Patrick Burke

Econ 372

Final Project

5/2/2022

Section 1: Description of the Selected Markets and Hospitals

I selected Queens (FIPS 36081) and The Bronx (FIPS 36005) as my markets for this project. I'm very familiar with these areas, as I grew up in Queens and went to High School in The Bronx. To clear up some possible confusion, on the Econ 372 Hospital Markets form, FIPS 36081 (Queens) is listed as "Jamaica". However, I verified that it does indeed contain all the hospitals in the borough of Queens. This was caused by Queens having a very strange convention for what is used in the "city" field of an address. For the rest of the boroughs that make up NYC, you simply put your borough in the "city" field (except Manhattan, where you put "New York"). For Queens, you put your neighborhood, which is much less well defined and always causes confusion.

Of the original hospital list that I selected, several turned out to be specialty hospitals and thus were not usable. I found a list of all the NYC zip codes sorted by the borough on GitHub[i] and used this to filter the Medicare Provider Utilization and Payment Data[ii] to find all the hospitals present in the dataset located in Queens and The Bronx. There turned out to be 6 for each market, making 12 in total. One hospital from each market was found to be non-compliant, thus giving me a full dataset of 10 compliant hospitals.

Of these 10 hospitals, 5 of them fall under the NYC Health + Hospitals. For Queens, this includes Queens Hospital and Elmhurst. For the Bronx, this includes Jacobi, Lincoln, and North Central Bronx Hospital. Thus, there is some overlap in terms of the same system appearing in

both markets. The other system that contains multiple hospitals I analyzed is MediSys Health Network, which comprises Jamaica Hospital and Flushing Hospital. The remaining three hospitals are either independent or have related hospitals in other markets.

Section 2: Hospital Prices, Charges, and Medicare Payments:

I collected the data for Medicare payments and the gross charges directly from the Medicare Provider Utilization and Payment Dataset. On this dataset, Medicare Payment is listed as "Average Total Payment Amount" and Gross Charge is listed as "Average Submitted Cover Charge".

The DRG codes I chose were: 291 (Heart Failure and Shock with Major Complication or Comorbidity), 312 (Syncope and Collapse), 392 (Esophagitis, Gastroenteritis, and Miscellaneous Digestive Disorders without Major Complications or Comorbidities), 690 (Kidney and Urinary Tract Infections without Major Complications or Comorbidities), and 871 (Septicemia or Severe Sepsis without Mechanical Ventilation 96+ hours with Major Complications or Comorbidity). These were among the most common codes across all the hospitals, and I thought that they were an interesting mix.

Some of the hospitals made it much easier than others to gather the negotiated payment data, which I will address in section 4. I computed the number for "negotiated payment" by averaging across four insurance companies: 1199 National Benefit Fund, Aetna, EmblemHealth (formerly known as GHI), and United Healthcare. I used the general commercial plan for each of these. After testing a number of combinations of insurance plans, these four plans stuck out as the most consistent across the available data. 1199 initially appeared to be some sort of public insurance plan, but after doing some research it is insurance provided by a healthcare workers

union. Therefore, it should be comparable to the rest of the plans, which usually are provided to employees by their employer. I also made sure to include EmblemHealth/GHI as this is the health insurance that I have. I get access to this insurance as a dependent of my mom, who is a public-school teacher in The Bronx.

The full combined dataset that I created (FinalCombinedDataset.csv) can be found attached to my submission. Figure 1 below displays a summary of the hospital payments, averaged across all the DRG codes I selected. Figures 2 and 3 display the range of charges, negotiated prices, and Medicare payments across hospitals in The Bronx and Queens, respectively.

