

The Dataset

For this project we used the 2015 and 2020 General Payment Data made available by the Centers for Medicare & Medicaid Services, last updated January 21, 2022. For information about zip code income, we used the Median Household Income in Chicago, IL by Zip Code made available by ZIPAtlas, based on the 2010 US census.

The General Payment Data consists of ten million payments that make up ten billion dollars of value transfer from drug and medical device companies to medical professionals. From this dataset, we selected a few variables (recipient zip code; payer ID, name, and state; payment amount, form, and nature) from the payments made to Chicago based medical professionals.

We specifically selected Chicago because of its size, which would have a decent amount of data so that changes would be less likely due to randomness, and its relevance to the University of Chicago. The years 2020 and 2015 were specifically selected because they are far apart enough in time for changes in legislation to accumulate. Notable events between 2015 and 2020 include Donald Trump's presidency, Lori Lightfoot's election for Chicago's Mayor, and the beginning of the COVID-19 pandemic.

Manufacturer or GPO Source

In 2015, the companies that spent the most money on general payments were Gilead Sciences, Pharmacyclics, Aesculap, and Astrazeneca Pharmaceuticals. In 2020, the top companies were AbbVie, Pfizer, Boston Scientific Corporation, Astrazeneca Pharmaceuticals, and Medtronic USA.

Between these years, Gilead and Pharmacyclics had the largest decrease in general payments; AbbVie and Medtronic had the largest increase.

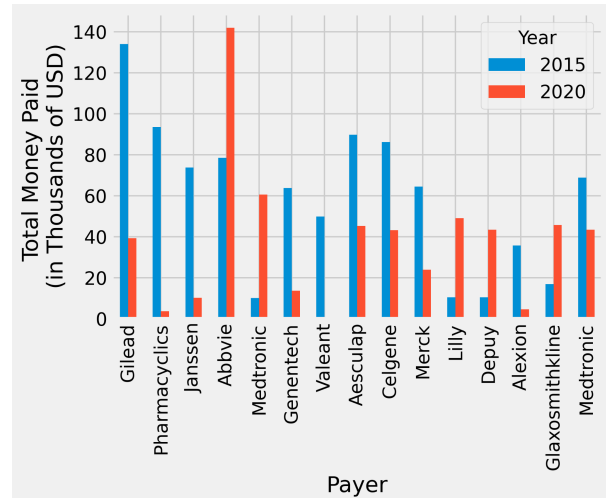


Fig. 1: Money Spent by Company

The change in Pharmacyclics and AbbVie, with a decrease of \$899,184.12 and an increase of \$633,810.64 respectively, was likely due to AbbVie's acquisition of Pharmacyclics for \$21 billion, first proposed in 2015. After Imbruvica (owned by Pharmacyclics) demonstrated strong clinical efficacy for extending the lives of terminal cancer patients, an acquisition was offered in 2015, which likely affected the distribution of payments made by the two companies. [1]

As for Gilead Sciences, the drug maker took multiple hits between the years of 2015 and 2020. At the end of 2015, its pricetag of \$1,000 for a pill for hepatitis C was slammed by senators in addition to public protests. In 2016, the deaths of patients taking its cancer drug led in addition to the loss of a patent hurt its stock price. Gilead's revenue also heavily relies on its hepatitis C drug, which has a limited number of accessible patients. [2] The combination of these events between 2015 and 2020 very likely caused a decrease in their budget, which would have led to a decrease in payments made.

Recipient Zip Codes

The dataset had a mix of basic five digit zip codes and ZIP+4 codes that were more specific. We truncated the codes to the first five characters in order to ensure we were

comparing the same type of objects (basic zip codes to basic zip codes, rather than basic zip codes and specified zip codes). To add context and meaning to each zip code, we added a column for median income in each zip code.

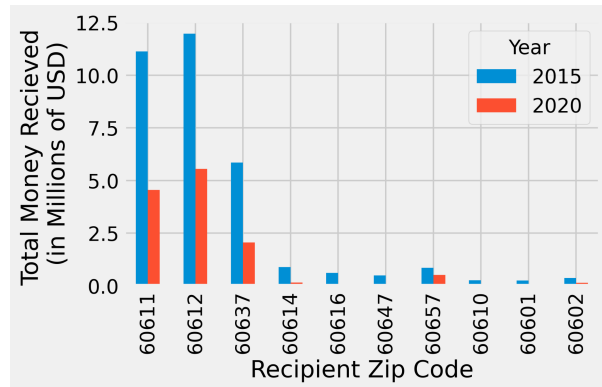


Fig 2: Distribution of Money by Zip Code

In both 2015 and 2020, the areas with the most money received had zip codes of 60611, 60612, and 60637. In these areas, the major medical centers are Northwest Memorial Hospitals, UIllinois and RushU Hospitals, and UChicago Hospitals. In these three zip codes, there were fifty-four physicians in 2015 that held ownership in a manufacturer or GPO. By 2020, the number dropped down to eleven. Investigating further into the major medical centers of the top zip codes, 60601's only relevant medical center seems to be the Centers for Medicare & Medicaid Services' own Department of Health & Human Services. [3] The only doctor in the ownership database 60601 for the two years was Dr. George Miz, a specialist in spinal conditions and a part of UChicago Medicine Medical Group. His office is now located on the outskirts of the city. [4]

