Global Trends in Entertainment During Heights of the Pandemic: Is Variation in Streaming Service Revenue ($) for Disney+, Netflix, and Hulu Correlated to the Variation in Total World COVID–19 Cases?

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Introduction

This project will be a meta-analysis of how peaks in COVID-19 cases in the entire world are correlated to the increase in quarterly revenue for streaming platforms such as Disney+, Hulu, and Netflix. A meta-analysis is a research process that is used in order to merge the effects of two independent variables. Although there is published data about total COVID-19 cases and quarterly revenue statistics for streaming services, these two forms of data are rarely ever merged.
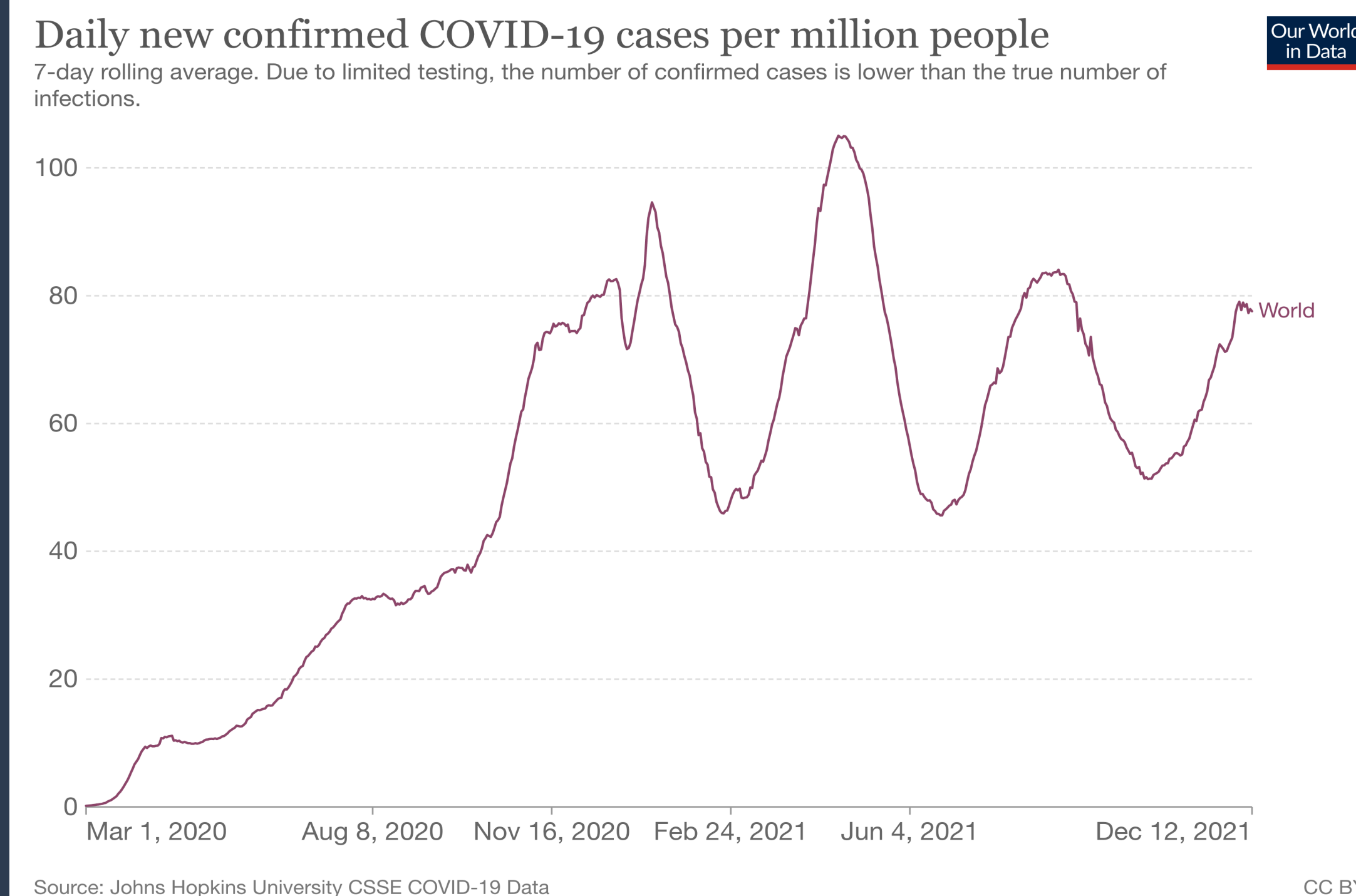
The goal of this project is to demonstrate the human instinct to turn to entertainment at a time of heightened uncertainty and anxiety regarding the pandemic. I aim to visualize the relationship between the increase in COVID-19 cases and quarterly revenue. I aim to model the strong correlation between these two independent variables.