Market	Hospital Name	Average Gross Charge	Average Medicare Payment	Average Negotiated Payment
Bronx	Bronx-Lebanon Hospital Center (BronxCare)	$19,259.77	$20,270.73	$13,599.89
	Jacobi Medical Center	$35,817.33	$20,772.72	$12,547.12
	Lincoln Medical & Mental Health Center	$22,775.71	$21,876.50	$15,642.74
	Montefiore Medical Center	$81,861.62	$15,643.27	$50,727.16
	North Central Bronx Hospital	$32,149.21	$17,701.27	$16,181.62
Queens	Elmhurst Hospital Center	$51,814.56	$21,418.36	$17,478.26
	Flushing Hospital Medical Center	$20,119.76	$13,459.55	$15,467.10
	Jamaica Hospital Medical Center	$21,513.04	$14,330.85	$16,699.90
	New York-Presbyterian/Queens	$48,596.70	$11,989.92	$22,394.73
	Queens Hospital Center	$45,719.40	$20,819.21	$14,746.03

Figure 1 – Average Payments by Hospital

The thing that immediately strikes me about the data in Figure 1 is the fact that for Bronx-Lebanon, the average Medicare payment ($20,270.73) is higher than the average gross charge ($19,259.77). At first, I thought that I had to have made an error in computing the data, but both of those figures are a simple average taken straight from the Medicare Provider Utilization and Payment Data. This does not seem to make sense. I went back and looked at the data and filtered for only Bronx-Lebanon. There is only data for 56 DRG codes available. I took the mean Medicare payment and gross charge across the 56 codes, and the average Medicare payment is actually higher than the gross charge, at $25,377.22 compared to $22,758.10. I'm not sure why this would be the case. As seen in figure 1, Bronx-Lebanon has the lowest average gross charge amongst all the hospitals that I analyzed. It's possible that they have low bargaining power which causes them to set low gross charges.

In contrast, Montefiore has the highest average gross charge by far ($81,861.62), which is over double the next highest in the Bronx. In section 3, I will address how this relates to competition.