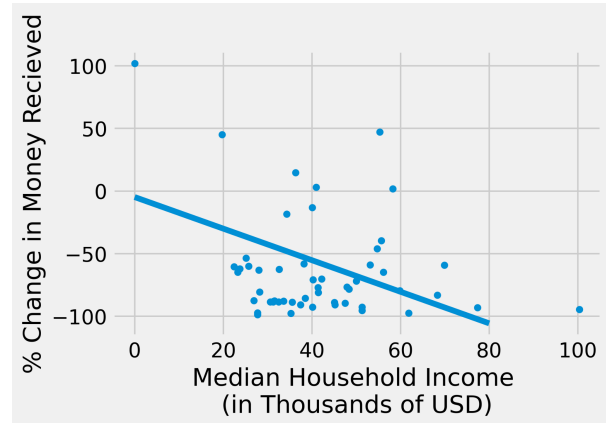


Fig. 3: Change in Money Received versus Median Household Income

The relationship between the median household income, used as a measure of the wealth for each zip code, and the percent change in money received for each zip code has a slight negative linear correlation of -0.328 . A better correlation could be found in the future with different best-fit lines. This relationship could be interpreted as a more even distribution of money between the zip codes. However, most of these changes (7 out of 54) are decreases, so it would be more accurate to describe the change between the two years as a general decrease, slightly more so for wealthier areas.

Nature of Payments

A breakdown of the change in nature of payments could explain this general decrease in payments. The nature of payments is the reason for transactions, and there are multiple types. The standard payment is often to pay doctors for their attendance to a training session on the use of a device. [5] Other reasons include speaker and consulting compensation, royalty fees, and travel and dining expenses.

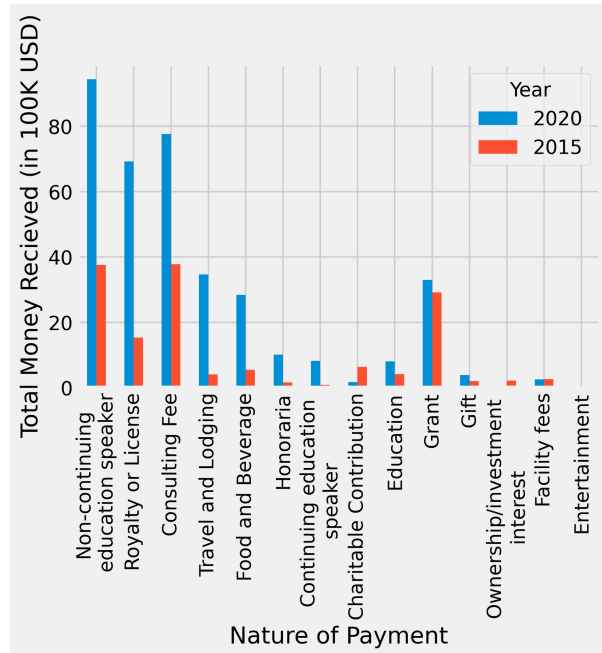


Fig. 4: Change in Nature of Payments

According to our data, the majority of the money in 2015 was not spent on training, but rather on paying doctors for speaking, consulting, traveling, and eating as well as grants. In 2020, the majority of the money was spent on paying doctors for speaking and consulting and grants. While the amount of money spent on grants did not change much between the two years, there is a significant decrease in the money spent on paying doctors on speaking, consulting, traveling, and eating.

In 2013, twenty-two doctors earned over half a million dollars in giving promotional talks and consultations for drug companies, and that number has grown to over seven-hundred doctors receiving more than one million dollars. However, even with the requirement from the 2010 Affordable Care Act for companies to publicly disclose payment information and the public analysis of those records, drug and medical device companies continued to pay doctors for dinners, sponsored speeches, and consultations, as a total of about two billion was spent each year between 2014 and 2018. [6] According to our dataset, it seems that

such payments significantly decreased by 2020. In July 2020, the US Justice Department announced a \$678 million settlement with a company that was bribing doctors to improperly prescribe drugs, after the persistence of a whistleblower at the company. [7] It seems that the continuation of efforts such as ProPublica to block medical device and drug companies from swaying doctors to using and prescribing their products through sponsored speeches, consultations, and free food and travel had a significant effect.

References

- [1] Jeremy Owens and Lisa M. Krieger, "Pharmacyclics' 'miracle cure': A cancer drug saves a biotech company," *The Seattle Times*, January 9, 2016, <https://www.seattletimes.com/business/technology/pharmacyclics-miracle-cure-a-cancer-drug-saves-a-biotech-company/>.
- [2] Address found on <https://www.dmas.virginia.gov/media/4190/va-21-0026-approved.pdf>
- [3] Eric Risberg, "Gilead has taken a lot of hits lately. Here's what it really has to fear," *STAT News*, March 24, 2016, <https://www.statnews.com/2016/03/24/gilead-financial-hits/>.
- [4] "George Miz, MD", *UChicago Medicine*, <https://www.uchicagomedicine.org/find-a-physician/physician/george-miz>
- [5] Danielle Kirsh, "These medical device companies pay doctors the most money", *MassDevice*, November 20, 2019, <https://www.massdevice.com/these-medical-device-companies-pay-doctors-the-most-money/>.
- [6] Charles Ornstein, Tracy Weber, and Ryann Grochowski Jones, "We Found Over 700 Doctors Who Were Paid More Than a Million Dollars by Drug and Medical Device Companies", *ProPublica*, October 17, 2019, <https://www.propublica.org/article/we-found-over-700-doctors-who-were-paid-more-than-a-million-dollars-by-d>

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- [7] Gretchen Morgenson, “It was his dream job. He never thought he'd be bribing doctors and wearing a wire for the feds”, *NBC News*, July 7, 2020, <https://www.nbcnews.com/business/economy/it-was-his-dream-job-he-never-thought-he-d-n1232971>