**HMP 669.001**

**Group Project**

##### Due: 4/23/2023 at 11:59 pm EST

**Objectives**

1. Gain familiarity with clinical and financial information commonly found in healthcare provider databases.
2. Obtain experience in interpreting data and in making decisions based on these data.

**Case Setting**

Midwestern Health System (MHS) has recently acquired Omega Hospital. The MHS Executive Committee would like to include Omega in current contract negotiations with two physician groups (a Cardiac group and an Orthopedic group) for a joint venture that has yet to be clearly defined. The Executive Committee is concerned that, without a clear understanding of historical utilization and intensity patterns, MHS will be unable to fully assess the impact of potential risk-bearing arrangements for which it is about to accept prospective liability.

**Background Information**

Recent attention on Medicare risk contracting and other provider-based risk arrangements highlight the need and usefulness of the ability to turn a set of historical data into meaningful information via database tools such as Microsoft Access. The crux of the matter is to identify key quantitative information that enables provider groups and health systems to analyze the potential advantages and disadvantages of signing risk contracts.

Current legislative activity is encouraging providers to enter new risk arrangements and effectively reduce the role of the managed care company - a new frontier in healthcare management that demands database and forecasting skills on the part of healthcare managers. In this case, your data analysis of historical utilization, intensity of care, and other factors will be critical to MHS's decisions regarding potential future joint activities.

**Assignment**

The MHS Executive Committee has entrusted you with the task of gathering, analyzing, and presenting key quantitative information (using actual historical data) that is critical to understand before entering contract arrangements with Omega. You are to present your methodology and results in a written report to the MHS Executive Committee. See Deliverables section below for details.

Your job is to translate Omega's historical data (which are available in MS Access database tables) into information that will serve as a quantitative foundation to guide the contracting discussions. You should provide the Executive Committee with a profile of Omega's patient base by service and summarize the reasons for and against contracting for Cardiac and Orthopedic services.

The MHS Executive Committee has asked that the following areas be included in your review.

**PS: the percentages shown for each section correspond to the grade weights of the group project assignment**

1. **Assessment of the Overall Patient Population and Current Facility Services (20%)**

A **suggested** list of evaluation criteria in this area is as follows:

* Top disease entities treated by each group (Cardiac and Orthopedic) as well as the number of patients in each of these disease entities
* Number of patients admitted for Cardiac and Orthopedic services.
* Demographics of these patient groups (age, race, gender), including geographic location (zip-code linked socio-economic factors, distance from hospital)
* Relevant admission/discharge (disposition) data for these patient groups
* LOS (length of stay) information for these patient groups
* Qualitative assessment of the importance of Cardiac and Orthopedic services

1. **Intensity/Utilization Indicators (20%)**

The issues in this area include:

* What are some key data clues that suggest that the MHS Executive Committee should or should not accept risk via contracts for Cardiac and Orthopedic services?
* What is the current status of the quality of care received by patients admitted via the ER?
* What is the intensity of resource utilization for these services?

A **suggested** list of evaluation criteria in this area is as follows:

* Reputation of Omega: How far do these patients travel to receive Cardiac and Orthopedic services at Omega compared to other services?
* Death rates
* Percent of encounters where service provided was teaching-related
* Physician/surgeon information (e.g., admitting physician, specialty type, operating surgeon)
* Percent of visits requiring an external review
* ICU/CCU information (e.g., was a stay in the ICU required; percent distribution of patients by LOS in CCUs; type of CCU where care was received, ALOS -average length of stay- in each unit-type)
* Principal operations performed on each group (e.g., the number of patients having operations, the average number of operations performed, major types of operations performed)

1. **Financial Viability (20%)**

A suggested list of financial measures includes:

* Profitability of patients from Cardiac and Orthopedic services
* LOS outlier rates
* Payer mix
* Rates of emergent vs. elective care
* Probable future demand given Omega's patient demographics for Cardiac and Orthopedic services (this is less of a coding/query question, and more of discussing what you can an infer from demographics and trends)

1. **Validity and Scope of Analysis (10%)**

* Discuss any validity concerns you have regarding the data used for your analysis
* Discuss data problems you discover while performing your analysis
* Discuss briefly any additional data (or types) you might need to have available to perform a full assessment of potential contracting liabilities