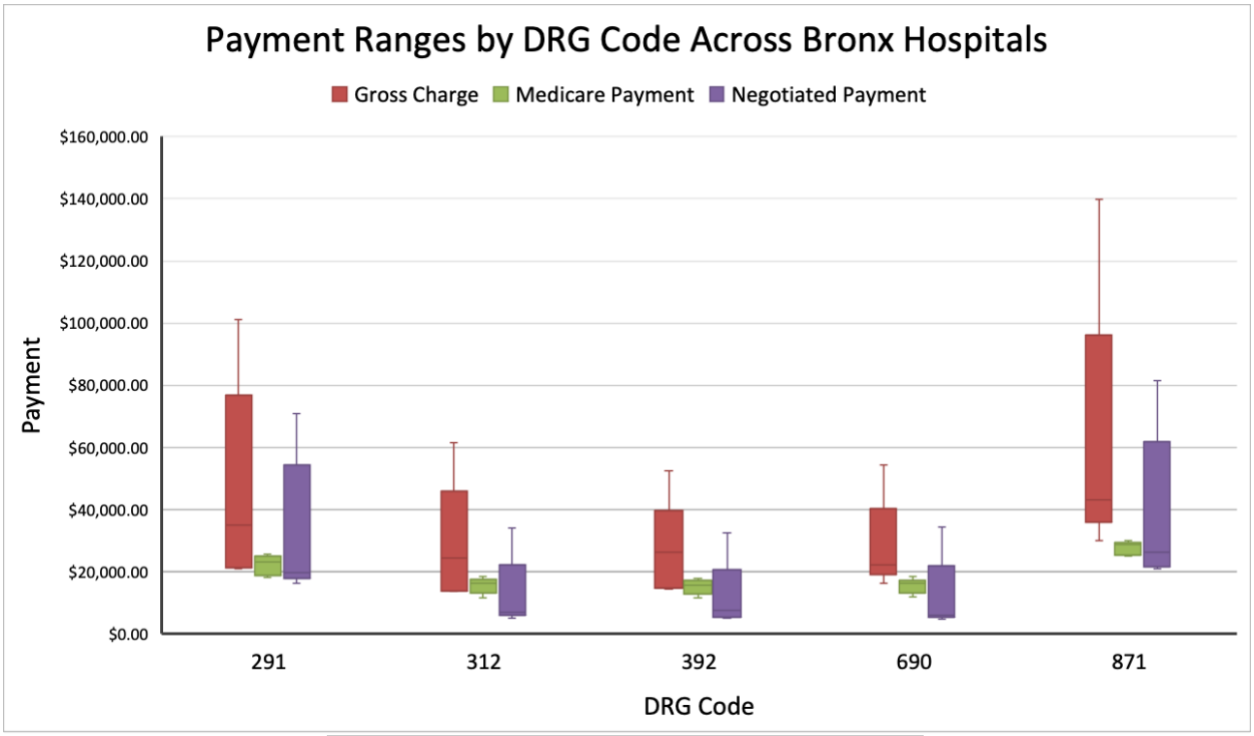

Figure 2 – The range of charges, negotiated prices, and Medicare payments across hospitals in The Bronx

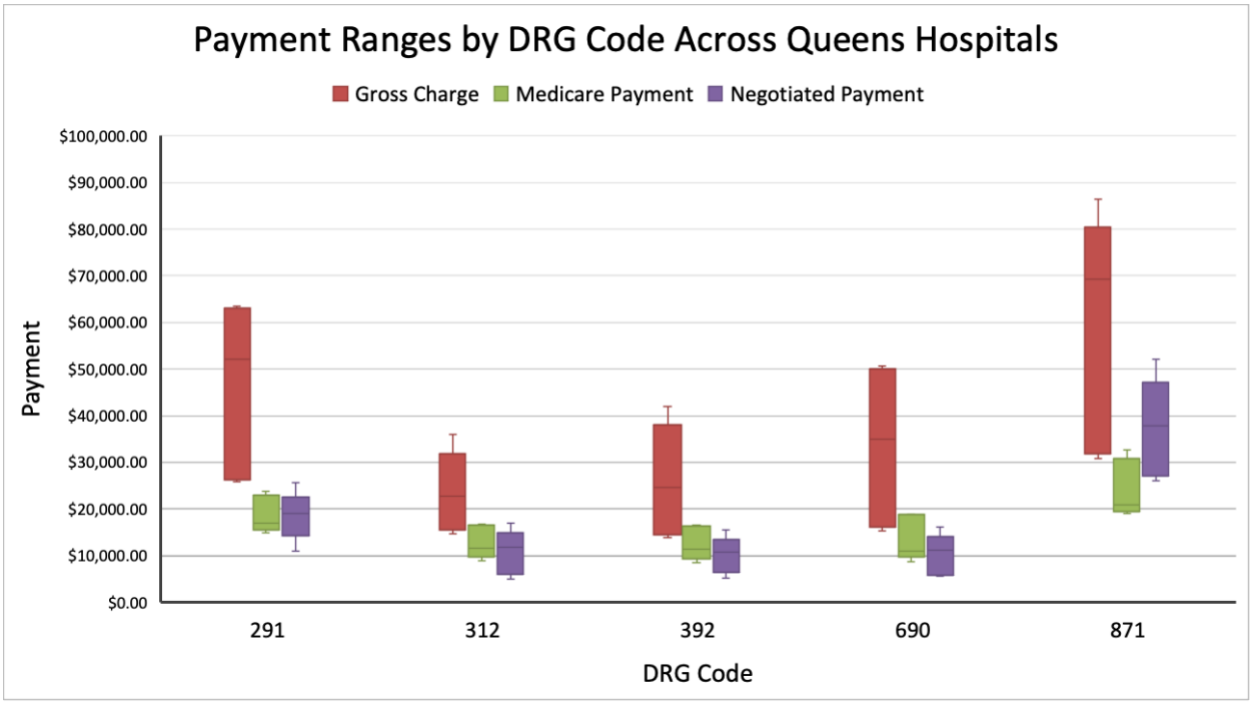

Figure 3 – The range of charges, negotiated prices, and Medicare payments across hospitals in Queens

Figures 2 and 3 show that in both markets DRG code 871 leads in all the various price categories. This seems logical, as sepsis with major complications seems like a condition that would require expensive medications as well as a long duration in the hospital.

