Chapter 17
Discussion

INTRODUCTION

Now that the data are more readily available for outcomes research and the techniques to analyze that data are available, we need to use the tools to investigate the total complexity of patient care. We should no longer rely upon basic tools while ignoring sequential treatments for patients with chronic diseases or the issue of patient compliance, and we can start investigating treatments from birth to death. It is no longer possible, with these large datasets, to rely on t-tests, chi-square statistics and simple linear regression. Without the luxury of clinical trials and randomizing patients into treatment versus control, there will always be confounding factors that should be considered in the data. In addition, large datasets almost guarantee that the p-value in a standard regression is statistically significant, so other methods of model adequacy must be used.

If we do not start using outcomes data, we are missing crucial knowledge that can be used to improve patient outcomes while simultaneously reducing the cost of care. If we continue to use inferential statistical methods that were not designed to work with large datasets, we will not extract the information that is readily available in the outcomes datasets.

BACKGROUND

As discussed in Chapter 1, data preprocessing is not given strong consideration in the medical journals. There are just a few books that discuss preprocessing
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generally. (Pyle, 1999; Refaat, 2006; Svolba, 2007)

There are a few books that focus on analyzing the electronic medical record; however, they spend little time on the preprocessing. (Begg, Kamruzzaman, & Sarker, 2006; Weerasinghe, 2009) While it is suggested that the major problem is to find appropriate data, we suggest that it has more to do with making appropriate use of the data that are available. (Mark, Salyer, & Geddes, 1997)

The number one question remains how best to handle the patient co-morbidities as represented in ICD9, CPT, and HCPCS codes. Without techniques that can handle all of these codes to investigate the relationship of co-morbidities to codes, some of the most severe, acute conditions are omitted. We have discussed these codes in detail and given several methods to work with the data and to apply the compressed codes to linear and predictive models. Risk adjustment is important in any investigation, and that involves the use of these codes. (Garrison, et al., 2002)

Health outcomes research remains in its infancy in terms of extracting meaningful long term results of the relationship of treatment choices to patient outcomes. With more knowledge of preprocessing and of exploratory techniques, such analyses can become commonplace. While there are many national databases available as we have shown in this book, some researchers are still reluctant to use them to study patient outcomes. (Harpe & Harpe, 2009) Yet, regardless of the accuracy of the research, the results will be used more often to make health care policy. (Doherty, et al., 2004)

Current Models in Health Outcomes Research

We look at some of the current models of health outcomes research. For example, a study of hand surgery outcomes suggested that much of the research is confined to testing new or existing surgical techniques and not looking at long term patient outcomes. (Chung, et al., 2006) This particular study was a meta-analysis of studies involving hand surgery. It did not use original data. A study on lung cancer outcomes was also conducted as a meta-analysis. (Earle & Earle, 2004)

In contrast, a study identified as outcomes research in head and neck cancer focused on reporting on the quality of life instruments. (Fung, Terrell, Fung, & Terrell, 2004) Other studies report on the quality of instruments as well, giving the impression that these instruments represent health outcomes research. (Patt, Mauerhan, Patt, & Mauerhan, 2005; Shimozuma, et al., 2007) Such studies generally imply that quality measures are the sole method of outcomes research.

Other studies examine the issue of what should be included in outcomes research. For example, a study reported, “The value of physiologic measures is questioned, whereas the importance of patient centered, economic, and traditionally accepted outcome measures is increasingly being recognized”, suggesting that outcomes research should be more patient centered. (Hanekom, et al., 2007) Another study suggests that there are three levels of outcomes research. (Karakiewicz, et al., 2006):

- Macro-level research targets cost and health care utilization, as well as racial, ethnic and geopolitical population health determinants.
- Meso-level studies address effectiveness, variability, disease impact, clinical modeling and program evaluation studies.
- Micro-level studies address all aspects of direct patient - clinician decision making.

The use of data mining techniques can be used to investigate all levels of outcomes. Other studies acknowledge these three levels as well. (Mark, et al., 1997; Stewart & Stewart, 2004) In particular, we can drill down to the micro level and examine the patient and clinician decision making.

To avoid the use of currently available databases, some propose that health outcomes involve large clinical trials. (Califf, et al., 2008;
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