Background

When the world first shut down in March of 2020 due to the increase of COVID-19 cases and lockdowns, there was little to nothing to do aside from binge-watching old and new videos, movies, and/or television shows. This sparked my interest in considering the direct and continuous correlation between an increase in COVID-19 cases and increase in revenue for various streaming services such as Netflix, Disney+, and YouTube.

As I began my research, I noticed that while many academic sources published work describing the positive effect COVID-19 has had on streaming services, there was hardly any work or data connecting the two variables. News outlets, such as USA Today and BBC News, published information defending this correlation with statistics to show that total streaming had increased by 30% since 2019 (BBC News). Some even expressed concerns for streaming platforms as they feared for the decrease in revenue as more citizens got vaccinated and COVID-19 cases decreased. For some streaming services, revenue did decrease between quarters, which is why I am analyzing quarterly revenue in relation to surges and declines in COVID-19 cases. Both COVID-19 cases and streaming service revenue are not continuous variables which is why it serves us well to find a relationship between the two.

Methodology

Daily new confirmed COVID-19 cases per million people
7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.

Source: Johns Hopkins University CSSE COVID-19 Data   CC BY

With the help of this graph created by Our World in Data, one can visibly see that the seven peaks of the pandemic occurred in this order: March 2020, April 2020, August 2020, November 2020, January 2021, April 2021, and August 2021. I am leaving out Q4 2021 data because statistics have not been published regarding quarterly revenue or the total number of COVID-19 cases that are peaking in December 2021 as a result of the new Omicron variant. As each peak occurs in a different quarter, I will acquire the quarterly revenue of Disney+, Hulu, and Netflix and use Tableau to create a bar chart of the data I collect.

The initial lockdowns in March of 2020 are represented in the Q1 2020 dataset. The following peak of Covid-19 cases in April 2020 is represented in Q2 2020. Next, the spike in cases that occurred during August 2020 is portrayed in Q3 2020. Succeeding this, the increase in cases in November 2020 cases are depicted in Q4 2020. Following the increase of cases in January 2021 are illustrated in Q1 2021. After this, peaks during April 2021 are represented in Q2 of 2021. Finally, increasing COVID-19 cases in August 2021 are demonstrated in the Q3 2021 dataset. Pictured below is the data set I used to create my initial graph and analyze the increases and decreases in revenue afterwards.

Results

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Streaming Service Name	Revenue($): Q1 2020	Revenue($): Q2 2020	Revenue($): Q3 2020	Revenue($): Q4 2020	Revenue($): Q1 2021	Revenue($): Q2 2021	Revenue($): Q3 2021
Netflix	5,760,000,000	6,140,000,000	6,430,000,000	6,640,000,000	7,160,000,000	7,340,000,000	7,430,000,000
Disney+	442,000,000	565,000,000	796,000,000	999,000,000	1,110,000,000	1,240,000,000	1,440,000,000
Hulu	4,030,000,000	3,820,000,000	5,030,000,000	6,880,000,000	6,000,000,000	7,000,000,000	7,200,000,000

