Chapter 7
Risk Adjustment Based Upon Resource Utilization

INTRODUCTION

Resource utilization is based upon the assumption that patients with more severe problems will utilize more resources, and the most severe patients will require the most resources. This type of index assumes that no unnecessary resources are utilized and that treatments, medications, and laboratory diagnostics are required because of the severity of the patient condition. However, if the provider is extravagant in the use of resources, the patient will look severe. Then, too, some of the resources used will depend upon the admitting condition.

Suppose, for example, that a patient complains of chest pain. This could be a cold, asthma, acid reflux, or a heart attack. Without expending some resources for diagnostics, it would be impossible to find the actual patient condition. Again, a patient’s level of severity is defined using outcomes. Therefore, there will be some problem with validation. We can examine the issue of validation by comparing the index discussed here to the Charlson Index and the APRDRG.

There are three different resource demand indices provided with the National Inpatient Sample: for mortality, for length of stay, and for disease staging. We will examine all three to see how they are similar, and how they are different. This index is also proprietary and was developed by Thomson Medstat.

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Therefore, the exact methodology used to compute the indices is proprietary and unavailable for direct examination.

**BACKGROUND**

Studies that describe the relationship between healthcare utilization and patient condition and outcome are scarce. The Kessner Adequacy of Prenatal Care Index was developed to examine the relationship between prenatal care and birth outcomes. (Kotelchuck, 1994) It was regarded as flawed because of a heavy reliance on the timing of prenatal care. A second index was developed to overcome these problems. However, the timing of prenatal care was also used to develop this second index, although its importance was reduced.

Another study examined the relationship between compliance with medications and the need for additional resources such as emergency room visits. (Tu et al., 2005) This study suggested that patient compliance is an important factor in resource utilization, indicating that there may be problems with a reliance on such utilization to determine the difference in quality between providers. Patients with diabetes who routinely take their medication and test their blood sugar levels are compliant; patients who do not take their medication regularly enough are not. These patients who are not compliant may have more episodes of uncontrolled blood sugar that require emergency treatment.

A second study examined the relationship between patient body mass index (BMI) and resource utilization, with the result that patients with a BMI of 30 or greater had higher wound infection rates. (Thomas et al., 1997) This study used the following diseases as indicator variables in the regression model: degenerative joint disease, hypertension, cancer, coronary artery disease, peripheral vascular disease, diabetes, emphysema/asthma, congestive heart failure, stroke, liver disease, and renal failure. Note that while this list has some commonalities with the Charlson Index, there are differences. In particular, all of the co-morbidities are given equal weight, and there is no discussion of the validity of this list of co-morbid diseases, or justification as to why the BMI would be the ultimate marker for resource utilization.

Another study, for example, showed that two providers that treated patients with COPD had patients with very different characteristics. (Mapel et al., 2000) One provider has an average age that was approximately 7 years younger compared to the second provider and the patients had fewer co-morbidities. However, the resource utilization was very similar between the two groups, suggesting that the first provider was over-utilizing resources given its patient population.

**RESOURCES IN THE MEPS DATA**

The MEPS dataset contains very detailed information about reimbursements from payers, including payments by patients, insurers, and government agencies. Therefore, we can look at the relationship between actual reimbursements to patient condition. Moreover, the patient conditions are very detailed and include any ICD9 code that was used to diagnose a patient in the course of a one-year period. Therefore, we can examine actual resource utilization in relationship to patient diagnoses, to the other indices, and to primary and secondary procedures. We can also examine the resource utilization by state and federal governments, by private insurers, and by the patient.
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