

# DSC640 Week 6

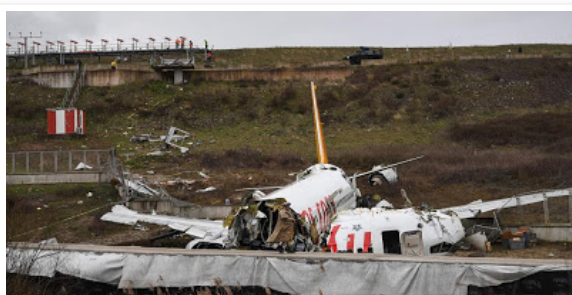
Sunday, July 12, 2020

## Taking Flight - Reviewing the risks of air travel

### Taking Flight

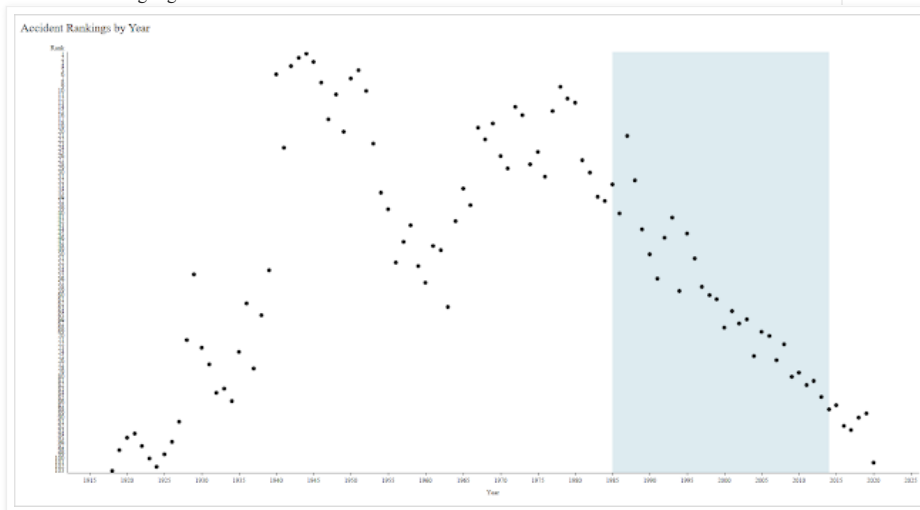
#### A review of the risks of air travel

When it comes to traveling from country to country – or even from state to state in some cases – nothing beats air travel for speed and safety. As the years have passed in the United States since the passing of the Air Commerce Act of 1926, the statement that flight is the safest form of travel has held even as the number of aircraft and the frequency of their voyages have increased. Lately, however, media has presented a picture of air travel that appears much less like the picture above of an Airbus A330 MRTT visiting Geneva and more like this one below from an accident that occurred on February 5th, 2020 in Istanbul.



Media – whether news, social, or anything else – have often suggested that air travel is no longer the safest form of travel, citing experiences such as these. These claims, however, are not presenting all of the data needed to justify those claims by observing data for the 30 years from 1985 to 2014.

The following chart comes from accident rates per year data from the Bureau of Aircraft Accidents Archives (<http://www.baaa-acro.com/statistics/crashes-rate-per-year>), and shows every year from 1918 to the present with its rank by the number of accidents that whole year compared to all of the other years (most number of accidents in a year = rank 1, second most number of accidents = rank 2, etc.). The years of 1985 to 2014 are in the highlighted blue section.



#### Blog Archive

▼ 2020 (1)

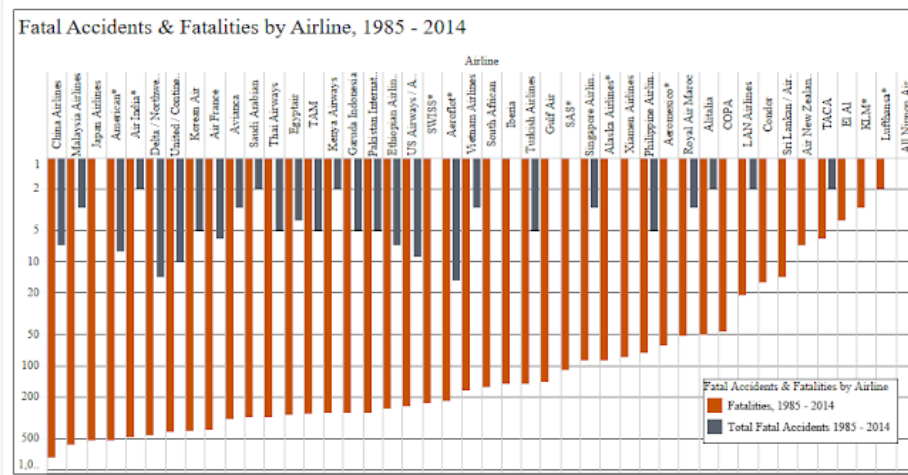
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Taking Flight - Reviewing the risks of air travel