Section 3: Pricing and Competition:

Market	Hospital Name	Total Discharges	Market Share	Negotiated Payment (DRG 291)
Bronx	Bronx-Lebanon Hospital Center	1412	8.36%	$19,119.25
	Jacobi Medical Center	1359	8.05%	$17,708.00
	Lincoln Medical & Mental Health Center	900	5.33%	$19,632.40
	Montefiore Medical Center	13100	77.56%	$25,639.31
	North Central Bronx Hospital	119	0.70%	$10,864.96
	Total	**16890**	**100.00%**	**$92,963.93**
Queens	Elmhurst Hospital Center	1163	10.03%	$37,764.48
	Flushing Hospital Medical Center	1704	14.69%	$19,917.55
	Jamaica Hospital Medical Center	1353	11.67%	$16,273.80
	New York-Presbyterian/Queens	6584	56.77%	$70,945.69
	Queens Hospital Center	793	6.84%	$19,774.65
	Total	**11597**	**100.00%**	**$164,676.17**

Figure 4 – The market shares of each hospital defined as a percentage of total discharges, and their respective negotiated payments for DRG 291.

Figure 4 shows that we have two clear outliers in the data. In the Bronx, Montefiore is larger than all of the other hospitals combined. I was not aware of this prior to this project. I went back and looked at the hospital in The Bronx that I didn't include, St. Barnabas, to see if they may have changed this startling number. St. Barnabas only has a total of 674 discharges, thus they are the second smallest hospital in the Bronx and would not have had much of an effect.

NY Presbytarian also makes up more than half of Queens. St. John's, the Queens hospital that I omitted from my analysis, had a total of 1,564 discharges. This would have dropped NYP below 50%. Figure 4 shows that for DRG 291, NYP the highest negotiated payment by far. In reality, this is an outlier, if we look back at Figure 1, their average negotiated payment comes in second place to Montefiore, and it isn't close ($22,394.73 vs. $50,727.16)

