HW2: Insurance Market Data & Analytics

Due date: ask your TA

Context:

Centers for Medicare and Medicaid Services CMS is the agency governing the government insurance programs. Seniors age 65+ have the option to use traditional fee-for-service Medicare as their insurance or alternatively let a commercial insurance to insure them (Part C model). In Part C, Medicare still pays the beneficiaries' health insurance annual premium to the commercial insurance company on their behalf. Some beneficiaries however stay on traditional fee-for-service insurance and benefit from Part A and Part B coverage. In this HW the data analytics focuses on those who enroll for Part C also known as Medicare Advantage Plans (MA Plans).

In Part C, where Medicare delegates all insurance services of the 65+ US citizens who want to do Part C to another commercial private insurance company, the CMS requires all participating insurance companies to report back some statistics and performance reports to CMS. These insurance plans are also commonly known as Medicare Advantage Plans, or MA Plans. The CMS posts all MA Plans statistics and performance reports in a website for public use and also researchers like you. The MA Plan insurance market report databases are numerous, some large and some small, and come in different shapes and formats. In this HW we lay out some analytics on major topics and databases pertaining to MA plans.

Note that commercial insurances play a much bigger role in US healthcare beyond just Part C for senior citizens. These companies are at the same time insuring almost all of us who are not retired yet. For example some of you may have an insurance card by Blue Cross Blue Shield Company and I have mine from another insurance company. However, the painful fact is that when they insure us, there is little chance to get so much publicly available data and reports about what they do and how they run their businesses and what is their performance in terms of cost and quality of care. So bear in mind that most of the players in the Medicare Part C market for 65+ population that we get to know in this HW, are in fact the companies that are insuring younger Americans as well, but those younger population databases are not easily accessible for research because in that case they are not serving government, rather serving other non-government and private companies and employers to provide insurance to their employees (for instance Brandies is my employer and has contract with a few commercial insurance companies to insure its faculty and staff and perhaps students too). You will see that larger insurance companies like UnitedHealthCare or Blue Cross Blue Shield are major players in both younger population market, and the market for seniors under supervision of the government through Part C (MA Plans) contracts. In terms of data availability though, when they contract with the government (CMS), they are required to report all statistics to the CMS, but when they contract with other organizations for younger population, they have no mandate to reveal statistics or pricing or benefit package details or

other details about their secretive business practices. There are places where you can purchase some limited data and I can help you to find them if you are interested.

Scenario:

You own a consulting company and won a contract to assist the US Congress. (Please use the same states assigned to your team in HW1). Congress is interested to see in your states:

- If in future those states want to move to a private single payer model, which insurance company in each state is the best candidate to partner with.
- Separately another sub-committee in the Congress wants to learn how generous are the benefit packages offered by the major insurance companies in those states. They are most interested to investigate the coverage for dental services.
- Another sub-committee in the Congress wants to see which insurance companies (by state) are most mindful of opioid crisis and are doing their part to control it.

Data sources:

The left column in this website lists all the databases that are needed for this HW.

https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MCRAdvPartDEnrolData/index.html

In addition, there are additional files that you can find them on LATTE or in other locations in the internet as guided by the HW.

Question 1: Finding a partner for a "private single-payer" proposal – ONLY YOUR TEAM STATES perhaps we need to get rid of small size plans in each state

"Monthly Enrollment by Contract/Plan/State/County" gives the enrollment statistics by county level.

Name of the data file is "CPSC_Enrollment_Info_2019_10"

This enrollment file reports number of Medicare Part C beneficiaries that are enrolled in each plan.

