The Heart Disease Pandemic and its correlation to Convenience Restaurant Density

**Introduction**

In the United States in 2020 375,000 people died of COVID19 complications. Some will say that our government has not done enough to fight the disease, and some who will say that our government has been too overreaching in its fight against COVID19. From my perspective, I believe our collective reaction to fighting COVID19 has been astounding and when called to limit our mobility and protect our neighbors we responded. Often, we did not agree with what was required of us but we followed guidance, and although we have not overcome COVID19, in July 2021 the US is in a much better place, relative to COVID19, then we were a year ago.

In the United States in 2020 690,000 people died of heart disease. Between 2010 and 2019 6.2 million people in the United States died of heart disease. That is over 1.5 times the number of COVID19 deaths in 2020 on average for the past 10 years. The number of people dying from heart disease is staggering, and as most of us emerge from the only pandemic of our lifetime, I encourage us to consider that we have been living in a heart disease pandemic or a cancer pandemic for the past century and simply have not defined it that way.

Between 2000 and 2012, the death rate from heart disease decreased 24%. However, since 2012, the rate of heart disease deaths has increased 5%. Large metropolitan areas fared better with an increase of 1%, while the rest of the US has seen an increase of 7%.

While there are likely many reasons for an increase in heart disease, this analysis explores the concept of convenience restaurants and their potential correlation to heart disease deaths. Healthy eating is a message that we have understood for some time. Often it is more convenient to stop for a meal, then to cook healthy at home. This Analysis explores the correlation between the density of convenience restaurants and the death rate from heart disease.

**Data Sources**

In order to support the final correlation analysis, access to the Center for Disease Control and Prevention cause of death databased, Wonder, was obtained and queried for deaths related to heart disease. This data was evaluated for the time period 2010 to 2019 and was aggregated for stability in areas with relatively small populations. The CDC provides this information at the county FIPS level in order to understand how death rates are distributed in the United States.

The count of convenience restaurants was obtained by passing the county centroid latitude and longitude coordinates to the Foursquare API to search specific venue categories. This was completed for each county centroid in the United States and compiled in a Pandas dataframe. County centroid latitude and longitude coordinates were obtained from a Wikipedia page titled “Table of United States counties” The python package Beautiful Soup was used to parse the Wikipedia table and create a dataframe from which to pass Foursquare the required coordinates. The approach loops through Foursquare to obtain a list of venues that are within 20 miles of each county centroid. This dataframe was then used to create a count of convenience restaurants in each county. That count is referred to as the convenience food density for each county.

To better familiarize the audience with the concept of convenience food restaurant venues I have provided a sample of top 10 categories and venues. Most will gain a greater understanding of the analysis by reviewing the following lists.

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| --- | --- | --- | --- | --- |
| Top 10 Venue Categories | |  | Top 10 Venues | |
| Venue Category | Count |  | Venue Name | Count |
| FAST FOOD RESTAURANT | 65,293 |  | SUBWAY | 16,966 |
| PIZZA PLACE | 49,115 |  | MCDONALD'S | 6,533 |
| BURGER JOINT | 12,699 |  | TACO BELL | 4,434 |
| DINER | 12,318 |  | DAIRY QUEEN | 4,372 |
| FRIED CHICKEN JOINT | 8,827 |  | PIZZA HUT | 4,260 |
| DONUT SHOP | 7,234 |  | BURGER KING | 3,664 |
| FOOD TRUCK | 2,673 |  | DOMINO'S PIZZA | 3,660 |
| BAGEL SHOP | 2,174 |  | DUNKIN' | 3,642 |
| FOOD COURT | 1,776 |  | WENDY’S | 3,349 |
| HOT DOG JOINT | 1,664 |  | ARBY'S | 3,122 |

These lists contain many of my favorite food choices, providing even more reason to explore the relationship between these kinds of restaurants and heart disease.

Once heard disease death data is obtained and cleaned it will be joined to the convenience food density data so that comparisons can be made at the county level.