Health Analytics  
HEMA-940-5  
Spring 2018 – 1st 5 weeks

Course description

The need for health analytics is growing. As health care spending in the US increases and medical technology innovation continues, a variety of stakeholders are looking to health analytics to help them understand the forces driving spending growth and determine strategies to stay competitive. However, conducting valid and reliable analyses can be challenging. This course introduces students to health analytics with an emphasis on the elements and uses of administrative health insurance claims data. The course aims to provide the foundation for designing an analysis, as well as provide experience conducting analyses. Topics such as measuring severity, quality, price and expenditures will be discussed in the context of analytic applications, such as cost-effectiveness analysis and public reporting. The course work will also discuss the limitations of health care data and analytics. Weekly in-class exercises and a group project will allow students the opportunity to gain firsthand experience with the types of problem solving, decisions, and methods required of sound health analytics.

Course objectives

After completing this course, students will have the skills needed to:
- Identify the various audiences and uses for health analytics,
- Know how to assess the benefits and limitations of potential data sources and methodologies,
- Understand the implications of the design and assumptions underlying an analysis,
- Plan, conduct and present their own analysis.

Class information

This class meets Mondays from 6:30 pm to 9:30 pm for the 1st 5 weeks of the Spring 2018 term

Class format

Each class will consist of a mix of lecture, discussion, and in-class problem solving exercises related to the week’s material. The discussions are intended to provide experience assessing the strengths and weakness of analyses. You will be expected to come to class having read the materials prior to class and prepared to participate. The in-class exercises are intended to provide practice with the types of problem solving and critical thinking commonly needed when conducting analyses. The exercises are intentionally challenging and do not necessarily have a “right” answer. In addition to the in-class activities a 5-week long group project will incorporate the course materially into an analytics exercise culminating in a short paper and presentation to a small panel of health analytics and health industry experts. (Note, some class time will be reserved during each week to discuss the progress of the larger group projects as well.)
Instructor information

Contact information

Eric Barrette, Ph.D.
Director of Research, Health Care Cost Institute, Inc.
Email: ebarrette@healthcostinstitute.org

Office Hours: By appointment – Please contact instructor.

Teaching philosophy

I want my knowledge and work experiences to be valuable to students interested in how research and data can inform health care policy and business. Throughout my academic training and professional career, I have had the opportunity to work on many projects composed of with multi-disciplinary teams of economists, information scientists, political scientists, medical care providers, actuaries, accountants, attorneys, and business executives. In my courses and lectures, I strive to impress upon students the need to apply the class content from an objective perspective and the need to think critically about the topic at hand. Moreover, I believe the best learning environment is one of fairness, equity, and respect when everyone is able to make a valuable contribution to a project or a class discussion. To create such an environment, I expect everyone involved to uphold these principles, including myself.

Grading

Distribution of grade

The final grade will consist of a combination of in-class participation, weekly assignments, and a final group project presentation and paper.

- Participation (20%): The participation grade will be based on participation in the weekly in-class discussions and exercises.
- Weekly assignments (40%, 10% each): A short reflection paper will require you to think critically about and apply the concepts discussed in the readings to health analytics. Readings will be assigned at the beginning of weeks 1 through 4 with papers due before the start of class the following week. The readings are the basis for the following week’s discussion.
- Group project (30%): The project and groups health analytics project will be assigned in the first week of class. Groups will be expected to incorporate what they learn throughout the course into an analysis with a presentation (15%) in week 5 and short report (15%) due by the end of week 5.
- Peer-review (10%) Peer reviews by group members based on your contribution to in-class exercises and the group project will make up the final part of the grade.

Grading of weekly assignments

During weeks 1 through 4, you are expected to write short papers (2-4 pages) evaluating the week’s readings. These readings and your evaluations are intended to be a starting point for the in-class discussions the following week. To receive full credit, you are expected to present a response to the assignment question/discussion prompt. Your paper needs to do more than summarize the readings, but you are expected to use the details of the readings to support your argument. Full credit will be given for papers that present a concise, coherent responses, supported by the readings. (You may also choose to cite other materials to support your response but it is not required and should not be substituted for the assigned readings.) Partial credit will be given when aspects of the paper are responsive to the question
but the arguments are not fully developed or supported. No late papers will be accepted for credit without prior approval from the instructor.

**Grading of group project**

The intent of the group project is to work through the planning, assumptions, execution, and presentation of results required of health analytics project. Groups and topics will be chosen in the first week. Short presentations (approximately 20 minutes) by each group will be made in the final class. Full credit will be given to presentation that articulately state the question, describe the analysis, and explain the results. Similarly, the full credit for the report (10-12 pages) will be given to papers that concisely and coherently discuss the project and findings. Presentations slides will be due Sunday before the final class so they can be distributed to the panel. The final report will be due at the end of week 5. A project outline will be due in week 3 to ensure the groups have the time and resources needed to successfully complete the project.

**Course Policies**

**General Expectations**

You are expected to attend all classes for the entire class session. If you have an unavoidable conflict, please let the instructor know in advance as soon as possible. All assignments are expected to be completed and turned in by the date and time listed on the syllabus. Late work may be accepted in the case of unforeseen/emergency circumstances. The decision of whether to accept late work or allow for make-up work will be made on a case by case basis at the discretion of the instructor subject to University policy.

**Student Academic Integrity and Scholastic Dishonesty**

This course adheres to the guidelines established in the Kellogg Honor Code and the Kellogg.

**Course Outline**

**Week 1: Data Sources**

- Introduction to health analytics – audience, need, uses, etc.
- Health Data Introduction
  - Types of data: Primary vs secondary
  - Sources of data: Surveys, Clinical trials, Medical records, Claims, Other sources
  - Uses and limitations
- Administrative claims data
  - Types of data
    - Commercial, Medicare, Medicaid, and Other sources
    - Membership, Inpatient, Outpatient, Physician, Rx files
  - Data elements
    - Demographics
    - Claim form codes (e.g. HCPCs, ICDs, etc.)
    - Derived codes (e.g. DRGs, MDCs, etc.)
    - Identifiers (e.g. NPIs, TINs, Medicare Numbers, DEA numbers, etc.)
- Research design and methods for claims data analysis
  - Correlation vs. Causation
  - Specifying research questions and operationalizing research questions
  - Big data vs a lot of data
Week 2: Health Care Costs

- Basic definitions: costs, expenditures, prices, charges
- Payment design underlying claims data
  - Capitation, fee-for-service, prospective payment, reimbursement, global/bundled payments
- Measuring costs
  - Direct and indirect costs
  - Resource use measures
- Measuring and reporting spending and prices
  - Procedures, episodes, condition based
- In-class exercise: Calculating prices from claims data
- Readings for week 3: TBD

Week 3: Measuring health & quality

- Uses of claims data vs clinical data
  - Measuring incidence and prevalence
  - Health outcome measures
  - Health care quality measures
- Health related quality of life measures & quality adjusted life years
- Measures of illness, severity, co-morbidity
- In-class exercise: Measuring and reporting quality from claims data
- Group project outline due.
- Readings for week 4: TBD

Week 4: Uses of health analytics

- Cost Effectiveness
  - Cost-analysis
  - Cost-benefit analysis
  - Cost-effectiveness analysis
  - Cost-utility analysis
- Public reporting
  - Price transparency
  - Provider profiling
- Health policy evaluation and design
  - Evaluating the ACA
  - Competitive effects
- In-class exercise: Data requirements for cost-effectiveness analyses
- Readings for week 5: TBD

Week 5: Health analytics in practice

- Group presentations and Q&A with expert panel
- Group project slides due Sunday night
- Group project paper due by end of the week