	Difference in Revenue (Q2 2020-Q1 2020)	Difference in Revenue (Q3 2020-Q2 2020)	Difference in Revenue (Q4 2020-Q3 2020)	Difference in Revenue (Q1 2021-Q4 2020)	Difference in Revenue (Q2- 2021-Q1 2021)	Difference in Revenue (Q3- 2020- Q2 2021)
Netflix	620,000,000	29,000,000	210,000,000	480,000,000	180,000,000	90,000,000
Disney+	123,000,000	231,000,000	203,000,000	11,000,000	130,000,000	200,000,000
Hulu	-210,000,000	1,210,000,000	1,850,000,000	-880,000,000	1,000,000,000	200,000,000
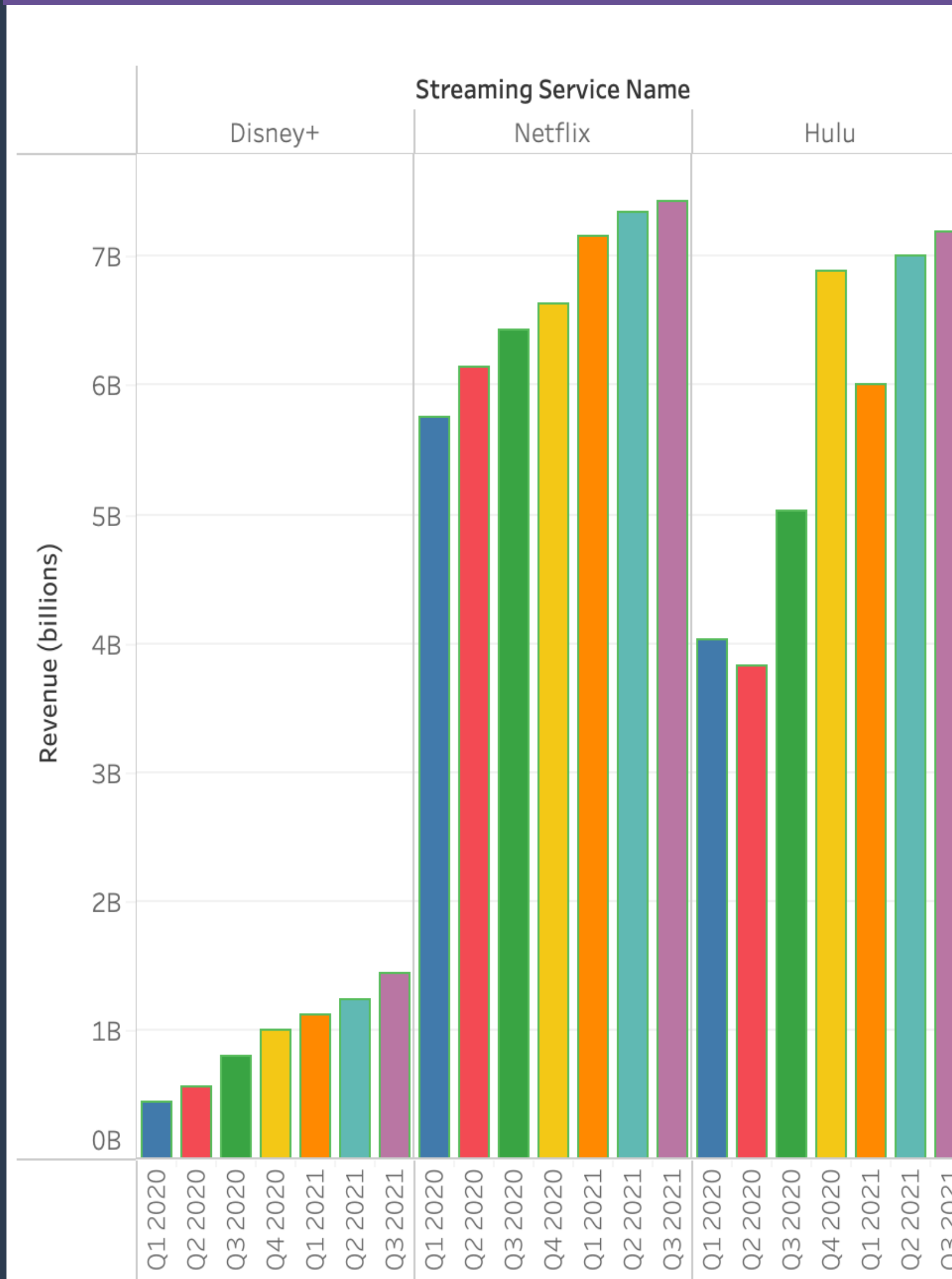
Analysis & Conclusion

My results are not what I expected for this research. If you look at each graph and data set closely, you will notice that Disney+ had the biggest increase in revenue between Q2 2020 and Q3 2020, Hulu's revenue increased the most between Q3 2020 and Q4 2020, and Netflix's revenue grew the most between Q4 2020 and Q1 2021. However, this does make sense considering these three quarters align with some of the highest COVID-19 cases recorded for the entire world.

Furthermore, Hulu was the only streaming service that saw both increases and decreases in their quarterly revenue. This does not surprise me since COVID-19 cases vary, and governments fluctuated with their stay-at-home orders. Therefore, variation in the data is expected because of the surge in COVID-19 cases during the holiday and summer seasons, and due to the more contagious spread of the Delta Variant. In turn, this led people to remain cautious and question stepping in and out of social settings. Therefore, peaks of the pandemic allowed people to stream based on their discretion of the of what was safe versus unsafe to do. However, it would be interesting to go beyond this research and examine why Disney+ and Netflix's revenue exponentially increased across the span of almost two years. The distribution for both the Disney+ and Netflix data is skewed left, while the distribution for Hulu data can also be considered skewed left with the single outlier for decrease in revenue during Q1 of 2021.

Although there was no quarter that demonstrated the largest increase in revenue amongst all three streaming platforms, each platform's highest revenue increase occurs during at least one peak of the pandemic. Therefore, the data from Our World in Data and the data and bar graphs that I created with statistics published by the Business of Apps proves my hypothesis that increase in revenue for streaming platforms are correlated to increases in total COVID-19 cases in the world.

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Acknowledgements