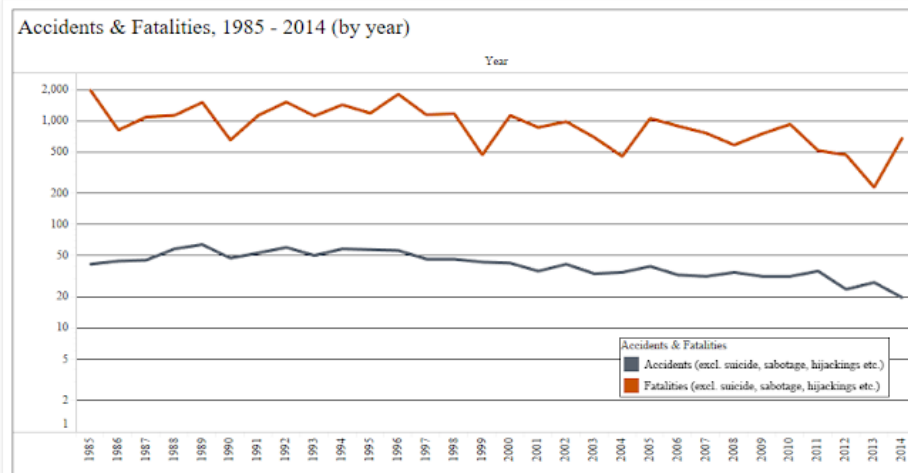


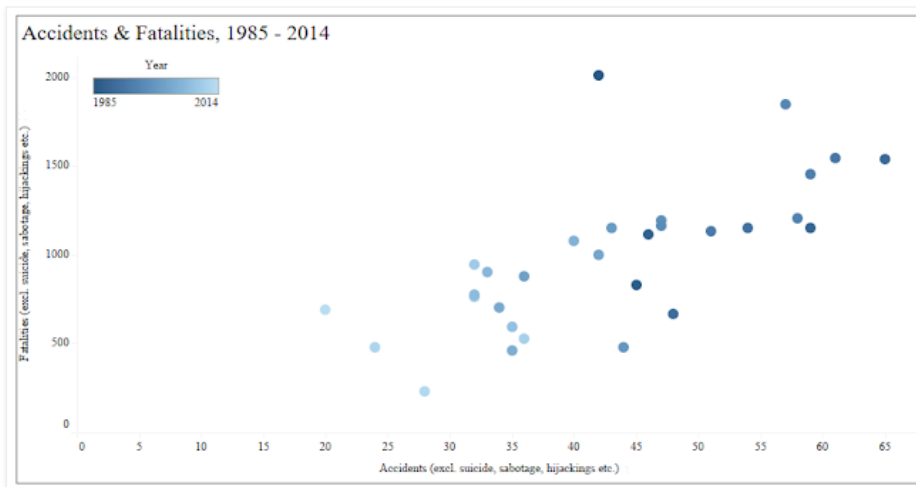
We can clearly see from this chart that during the three decades of review, the trend of the annual accident rates has steadily declined, with 2014 being ranked 88th out of 103 years for the number of accidents, and the trend continues from there. This demonstrates that the risk of accidents is decreasing, which implies safer travel.

But perhaps the number of deaths in each accident has increased – are the accidents that are occurring more deadly now than in the past? First, let's review all of the accidents which have occurred in each airline in our time frame – this data comes from the Aviation Safety Network and can be found here: <https://github.com/fivethirtyeight/data/tree/master/airline-safety>. The following chart shows the total number of accidents and fatalities that have occurred in all airlines between 1985 and 2014, so long as the airline in question has had at least one fatal accident in that time frame. This chart is presented on a logarithmic scale to allow you to see the difference in the large values for fatalities and the small numbers for accidents – any bars that do not appear on the graph have values of 1 due to the limitations of the logarithm function (it cannot show 0).



