Health Foundations Module

SECTION 1: MODULE OVERVIEW

Introduction

The Financial and Health Economics Module discusses a macro view of the health care system. This module, Health Foundations, discusses the health care system at a micro level. It explains health care terminology and coding. Without understanding this terminology and coding, health care data and research cannot be understood, effectively assessed for quality, nor effectively used in actuarial work.

Coding

The health care system is complex and constantly evolving. Health care coding structures are used to describe and organize this system. These coding structures are the language of health care. They facilitate the flow of funds between entities by identifying procedures, diagnoses and treatments. They are used to describe symptoms and disease states of patients. The coding structures allow all parties in the health care system to communicate in a common language. The codes are the basis of performance measurement, quality reporting and medical management. They are used for public health research and reporting.

Data

In this module, clinical data will be introduced through disease state summaries, clinical policy bulletins and an introduction to understanding medical research papers. The use of internal company data stored in vast data warehouses will be examined. Finally, the integration of the multiple administrative systems that support the administration of health insurance and its medical management will be explored. An understanding of each of these data sources is vital to health actuarial work.

United States Disclaimer

This module will use the U.S. health system as the primary example, since its complexity will provide a clear demonstration of foundational health concepts. Many coding schemes and data sources are universal throughout the world. Although additional country specific coding schemes are not addressed here, they are likely to have similar structures and similar limitations to the schemes that are discussed in detail.

Module Objectives

After you complete this module, you will be able to:

- Define medical terminology and coding and its relevance to health actuarial work.
- Interpret sources of health data and decide which to use and how to use them.
- Describe claim data in a data warehouse and evaluate that data for quality.
- Identify other administrative systems and describe the interrelationships between them.
- Describe the purpose for and applications of predictive analytics in health care.

Module Sections

The Health Foundations module consists of six sections.

Section 1. Module Overview (You are here, now.)

Section 2. Medical Terminology and Coding

Section 3. Use of Medical Terminology and Coding

Section 4. Data Warehouse Detail and Data Quality

Section 5. Interrelationship of Administrative Systems

Section 6: Predictive Modeling.

Section 2 is intended to provide a background in medical terminology and medical coding. Section 3 then expands on that knowledge by describing data sources for actuarial work whose use requires an understanding of the terminology and coding. Section 4 then examines in detail the information in the data warehouse, which is often the primary and most important source of medical data in an actuary's work. Section 5 will explore the interrelationship of administrative systems. Finally, in Section 6 will address applications of predictive analytics in healthcare.

In addition, this module contains an End-of-Module Test and an End-of-Module Exercise.

SECTION 2: MEDICAL TERMINOLOGY AND CODING

Introduction

Each profession has its own nomenclature for communicating among its members. A health actuary must be able to converse in both the language of an actuary and the language of a clinician. In many roles, understanding diseases and treatments for them will be part of everyday work. An actuary must be able to understand and use clinical information even though a deep understanding of the true biologic processes behind the information might be lacking.

Every complex system needs a way to organize itself. Items need to be tracked and identified. Just like a store has departments and product codes, health care data has its own coding structure. You will be introduced to that coding structure in this section. It is the language in which the entities within the health care system talk to each other. It is the language used for the payments and flow of funds. It is also the language of health care data analytics. In particular, this section will examine:

- Medical/Rx terminology and diseases.
- Medical coding introduction.
- Dynamic nature of medical coding.
- Impact of a change in coding structure on provider reimbursement.

Objectives

After you complete this section, you will be able to:

- Identify various medical terms and diseases and treatment options relevant to actuarial work.
- Describe how other professions interrelate with health actuarial work.
- Identify and explain the coding sets used in health practice.
- Describe how coding sets change over time and evaluate the potential impact on actuarial analysis.
- Evaluate impacts of changes in coding structures on provider reimbursement.

SECTION 3: USE OF MEDICAL TERMINOLOGY AND CODING

Introduction

The second section of this module covered the basic structures and uses of healthcare terminology and coding. This section covers the application of that terminology and coding knowledge. Specifically, it covers the various data sources of health care information. To appropriately use those data sources, an actuary must have a basic understanding of the language of healthcare actuarial work: healthcare terminology and coding structure. In particular this section will examine:

- Clinical Policy Bulletins (CPB).
- Data sources: public versus private.
- Types of studies.

Objectives

After you complete this section, you will be able to:

- Describe clinical policy bulletins and interpret the information they provide.
- Distinguish between public versus private data.
- Evaluate the types of study methods.
- Characterize studies by method.
- Research a question using multiple data sources.

SECTION 4: DATA WAREHOUSE DETAIL AND DATA QUALITY

Introduction

In the second section of the Health Foundations module, you learned about the complexity of health care coding. This section will cover data warehouses, data quality, data mining and claims systems. In most health plans, the vast collection of claim data is stored in a data warehouse. The warehouse is a set of relational tables built to support querying and analysis. If you are not familiar with the concept of a data warehouse, it can be thought of as an enhanced excel spreadsheet. There are different tables (think different tabs), with certain fields on it (think columns), and millions of records (think rows).

Objectives

After you complete this section, you will be able to:

- Describe a data warehouse and how it is used to store heath care data.
- Evaluate the quality of data warehouse data.
- Describe the impact on actuarial work of a change in claim system.
- Identify the uses of data mining techniques in health actuarial work.

SECTION 5: INTERRELATIONSHIP OF ADMINISTRATIVE SYSTEMS

Introduction

The focus of the module to this point has been on the medical claim data at a health plan and the systems used to hold that data. Although the medical data is the most complex and largest data set, there are many other sources of data that may be useful to an actuary. Depending on the company, this data may or may not be in the same warehouse as the medical claim data. The information may be in separate datamarts or other tools. On the other hand, some information may not be available via any efficient means.

Objectives

After you complete this section, you will be able to:

- Identify other administrative systems such as eligibility, billing, benefit design and rating, and how they affect actuarial work.
- Interpret common data flows between administrative system and the importance of that interaction.
- Evaluate data sources for commonly used actuarial data elements.

SECTION 6: PREDICTIVE MODELING

Introduction

Predictive modeling is an analytic process that is intended to estimate an expected future state (or likelihood of an expected future state) based on patterns identified in current and historical data. Examples in health care include models intended to identify "high cost" patients (those who account for a high percentage of health care spending), or patients with a high probability of a particular outcome, such as an inpatient admission, in a future time period.

Objectives

After you complete this section, you will be able to:

- Describe many common applications of predictive analytics in health care.
- Differentiate between different types of risk score models.
- Describe common healthcare data sources and challenges for predictive modeling.
- Discuss key considerations specific to the use of healthcare claims in model development.
- Describe ethical considerations for actuaries developing predictive models.