INTRODUCTION TO HEALTHCARE VALUE AND DATA ANALYTICS

COURSE DESCRIPTION

As the amount of data grows exponentially in healthcare, there is an urgent need for professionals who can manipulate and make sense of healthcare data efficiently and effectively. Progress in increasing healthcare value through higher quality and reduced cost is limited by the lack of human capital to turn data into improvements in efficiency and downstream outcomes.

This course serves as the first step into the world of healthcare data and analytics and it will build a solid theoretical and technical foundation. While the course requires hands-on practice with detailed data, the importance of understanding an organization's broader strategic objectives and vision will be emphasized. It is designed to develop healthcare leaders who can understand the details as well as think critically beyond the data.

The contents will focus on five themes related to managing a healthcare provider organization: finance, quality, market, operations, and utilization. While each theme is unique and important, they are closely linked to each other. Each session is based on two parts:

Lecture: We will review the theory such as data formats, database structures, and analysis methods along with how data is collected, prepared, and used. We will also cover the history, current topics, and future needs for each session's topic.
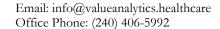
Practice: Real world problem sets will be provided for each session.

Upon completing the course, you will be able to:

1. Become proficient in data analysis, visualization, preparation, and database management/querying
2. Utilize financial, market, quality, operational, and utilization data in decision making
3. Define the data needs for a problem then deploy appropriate analytical tools and methods
4. Incorporate health equity and Social Determinants of Health in generating insights
5. Communicate effectively with technical (IT and Data) and non-technical teams (Clinical and Business)

For Microsoft Excel:

Become proficient in data analysis
Use filters to isolate data sets
Derive calculations and conduct analysis using custom formula
Learn shortcuts in deriving descriptive statistics
Learn how to create and use pivot tables
Plot histograms, scatter plots, and line graphs
Derive a linear regression equation and graph
Use mean, median, and percentiles appropriately

Create time-series graphs using different time intervals
Statistically test the difference based on averages and rates
Use t-test and chi-square test to calculate the p-value
Use compounding and simple growth rates appropriately
Learn the advantages and disadvantages of a spreadsheet-based tool
Learn frequent mistakes and oversights in data analysis

For Microsoft Access:

Become proficient in database management and querying
Learn how databases, tables, and fields are related to each other
Build a query and apply custom criteria to the output
Create a new field based on a formula
Learn how to group and aggregate values in a field
Understand how the level of detail affects aggregations of data
Conduct basic arithmetic
Learn the limitations in analyzing and visualizing data
Save queries and update data sets automatically
Learn how to check the quality and completeness of data
Learn how to join data sets and extract cohesive information from multiple sources
Learn how to export results for additional analysis
Learn the advantages and disadvantages of a database management and querying tool
Learn frequent mistakes and oversights in running queries

For Tableau:

Become proficient in data visualization
Learn how to create automated dashboards for continuous performance monitoring
Use the filter feature to apply custom criteria across multiple visualizations at the same time
Learn how to add features and enhance data visualizations
Learn how to create time-series graphs
Learn how to conduct rapid fire data exploration using actions
Learn how data is classified as dimensions and measures
Learn how data is classified as discreet and continuous
Learn how to calculate metrics from data and visualize them
Use calculated fields to create additional data types
Build proficiency in using built-in quick calculations
Learn what data visualization is the most appropriate for different situations
Learn how to draw a trend line and generate a linear regression equation
Use boxplots and percentile values to analyze data
Learn how to use geospatial mapping features
Explore multiple methods of visualizing for the same purpose
Learn the advantages and disadvantages of a data visualization tool
Learn frequent mistakes and oversights in developing data visualizations

For Alteryx:

Become proficient in data preparation
Connect to multiple data sources at the same time
Use data format types appropriately for text and numerical values
Use filters and formula functions to prepare data for analysis and visualization
Conduct ad hoc analysis to calculate sums, differences, products, and rates
Learn how to separate data into distinct pieces and merge them using the Union function
Learn how to Join datasets using common indices
Efficiently audit data quality and diagnose errors in the data preparation process
Use the search and browse functions for agile drill downs into detailed data
Aggregate data appropriately and calculate metrics at different levels of aggregation
Understand the concept of data granularity and levels of detail
Learn how to clean raw data and make it usable for analysis and visualization
Learn how to use the formula function and create new fields based on programmed logic
Learn how to create and use repeatable processes for automation
Learn the advantages and disadvantages of a data engineering and preparation tool
Learn frequent mistakes and oversights in building data processing workflows

Intended Audience
Any healthcare provider, data analyst, management professional, or student looking to jump start their skills in applying data analytics while understanding the business, clinical, or research objectives. This is an introductory course and will cover the fundamentals of healthcare data analytics and healthcare management focused on improving value (i.e., no prior data experience required). The course provides hands-on training with real data and software tools that will transform you into a data superhero who understands healthcare organizations' imperatives.

Required Reading
[Data to Value: How to Unleash the Power of Data for Better Quality and Lower Cost Healthcare](#)
by K.H. Ken Lee

Required Software
Microsoft Excel, Microsoft Access (Only available on Windows), Tableau, and Alteryx Designer (Only available on Windows)

For MAC (Apple OS) users: Microsoft Access and Alteryx are not available on the Apple OS. Use a parallel software to run Windows on your computer or create a virtual machine account with any vendor such as Amazon Workspaces or Microsoft Azure.

Tableau Public is free and can be downloaded here: https://public.tableau.com/en-us/s/download

Alteryx Designer has a free trial version at: https://www.alteryx.com/products/platform-details/product-trials

Although we will use these specific software programs, other software programs will have similar functions and the methods covered in the course will be transferrable.

COURSE PLAN

As you progress through the course materials, reach out to us at any time if you have questions. We will respond within 24 hours.

ACTIVITIES
Review the Course Syllabus **Lectures** Course Introduction Session 1 Lecture: Basics of Data Analytics Session 2 Lecture: Financial Data in Healthcare Session 3 Lecture: Utilization and Operations Data Session 4 Lecture: Quality Data in Healthcare Session 5 Lecture: Project Management and Data Visualization Session 6 Lecture: Market Data in Healthcare Session 7 Lecture: Integration and Course Summary **Course Data and Problem Sets** Problem Sets and Solutions Course Master Database Data Dictionary **Tutorials** Getting Started with the Software Program