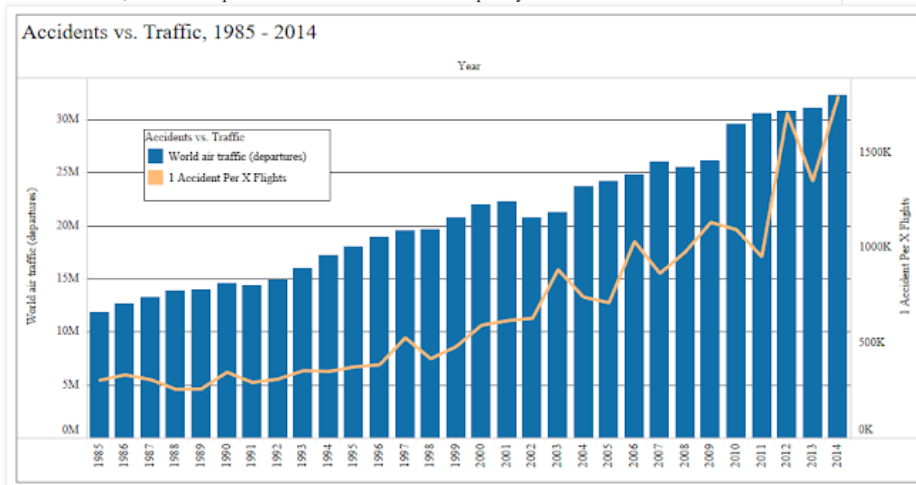
Those airlines with the greater number of accidents and fatalities also happen to be the largest airlines, one with the largest number of aircraft in their fleets. Even then, the number of accidents showing for any one airline is less than 20 during the full 30 years reviewed. These are encouraging figures, since over the course of these 30 years this data shows there were only just over 150 fatal accidents and less than 10,000 fatalities – fewer deaths than the United States experiences in infant mortality each year!





Let's take a look at the combination of these data and see what it shows us. Making use of the data supplied by the Aviation Safety Network database available from [https://docs.google.com/spreadsheets/d/1SDp7p1y6m7N5xD5\\_fpOkYOrJvd68V7iy6etXy2cetb8/edit#gid=661081734](https://docs.google.com/spreadsheets/d/1SDp7p1y6m7N5xD5_fpOkYOrJvd68V7iy6etXy2cetb8/edit#gid=661081734), the upper chart (which also uses a logarithmic scale to more easily compare the two lines without extensive white space) shows the values of each year over the passage of time, while the lower chart graphs the fatalities against the accidents for each year, with the lighter-colored points being later years than the darker-colored ones. These two charts verify what the previous ones already displayed – accidents and fatalities are decreasing over time.

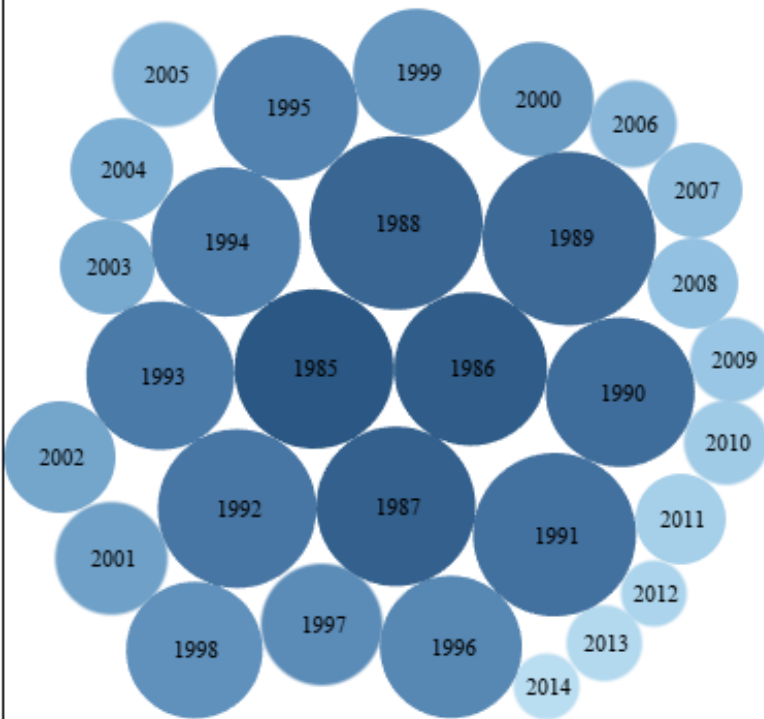
So these straight values show encouraging trends, but perhaps the amount of air travel has decreased – maybe the proportion of accidents is staying the same, or even increasing. Once again using the data from the last two charts, we can compare overall air traffic and the frequency of accidents.



Noting the two different axis scales for the values, we can see that the number of international departures each year have steadily increased, while the number of flights without incident for every one accident has taken an exponential type of growth.

While the previous chart showed the total accidents compared to air traffic (regardless of whether anyone was hurt), this last one shows how many accidents were fatal ones for every million flights made each year. Using the same color scheme as the chart before the previous one (lighter colors are later years), we can easily see the number of fatal accidents in proportion is steadily shrinking – our final confirmation that air travel continues to become safer with each passing year.

## Fatal Accidents per Million Flights, 1985 - 2014



While every fatality is tragic and each accident worrisome, we can confidently say that not only is travel by air the safest form of travel, but also one where the risks are decreasing annually – we can all "take flight" assured that we will arrive at our destination safe and sound!

Posted by AKDavis at 7:00 PM



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