about Airline.

Airline
Aer Lingus
Aero Argentinas
Aeroflot
Aeromexico
Air Canada
Air Dolomiti
Air France
Air India
Air New Zealand
Alaska Airlines
American Airlines
ANA
Austrian Airlines
Avianca
British Airways
Cathay Pacific
China Southern
COPA
Delta Air Lines
Egyptair
El Al Israel Air.
Ethiopian Air.
Finnair
Garuda Indonesia
Iberia
Kenya Airways
KLM
Korean Air
Latam Airlines
Lufthansa
Malaysia Airlines
Pakistan Intl.
Philippine Airlines
Qantas
RAM
SAS Scandinavian
Saudi Arabian Air.
Singapore Airlines
South African Air.
Southwest Air.
Swiss
Tap Portugal
Thai Airways
Turkish Airlines
United Airlines
Virgin Atlantic

3. This visual is about the Airline score based on customer experience and safety. This graph is created using the 2019 scores. I wanted to analyze if the airlines with the most incidents in the past have improved their safety protocols and gain back customers' confidence. Apparently, the ones with the most incidents like Aeroflot, American Airlines, Delta, and China Southern Airlines have scored above 7 which is pretty good compared to others. The airlines with the highest score are All Nippon Airways (ANA) with a score of 8.2, Singapore Airlines with 8.1, and Qantas with 8.04. Without any surprise, these three airlines are the top 3 since they are well known for their services.

Airline Ranking
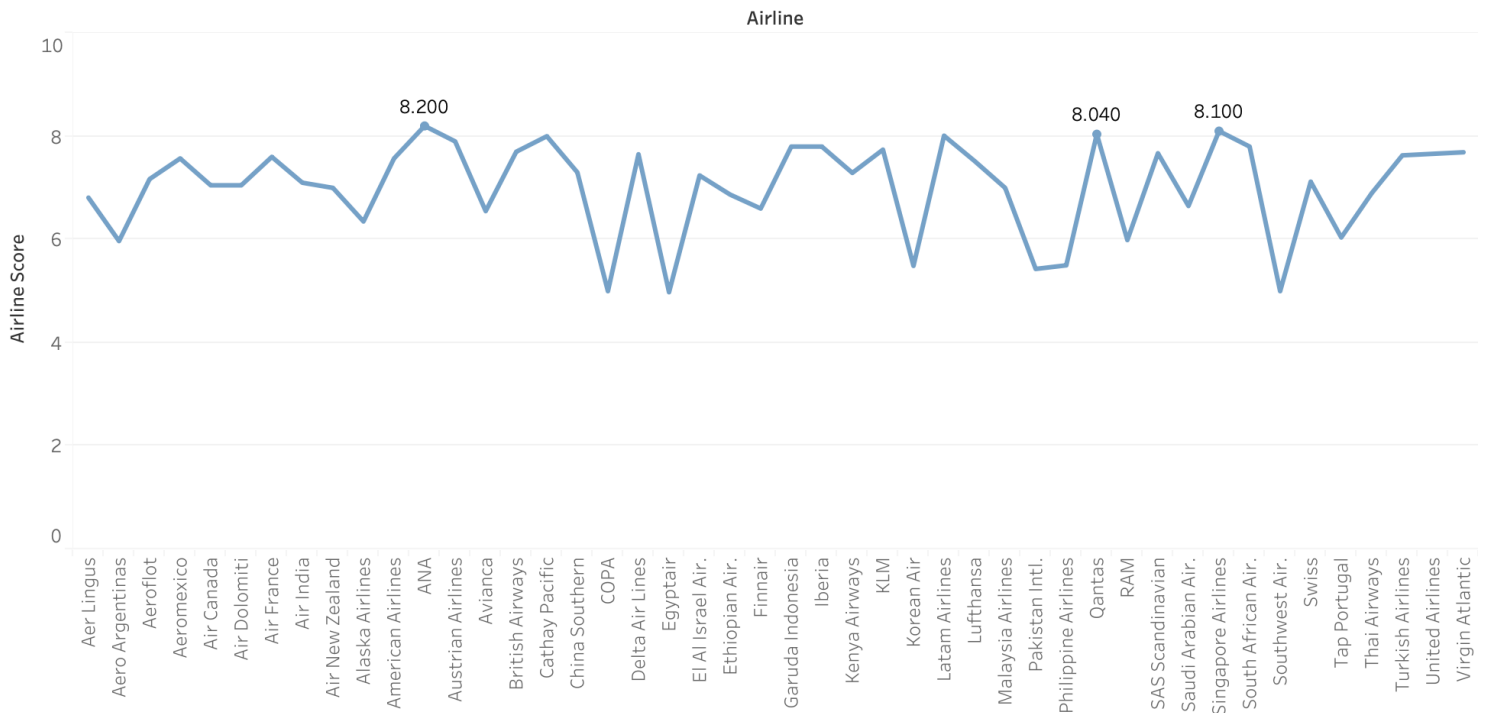
Airline

The trend of maximum of Airline Score for Airline.

