MIS 505

Final Project Report

Grace Williams

Exploration of Covid-19 Related Deaths in the United States

From 2020 to 2022

COVID-19 impacted everyone on the planet in some form, directly or indirectly. 2020 was the first year COVID-19 became recognized as a threat to the United States. The purpose of this analysis is to examine CDC cause of death data and compare COVID to the top 3 causes of death in the United States. I hypothesize that we will see the effectiveness of the vaccines and lockdowns in the form of a decrease in COVID deaths. I also examine the time of year, school start times and holidays.

There are several categories of cause of death:

-Accidents (Unintentional) – traumatic injuries resulting from falls, etc.

-Alzheimer Disease

-Assault (Homicide)

-Cerebrovascular Diseases – Strokes, aneurysms, carotid stenosis, etc.

-Chronic Lower Respiratory Diseases – Chronic Obstructive Pulmonary Disease (COPD), chronic bronchitis, asthma, etc.

-COVID-19 (Multiple Causes of Death) – death that cannot be classed as just being caused by COVID, there were other illness/injuries that contributed

-COVID-19 (Underlying Cause of Death) – death caused directly by COVID

-Diabetes Mellitus

-Diseases of the Heart – heart attack, heart failure, high blood pressure, arrhythmia, etc.

-Drug Overdose – all types of drug overdose, not just narcotic/opiates

-Influenza and Pneumonia

-Intentional Self-Harm (Suicide)

-Malignant Neoplasms – any death caused by any type of cancer

-Motor Vehicle Accidents

-Nephritis, Nephrotic Syndrome, Nephrosis – kidney disease/disorder

-Other Diseases of the Respiratory System

-Septicemia

- Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified

COVID is broken down into two categories, underlying cause, or multiple cause of death. The distinction is important as we want to examine deaths caused directly by COVID. If a patient had COVID but also had other comorbidities that obscured cause of death it would be classified as COVID (multiple cause of death). I am focusing on deaths directly caused by COVID in this analysis.

To begin, I decided to give a quick overview of COVID from 2020 to 2022. Since the primary symptoms of COVID are respiratory I decided to compare the COVID deaths to other respiratory deaths. Since 2020 was the start of COVID I wanted to focus on that year specifically.

The month with the most COVID deaths was December 2020. This makes sense as people travel the most for the holidays towards the end of the year and spread/caught COVID. We also must consider that COVID wasn’t fully recognized as being so deadly at first. Due to this, the beginning of the year doesn’t have as many reported deaths attributed to COVID.

Looking at the difference of deaths from month to month and comparing it to the running total gives insight into whether lockdowns were effective. Lockdowns began late March to late April, but it took time to put in place so the lag between increasing numbers in April to the decrease in May can be explained. We also see a spike in July when different states started to “reopen” after the decrease (or flattening of the curve) in June. October to December we see another large increase in deaths, one explanation is people travel more frequently for holidays. Another explanation is that COVID mutated and became more deadly for older age groups (see footnote).

From there we move on to a series of line graphs. The first is total COVID deaths from 2020 to the end of 2022. I wanted to see if the vaccines are effectively decreasing COVID mortalities. Interestingly, deaths decreased from when vaccines started being implemented (January 2021) but spiked from August 2021 to February 2022. Schools in the US typically start around August and new variants were occurring around the same time as well. Vaccines were still being developed and boosters became available around January 2022-March 2022. The trend of COVID deaths is decreasing which indicates treatments and vaccines are effective.

The next three graphs are comparing COVID deaths to the top three causes of death in the US, heart diseases, cancers, and accidental injury (see footnote). I decided to focus on 2020 again due to it being the first year COVID was recognized as primary cause of death. Since it wasn’t recognized right away, we see heart disease deaths still exceeded COVID deaths. Heart disease deaths remained relatively stable while COVID deaths bounced up and down but finally ended significantly higher. The cancer and COVID comparison is very similar to the heart disease, COVID bounced around and eventually surpassed the relatively stable cancer.

I was most surprised by the third graph. The third highest cause of death in the US is accidents (unintentional). I didn’t think COVID would affect those numbers as unintentional accidents are chance events. But I thought that COVID would have to have changed assault numbers. High stress of the pandemic and lockdowns, loss of jobs, the world basically being up ended, had to have affected assaults. It was surprising that assaults (homicides) remained relatively flat. There was no significant change in either trend as they compared to COVID.

To finish, I compared all the causes of death to COVID (both categories). I decided to include this table to give a larger perspective. It includes all causes of death for each year from 2020 to 2022.

Everyone was affected by COVID-19. I was a paramedic during 2020 and experienced the effects first-hand, professionally and personally. As morbid as this analysis is it is important to recognize trends and why they may have happened. It gives insight for the next national (and global) disaster.