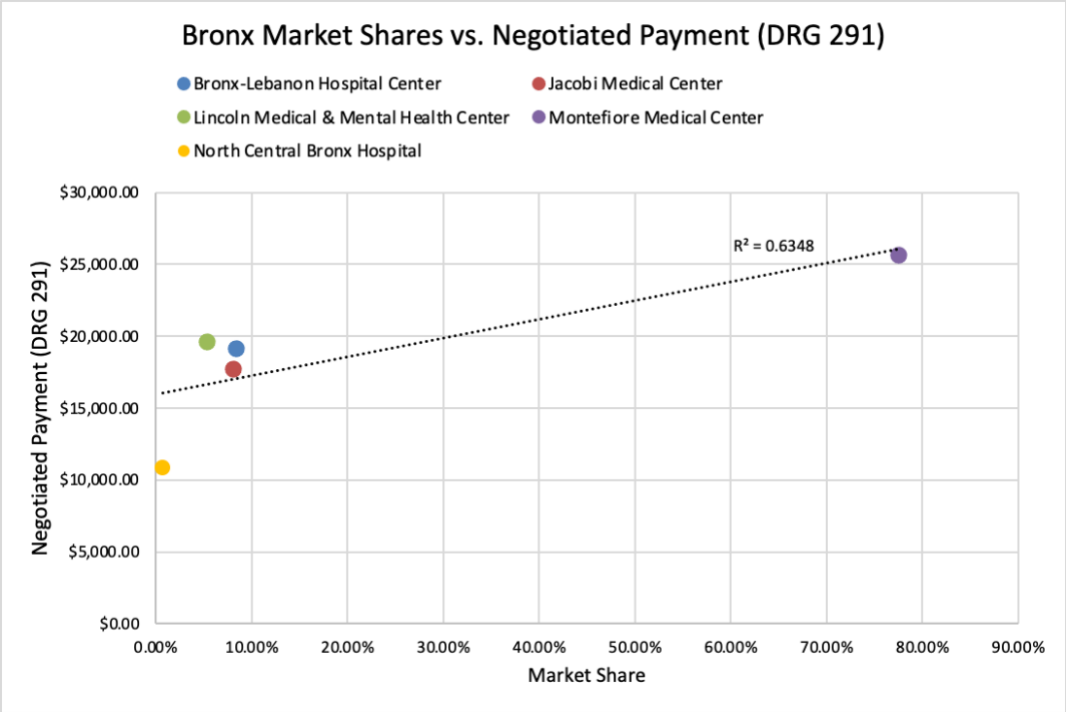

Figure 5 – Market shares of Hospitals in The Bronx in comparison to their respective negotiated payments for DRG 291.

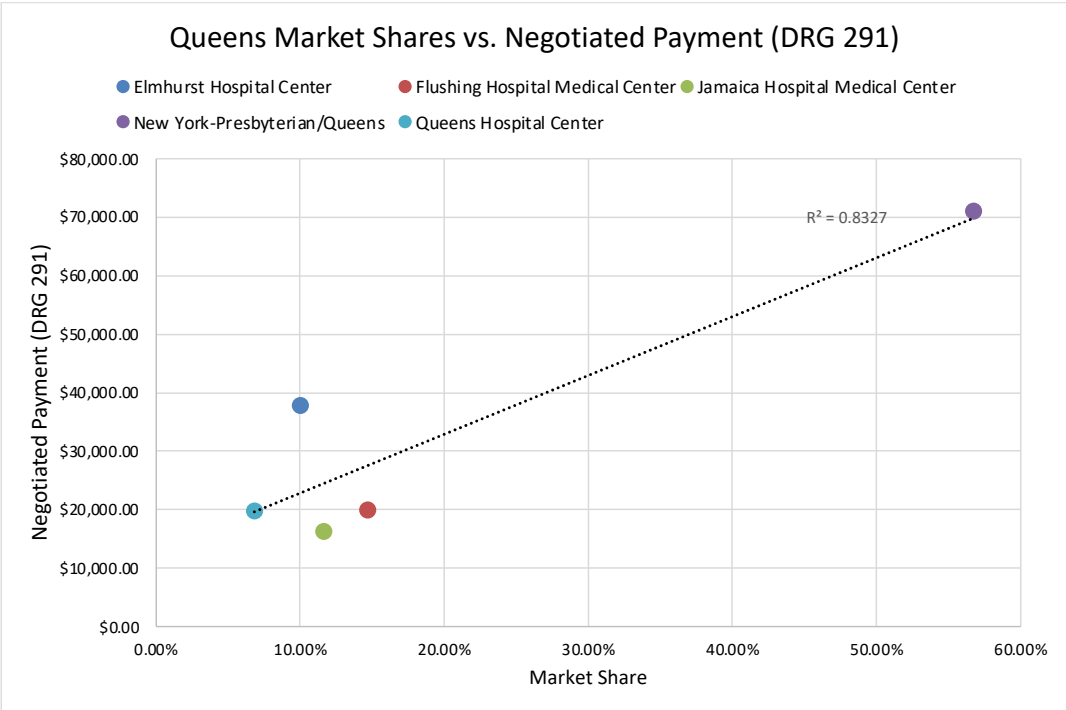

Figure 6 – Market shares of Hospitals in The Bronx in comparison to their respective negotiated payments for DRG 291.

