

The Insiders: Joseph Maurer (joey81@ymail.com), Alex Veroulis (averoulis538@ucla.edu), Stephen Chen (s.chen017@gmail.com), Prateek Mahajan (prateek97@g.ucla.edu), Azeem Banatwala (azeembanatwala@gmail.com)

The development of COVID-19 as a global pandemic has brought the world to a standstill now five months into 2020. As social distancing measures and lockdowns become the norm, the bustling movement of people and economies have grinded to a halt. The specific degree and effectiveness of policies combating coronavirus may vary by region. Our project focuses on analyzing these differences over time via an animated Tableau presentation and statistical tests. We combine daily case/death numbers, google mobility trends, and airline flight data to illuminate the physical actions of populations regardless of government legislation and recommendations.

When looking at flight data, we found a sharp drop in the number of global flights starting in the latter part of March and through April, as expected. However, we were interested in seeing if this precipitous decrease in flight volume would have an impact on the average flight duration. We noticed there was indeed a slight decrease in average flight duration towards the end of March and into April. While the vast majority of days in March had average flight times upwards of 2 hours, there were several days in April that were under the 2 hour average flight time. In addition, there was a significant difference in means between the flight times of March and April according to a t-test. March had an average of 2.077 hours, while April had an average of 2.031 hours, and the resulting p-value was near zero. Lastly, we wanted to see if flight lengths for each month differed largely in certain areas of the world, such as the Americas, Asia/Australia, Eastern Asia, and Europe. Through box plots, we noticed that while the Americas and Eastern Asia had similar averages to the global data, while Asia/Australia and Europe both had much higher flight times in April than the global data. Perhaps this phenomenon can be accounted for in the relatively small number of outgoing flights from these regions in April.

Initially, on 15th February, we see that there are cases only in countries located near China, such as Taiwan, Japan, and Thailand. At this point, there is no change in people's retail activities or recreational park visits around the world. On March 2nd, we see that Italy was the epicenter of the coronavirus. We noticed a decrease in people's average retail activities and recreational park visits in Italy during this time. However, we see no change in retail and recreational activities in other neighboring countries at this point. In the following week, we see that most European countries have now shown a significant reduction in retail and recreational activities. Between March 9th and March 16th, we can see that the United States has now reduced its retail and recreational activities and the average number of cases in the United States went up from around 400 to 4000 cases. During this period, most European countries went into lockdown. For most European countries we observed an approximate 89% decrease in retail and recreational activities. In the latter half of March, we now see that the average cases in the United States have jumped up to around 16000, however, there has not been much decrease in retail and recreational park activities. By the end of April, we can see that the United States retail and recreational activities had still not decreased by much despite a significant increase in the average number of daily coronavirus cases. In addition, after Europe's lockdown, we can see that there has not been a significant increase in the average number of coronavirus cases. Countries where the lockdown was heavily implemented from March to May such as India, Argentina, and Singapore, were able to flatten the curve much faster in comparison to countries where there were no strict lockdown measures such as the United States.

When we see a huge spike in the number of cases in the United States, we can also see that the total number of incoming flights into the United States was still quite large. This could potentially be one of the reasons why we observe a significant increase in the total number of cases in the US from approximately 4000 to 15000. We can also see that other countries such as India and Singapore reduced the total number of incoming flights into the country and this decision led to a small increase in the total number of coronavirus cases for the same week the sharp spike occurred in the United States.

During the week of March 16th, we can see that in the United States there is a steep increase in the number of grocery store and pharmacy visits. This was the 'panic week' that caused people to hoard essential commodities from these stores. Thereafter, once the panic settled, in the following week, we see that grocery store visits in the United States resumed to its normal level.

Data:

https://www.dropbox.com/s/on0o56z5n63uhsa/data_script_datafest.R?dl=0

<https://zenodo.org/record/3782598#.XrYAPRNKhQJ>

https://www.dropbox.com/s/689r3cbvs987qzc/complete_daily_data.csv?dl=0