Each Insurance company has multiple entities and organizations in different regions of the country. Then each local branch or subsidiary has multiple Contracts. Each Contract has multiple Plans. And each Plan can have multiple Segments. Medicare beneficiaries are enrolled in the Segments. If there is no mention of Segment in a database it means that the data is summed up at the Plan level. Yes, the whole insurance market is very messy, as I said in class ☹. So bear this messy hierarchy in mind as you work on this HW:

Insurance Company>>>Affiliated entities and subsidiaries>>>Contracts>>>Plans>>>Segments

When you open the "CPSC_Enrollment_Info_2019_10" database, it starts from the Contract level and goes down to Plan level. You have the Contract Number and then the Plan ID. Contracts are numbered by letter followed by a number (H0104, E0654, S7694, etc). The "Hxxxx" contracts and "Rxxxx" and "Exxxx" Contracts are for Part C health services, both Inpatient and Outpatients. The "Sxxxx" Contracts are for Part D which is the drug coverage. In this HW for simplicity we focus only on heath products and put the drug plans aside for now. So keep all the Hxxxx and Rxxxx and Exxxx contracts and EXCLUDE ALL Sxxxx CONTRACTS FROM YOUR DATASET.

Wherever the number of enrolled beneficiaries is missing or marked with * please drop the row from your database. Do not consider them as zero, drop them from the analysis altogether.

Now you want to know which insurance company is offering which contract (moving upward in the hierarchy). You need to download another database that lists Contracts offered by the local and regional subsidiaries of the larger insurance companies. That database is located in the same website in the section:

 "Monthly Enrollment by Plan". Name of the Excel file for the latest 2019 update is "Montlhy_Report_By_Plan_2019_10.XLS"

Again this Excel file lists both Hxxxx,Exxxx,Rxxxx and Sxxxx Contracts. You want to ignore the Sxxxx contracts. The variable "Organization Marketing Name" is what you need from this Excel file to find out which local/regional subsidiary offers which Contract. As you can see there are just too many Organization Marketing Names in this Excel file. Some of these names are created for marketing purposes. Some for branding and re-branding purposes. Then again like any other market over time there are a lot of Merger and Acquisitions in the insurance market too. The big fish eats the small fish. At the same time some go bankrupt etc etc. After all, the big name companies would survive and keep running the show. So what you need to explore is the real parent organization that is behind many of these smaller entities. In other words you are looking for the "big guys". To find the highest level of the hierarchy I have provided you with another Excel file on LATTE named "MajorInsuranceOrgs.xlsx". This Moaven-made file (!!!) tells you which MajorInsuranceOrgName is behind the smaller entities. These big names are exactly what you need to report to Congress as their potential partners. You need to link your "Montlhy_Report_By_Plan_2019_10" file with this excel file using the "Organizational Marketing Name" variable. Once you link the two files you will have the real owner of the Contracts (the MajorInsuranceOrgName) that is offering insurance coverage for Part C Medicare in the first Enrollment file "CPSC_Enrollment_Info_2019_10".

Now that your enrollment file has the name of the Major Insurance Company in it, you need to calculate the market share of each of the Companies in each state. Market share for each Insurance Company is simply sum of the enrollees (insured senior citizens) for any given insurance company, divided by the total number of enrollees in the state. At this point mark the Company with the largest market share.

Now imagine if you have a state with 25 major Companies and each having 4% ish market share. Who has the "lion share" for the Congress to partner with? Obviously nobody. This market is just too fragmented to be easily consolidated towards a "single payer". Compare it with a state that has 6

players in insurance market, and one company has 70% of the market share and the rest have the remaining 30%. This market is highly "concentrated" in hands of one big player and that player could be the company with enough of economy of scale and scope that Congress can rely on to delegate the mission of "private single payer" to. Since you are all from policy or business background, I would like you to calculate the Herfindahl-Hirschman Index (HHI) to measure each state's concentration of market power. Once you have the HHI calculated for each state, pick the top-4 states in terms of market concentration (four highest HHIs) and for those states list the company with the "lion share" of the market in your report to Congress.

Question 2: Examine the Insurance Benefit Package– ONLY YOUR TEAM STATES

Understanding insurance benefit package is very important. In this section we want to examine the generosity of the insurance benefit package for dental services. Not all the insurance plans offer dental care benefits and some only offer basic care and some other offer a more comprehensive plan that covers most of the dental services. Fortunately for Part C plans we do have access to benefit package detailed databases.