With the outliers, there is a clear positive relationship between market share and negotiated payment. However, this relationship falls apart if the outliers are removed. Still, this shows that empirically, having a majority market share increases the bargaining power of these giant hospitals and allows them to get the highest amount of money from the insurance companies.

This also provides some explanation for the results found in section 2, where Montefiore was founded to have largest gross charge by far in The Bronx, over double the next highest in its market. Given their massive market share, they can set extremely high gross charges and the use their bargaining power to negotiate a favorable negotiated payment. To put Montefiore's dominance in perspective, I combined the markets and included the hospitals that I previously omitted.

Hospital Name	Total Discharges	Market Share	Average Negotiated Payment
Montefiore Medical Center	13100	42.64%	$50,727.16
New York-Presbyterian/Queens	6584	21.43%	$22,394.73
Flushing Hospital Medical Center	1704	5.55%	$15,467.10
St. John's	1564	5.09%	?
Bronx-Lebanon Hospital Center	1412	4.60%	$13,599.89
Jacobi Medical Center	1359	4.42%	$12,547.12
Jamaica Hospital Medical Center	1353	4.40%	$16,699.90
Elmhurst Hospital Center	1163	3.79%	$17,478.26
Lincoln Medical & Mental Health Center	900	2.93%	$15,642.74
Queens Hospital Center	793	2.58%	$14,746.03
St. Barnabas	674	2.19%	?
North Central Bronx Hospital	119	0.39%	$16,181.62
Total	**30725**	**100.00%**	

Figure 7 – Market shares of all hospitals in both markets with average negotiated payments