1. **Deliverables (30%)**

Your report should not exceed 5 pages (the page limit does not include Appendix and References), and should include the following:

1. A concise executive summary
2. A concise statement of the potential benefits and risks of establishing "carve-out" contracts with physician groups and insurers
3. Your analysis in the categories outlined above. Attach field descriptions to fields with numeric codes in your presentation materials (e.g., DRG codes should be accompanied by their descriptors). Please do not overwhelm your report with unnecessary and redundant details – use your discretion and find a balance to give a comprehensive but cohesive analysis (what’s the story!)
4. Your recommendation as to whether MHS and Omega should proceed with carving-out Cardiac and Orthopedic services
5. Copies of your output from Access and R/Excel, including in any combination of the following: lists, graphs, tables, figures, charts. Refer to (3) above in deciding how to display your output. Summaries/overviews of the results should appear in the body of the report, with details appearing in the Appendix. You are encouraged to submit your .Rmd files in the appendix

Include the UMID numbers and names for each group member on your report. Only one copy of the report, along with appropriate accompanying files (e.g., .accdb, .Rmd, .html, .xlsx etc.) should be submitted electronically for each group. Every student will also be required to submit an anonymous peer review form to ensure team-members have contributed in a fair manner.

Some tips to writing a good report:

* **Know the audience:**
  + Your audience is the MHS Executive Committee. Assume the committee comprises highly educated members, but they aren’t interested in (at least the main report) in all the querying and programming details. Your audience is not your course instructor or GSI.
  + Tailor the writing style, choice of tables and figures based on your audience.
* **Narrative:** 
  + Don’t lose sight of the overall narrative – it’s often easy to get lost in the weeds. It’s always a good practice – every now and then - to take a step back and evaluate how the narrative is coming together. When working in groups, members can take turns doing that or designate one of the members to take ownership of that task. A cohesive and comprehensive report is what we are looking for.
* What goes in the main body of the report?
  + A thoroughly researched report need not be overtly dense. Include details in the main body which are in sync with the overall narrative you are weaving.
  + Additional checks or tests you might have run, other plots you think are important but have contextual overlap with existing plots or tables, supporting evidence for some of the sub-narratives etc. - can (and often should) always be included in the appendix.
* Tables and Figures:
  + Size and position your tables and figures appropriately to ensure they are clearly legible. Be consistent with designs of your tables and figures.
  + Be consistent with formatting and numbering tables and figures (in the main body and in the appendix). Include appropriately sized captions/notes with tables and figures to inform the committee what they are looking at.
* Others:
  + Structure your report into sections, divided by headings and subheadings, to facilitate browsing and scanning
  + **Citations**: If you’re using information from another source, cite them appropriately using any of these [citation styles](https://guides.lib.umich.edu/c.php?g=282964&p=1885443).

**FAQs:**

This is **not** a homework assignment. You are helping a client make sense of this messy DB, so approach the problem that way. Though not required, you are welcome/encouraged to use external sources for supplementing information given to you.

* **The tables have duplicate entries, values which are missing/null, confusing field names …**

The DB is, by design, chaotic and messy. You will be expected to make several decisions yourself, and you are welcome to explain your choices made in your report.

* **Can we do the analysis in MS Excel, or can we do it all in R, instead of in SQL?**

You have complete discretion in your choice of platform. We will look at only the final report (or the RMD file to be knitted into the report).

R does have several ways to do aggregation and data cleaning-and-analysis, which might be easier. At the same time, the DB also has many tables, and some of them have many entries, not all of which might be relevant to the questions you are answering. In that case, you might choose to not to load all those datasets into R directly (try it out for yourself). Recommended practice: be selective in which datasets (or tables resulting from SQL queries you import into R for subsequent analysis), and then work off there.

* **We don’t see any Relationships in the DB file.**
* Figuring out the table relationships is part of the group project. If needed, we will share hints on a subset of the relationships between the tables. Note that the table all of them are connected to is the **OMEGA** table. You might need to create some fields or tables (you have all the info you need to create those tables/fields).