When considering the choice of graphs to display, there were three major questions that we hoped to answer. First, has air travel become more dangerous over time? Next, how does the safety of air travel compare to other modes of transportation? Finally, how have airline revenues trended over time?

Our data came from 5 sources. The bulk of information on airplane fatalities and incidents came from the Aviation Safety Network dataset, although a supplemental entry on all aircraft incidents since 1908 came from a Kaggle.com dataset. Automobile safety information was procured from the NHTSA, while information on air miles and airline revenues came from the Airline Data Project. Finally, information on incidents by plane model came from AirSafe.com.

Data was prepared in R, generally joining these disparate databases into one and performing unit conversions. These output datasets were then loaded into Tableau to create the final dashboard.

Since the safety of passengers was so integral to this study, many of our graphs are directly involved in showing that, overall, air travel has become safer over these years. It was important to put air travel into perspective, and simply comparing the number of fatalities year over year from one method to the other doesn’t give us the entire story. We compared the number of fatalities to hundred million miles transported, which let us compare the relative safety of car travel to air travel. In this case, a line graph with both metrics on it made the most sense. It was important to maintain the same axis for both, so as to not sow confusion. On average, we found that air travel fatalities per hundred million miles were 8.75 times lower than the corresponding value for car travel.

Next, we wanted to compare overall incidents over time. A grouped bar chart was chosen so we could easily compare the number of incidents for 2000-2014 to the 1985-1999 totals, and also the fatal incidents over both time periods. We were able to see that both the number of incidents and the number of fatal incidents both trended downwards. These incidents are becoming less prevalent, and when they do happen, they tend to be less fatal than they were in the past.

We wanted to see whether incidents were limited to a single geographical region, or a specific carrier, which led to the development of the next two metrics. We found that, of the 56 carriers we had information for, 7 of them were responsible for nearly 70% of incidents. A pie chart was selected to show just how much of the incidents were attributed to these high-risk carriers. Only one was a US-based carrier.

Comparing the number of incidents and the number of fatal incidents by geographical region was the next metric we wanted to visualize. It was important to see both, but I didn’t want to graph them on their own scale – I wanted to avoid implying that there were as many fatal incidents as regular ones, so I decided to graph both separately but on the same axis scale. You can compare the top incidents to the bottom fatal incidents. Both Asia and South America hovered around 25% of incidents being fatal, with Africa topping the list at 50%. Of course, the volumes for South America and Africa are much lower. European based carriers had less than 10% of their incidents result in fatalities, which led the pack.

Finally, rounding up our coverage of airline safety, we looked at the number of incidents that involved specific planes. As you can imagine, the Boeing 737 leads the pack. We may want to control for miles flown, if possible, since it could well fall to the Boeing 737 just has more miles in service than any other plane.

Our last graph seeks to answer how airline revenues have been affected. As you can see, since 1995 that trend has been mostly positive. You can see the downturns in 2002 (post 9/11) and 2009 (2009 Recession), but generally within 2 years that downward trend has corrected itself. We’ll see quite a spike here due to COVID-19, but in general the market has recovered.

Put together, these metrics paint the picture that generally air travel has become safer, not more dangerous, over time, especially compared to comparable transportation methods. Not only that, but revenues from flights are increasing steadily as well. It’s clear to see that as it stands, more people are comfortable flying and it remains one of the safest methods of transportation we have.