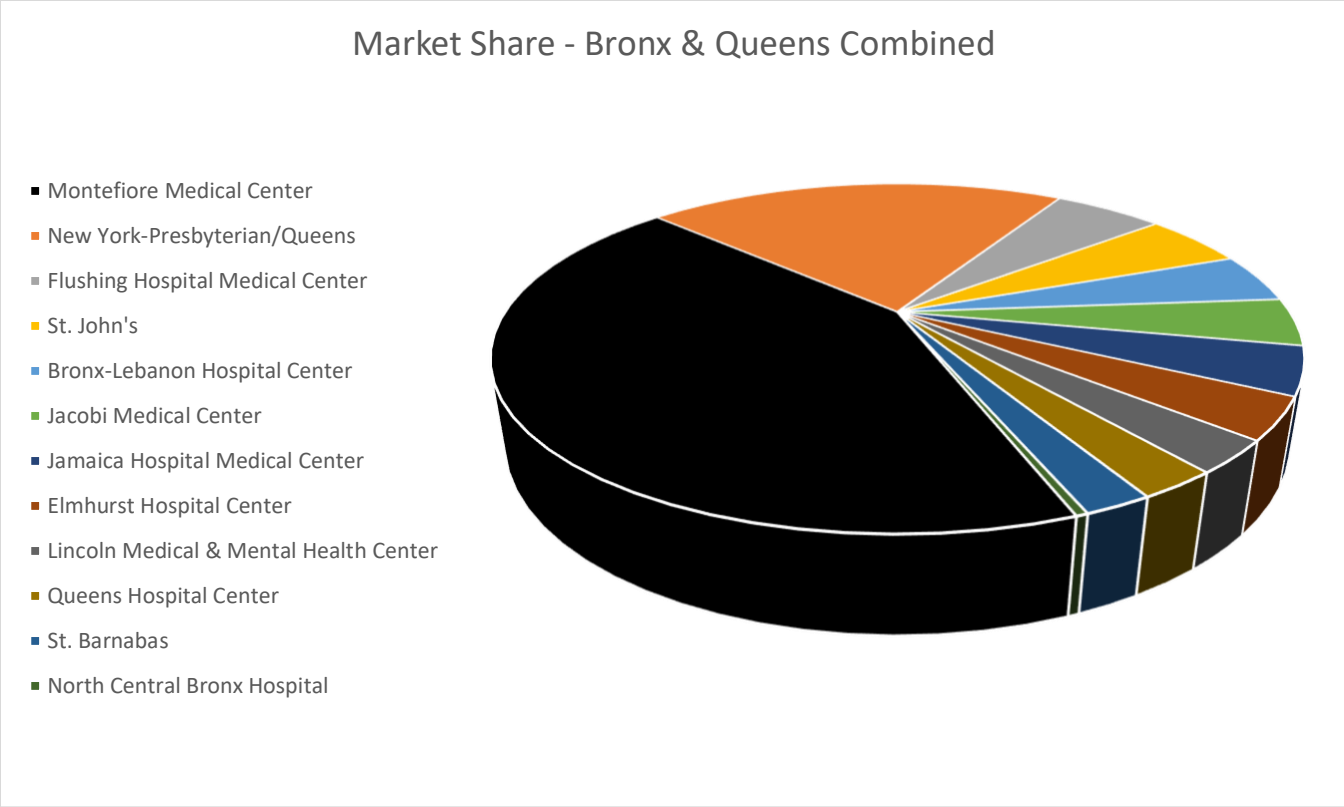

Figure 8 – Market shares of all hospitals in both markets.

Figures 7 and 8 illustrate how large Montefiore and New York Presbyterian Queens are, and why they are able to get such high negotiated payments.

Section 4: Compliance and Competition

I was able to find 10 "compliant" hospitals, although some of these hospitals were certainly more compliant than others. The data that Montefiore provided was by far the worst. It comes in a completely unreadable json file that cannot be converted to excel or to a .csv using any of the converters that I tried. With the help of a friend, I was able to use python to manually manipulate the data into readable format. It was not easy and required computer science knowledge beyond my scope. Thus, they really should be non-compliant as the large majority of

interested parties would not be able to view any of that data. Interestingly, Montefiore also has the largest market share by far out of the hospitals I analyzed, making up a whopping 77.56% of The Bronx.

This trend does not carry over to Queens. NY Presbyterian makes up the lion's share of Queens, yet their data was among the most accessible and readable data available.

The NYC Health+ hospital system also makes the data near impossible to view. All 5 of these hospitals provide data in the same format, a csv file that is greater than 1.3 gigabytes. The data contains over 3 million rows, which makes it impossible to load in Excel, which only allows slightly more than 1 million rows. As we saw in the market share portion, these hospitals are not particularly large, so it is not very logical that the files would be this big. Rather than listing the insurance companies along the x-axis as columns, NYC Health+ chooses to include a unique row for each insurance company,

Although we only needed to include 10 hospitals, I wanted to investigate the couple extra that were present in my markets. The two hospitals that I did not include were St. John's in Queens and St. Barnabas in the Bronx. St. John's only offered data for CPT codes, and St. Barnabas only offered a locked excel. You might say that St. Barnabas was technically compliant given that the data is available, you just can't export it in any other programs or do any math with it. In my opinion, this qualifies as non-compliant, as I would have had to manually retype every number to look at the data.

Section 5: Summary and Conclusions

I certainly learned a lot from this project. I learned that working with data is not easy. I learned a lot of new methods in python and excel that allowed me to gather and compute all of this data. In terms of what I learned conceptually, I certainly had no idea that Montefiore and NYP were so huge. I personally have never been to either hospital. I like that I empirically showed that their huge market share gives them the bargaining power to get the best negotiated payments. I do think that the price transparency initiative may help reduce hospital prices once it is enforced better. If I did not have a skilled software engineer friend, I don't think I would have ever been able to make that Montefiore file readable, and would have had no idea about their size and bargaining strength. One area that left me confused was why Bronx-Lebanon has a higher Medicare Payment than their gross charge.

[i] https://github.com/erikgregorywebb/nyc-housing/blob/master/Data/nyc-zip-codes.csv

[ii] https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Inpatient