

Solving a Healthcare Challenge – A Peer Reviewed Assignment

The objective of this assignment is to give you more opportunities to think about solving some of the challenges we have been discussing throughout this course. You will review healthcare data and think about problems at a conceptual level—you are not required to access datasets or perform data analytics. You will describe a problem area in healthcare that you want to focus on for improvement, the data that you found on a state's portal, and how you plan to address the challenges for improvement. You will create and upload a one to two-page PDF report that could be submitted to leaders from a healthcare organization who might want to solve the problem area that you have selected.

This project has multiple steps that will build on each other and that you will be graded on. Here is a summary of the tasks:

1. Pick a [US State](#) and study the “open data portals” that provide access to data and metadata.
2. Choose an area in healthcare that has opportunity for improvement.
3. Create a concept map to identify important concepts and their relationships to each another that helps address how information can lead to decisions which improve your problem area (recall lessons in Module 2). For example, if you want to reduce costs and improve quality by reducing hospital stays, you need to identify what concepts define this problem areas (e.g., hospital admission, hospital discharges, reason for admission, patient illness).
4. Consider the importance of at least two medical terminologies for your problem area.
5. Describe how your problem area could be better understood by combining data from at least two different data sources. Describe possible challenges with data harmonization and integration.
6. Building on Step 4, provide some detailed description about what fields you might use to link data from various sources.

Step 1 – Choose Data Sources and Problem of Interest

Pick a US State and study the “open data portals” that provide access to data and metadata (see links provided). You can build off the work that you already started in the previous lessons. For example, for Module 4, you looked at freely available data from a US state and started to think about data harmonization challenges. You are welcome to continue with the data that you have already studied. However, it is important to review the steps below to make sure that you choose datasets that will allow you to address each step. For example, given that we have a topic area below related to medical terminologies, it would be helpful to pick at least one data source that involves medical domains and medical terminologies.

Data Sources. Many states in the United States are making an effort to make more data and information publicly available. Students will look at the “open data” portals for either New York, California, or another state of their choosing:

- New York - <https://healthdata.ny.gov/>

- California - <https://data.chhs.ca.gov/group/healthcare>

Step 2 – Choose a Healthcare Problem of Interest

Once you have studied various data sources, choose an area in healthcare that has opportunity for improvement and clearly state the area you have chosen and why. Some areas you might select include topics covered in the lessons:

- High costs and waste
- Slow progress moving scientific interventions into clinical practice
- Fragmented and uncoordinated care
- Problematic patient management

You are also allowed to choose a different problem area more in the area of public health. Whatever domain area you pick, consider all the steps outlined in the project. For example, you will be asked to think about how medical terminologies are important for the problem, and how data integration among disparate data sources could be useful.

Step 3 - Concept Mapping

This step builds off the lessons in Module 2 – thinking about concepts and their relationships, and then summarizing these with concept mapping software.

As you learned, it is often important to consider the problem area that you have selected before getting into the details of the data. Create a concept map using the CMAP tool to illustrate the important concepts and the relationships among the concepts for your domain area. The concept map should have at least 15-20 concepts and show some of the relationships between the topics. For example, if you are studying high costs, you might make a map that illustrate various aspects of the healthcare system that leads to high costs (e.g., long hospital stays, utilization of expensive services). Later you can think about how you can find data within the open source portal to measure some of these concepts. Include a .jpeg or .png image that clearly illustrates the important concepts and the relationships among the concepts for your domain area in your PDF report of your concept map.

Step 4 - Medical Terminologies

In the Module 2 lessons, you had an opportunity to review some of the common data standards used in medicine and think about how challenging it can be to link concepts, especially when the semantic meaning differs among the databases.

In this step, you will review your data sources to identify the following:

- What medical terminology systems are used in the data? If you do not find any standardized codes, find at least two concepts in the data that could have been captured using standard codes.
- In 3-4 sentences, explain how these standardized codes might help your analyses.

Part 5 – Data Harmonization/Integration

In this step, you will consider how various data sources within the state open data portal might help you create actionable information to solve your health problem described in step 1. Please include the following in your report:

1. Identify your primary data source that you think you could use to solve your particular analytical problem and why you chose it. For example, if you are concerned with long hospital stays, you can look at inpatient data sets.
2. List and describe at least two other data sets that could augment or improve your analyses and why you chose them. For example, you might think it is important to know if your particular hospital patients had various types of health coverage. You might also want to know if particular counties or regions of the state has patients who receive abnormally long lengths of hospital stays also have other public health problems such as high poverty rates or high obesity rates.
3. Once you have described at least 2 data sets, go on to describe how it might be challenging to integrate the data for analysts.

Part 6 – Record Linkage

In the final step, you will build on Step 5 and document how you would work with an analytics team to link data from the various data sources that you have described and why. You can look at the data and the meta-data to think about what fields are available for linkages. In your overall report, create a “Record Linkage” section that provides about 2-3 sentences to address each of the questions below.

- What fields could be used to link the data sources?
- What types of linkage methods might you try?
- Would these fields be sufficient to obtain high-quality matches? Why or why not? How would you know?
- What privacy or legal concerns might arise during this linkage effort?
- Anything else about the data you noticed?