4. The visual depicts the airline ranking and the sum of incidents between 1985-2014. The purpose is to analyze if past incidents have affected the airline ranking or if we can see patterns that the airlines have improved their operation and safety. For example, Aeroflot scored above 7 in customer satisfaction in the recent year (see previous graph), and its ranking is around 30 despites of the high number of incidents before 2014. The top 3 in the global ranking is ANA, LATAM airlines, and Qantas which makes sense since ranking is correlated with airline score.

Total Airline Ranking and Incidents between 1985-2014
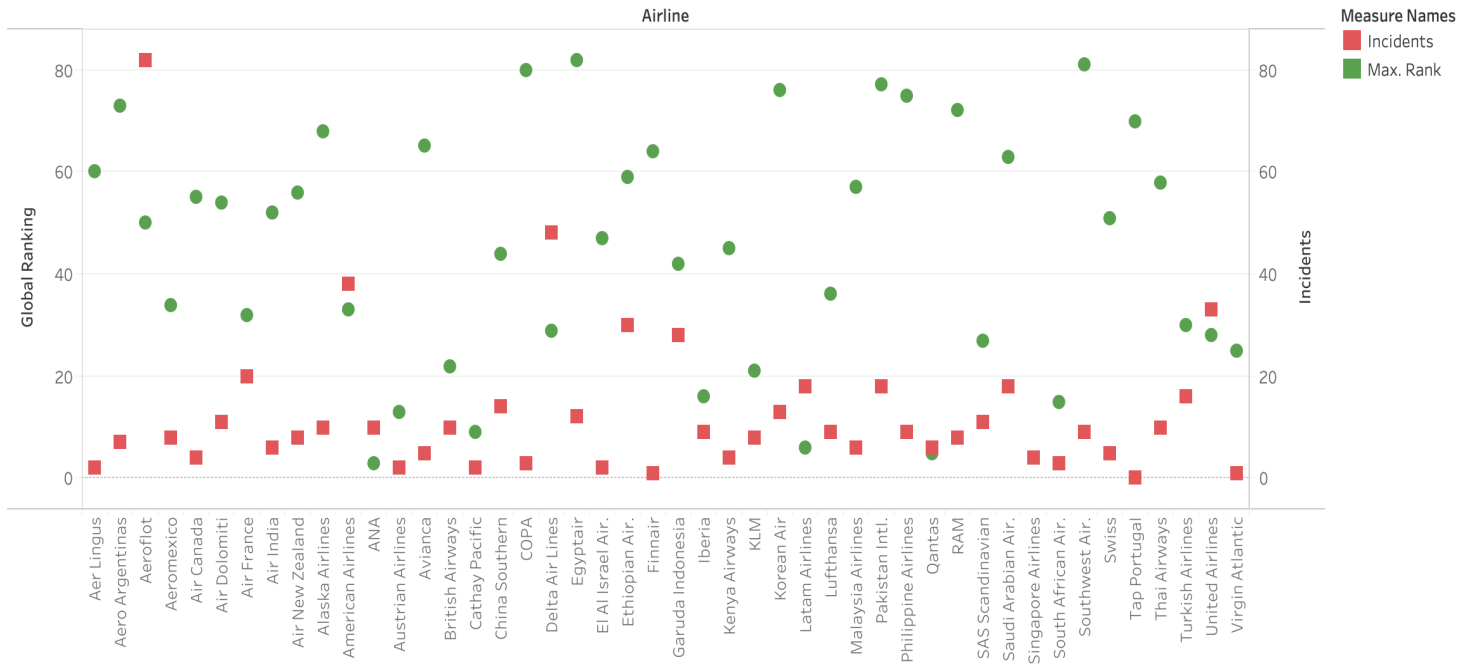
Max. Rank and Incidents for each Airline. Color shows details about Max. Rank and Incidents.