Answer two questions here: list the top-5 major insurance companies in terms of market share in your team's states. By states and by top-5 insurers please report:

a) What percentages of the enrollees enjoy the "Preventive Dental Items as a supplemental benefit under Part C"?

b) What percentages of the enrollees enjoy the "Comprehensive Dental Items as a supplemental benefit under Part C"?

Data: **same website**, Section: **Benefits Data**, folder: **PBP Benefits - 2020 - Quarter 1** (many similar file names for different dates, be careful with dates). Name of the data file: **pbp_b16_dental.txt** The database has all variable names in the first row.

Variable names/definition:

There is an Excel file in the same PBP folder for names and definition of all variables of all files. "PBP_Benefits_2020_dictionary.xlsx"

In order to answer the question you need to link this dental benefit database with your enrollment database on both Contract Number and Plan ID.

Hint: Plan ID in one file is formatted as the number with no zero in the left while in the other file formatted to be a three digit number (instead of Plan ID = 1 and 11 and 111 it has 001, 011, 111). So you need some leg work here to make your code work properly perhaps by creating a new variable in one of the two tables then link it to the other table. If you do not reformat your Plan ID values, the number of matching rows you get are fewer than what it should be and your results will be off by a lot. Sorry about that ☹

Hint: The pbp_b16_dental database reports the benefits by Contract/Plan/Segment while your enrollment file reports by Contract/Plan and does not have the details of enrollment by Segment. You have calculated the enrollment by Contract/Plan while the benefit comes one level lower to Segment. So when you look into the benefit database assume that the first Segment dental benefit (segment with the lowest number) applies to the entire Plan. Note that segment numbering can start with any number. Most of the time the multi segment Plans number the segments starting from 1, sometimes starting from some other numbers. So, find the first Segment, assume its dental benefit to entire Plan and move on.

Question 3: Quality of care and performance of the plans– ONLY YOUR TEAM STATES

As you all may know the drug addiction has become a national crisis in the US. Research suggests that prescription opioids play a significant role in addiction in the US. The US Congress wants to see which insurance companies are more pro-active in making sure their members are not on an unsafe dose of prescription opioids for a prolong period and reward and support their goodwill. HEDIS measures are popular in measuring the processes of care by providers and they do include a couple of measures for opioids prescription monitoring. **MA HEDIS Public Use Files 2018** is the latest update of the HEDIS measure set for the MA insurance plans. The good news is that you will have option to use text or Excel or MS-Access formats of the HEDIS reports in the website. The PDF files **HEDIS2018Doc.pdf** explains the HEDIS database in details. Note that HEDIS set includes many measures and each measure is reported in a separate file. You need to find the rate of drug use that is reported by the name *EOC170 - Use of Opioids at High Dosage (UOD)*

Report the rate for EVERY CONTRACT offered by the top-10 biggest market share insurance companies in each state. For the top-10 in each state can you calculate the weighted average of the UOD rate based on the enrollment number of the company? (for each company, list all the Contracts in each state, multiply UOD rate of each Contract by the enrollment size of the Contract in the state, sum them up, divide them by the total enrollment of the Company in the state where the Contract has a UOD rate. Do not add the Contracts with missing UOD to your denominator for the weighted average. Calculate this weighted average for all top-10 companies within each state and rank them from the worst (highest rate of UOD) to the best (lowest rate of the UOD).

Submission Format: Your submission needs to be a well written, well edited, well organized, technical report. Given the relatively generous submission team sizes in this class you will have to plan for division of both analytical tasks, and the reporting tasks. The quality of final report therefore is part of your final grade insuring your technical report writing skills are also improving, which is an extremely important qualification in a rather competitive job market! Name each submission as HW*x*-Team*y*.docx or .pdf

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Appendix 1: Assignment of US states to each submission team

IBS Class Submission Team Number	State Code	State Name
5	PA	Pennsylvania
5	NJ	New Jersey
5	IN	Indiana
5	SC	South Carolina
5	CT	Connecticut
5	MS	Mississippi
5	HI	Hawaii
5	SD	South Dakota