

## **USING EPISODIC ANALYSIS TO EVALUATE THE COST AND QUALITY OF HEALTH CARE**

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### **ABSTRACT**

In recent years, health insurance companies have examined claims records in an attempt to identify treatment patterns and control the rising costs of medical care. This paper describes one method used to analyze claims data to understand the relationship between the cost for medical services and the quality of care. The system executes in base SAS software Version 6.07 in an MVS environment and uses several SAS statistical procedures to analyze costs by provider and facility type. The system is currently being used by the Episode of Care Project at Blue Cross Blue Shield of Florida.

### **INTRODUCTION**

Not long ago, privately insured patients could seek medical care under the guidance of their physician and remain largely unconcerned about the cost implications of the care they received. However, since the early 1980s, medical care inflation has outstripped economic inflation twice over. As a result, there is now a major initiative by the health care industry toward the better understanding and management of health benefit costs.

Because of the size, volume, the difficulty in defining quality and the complexity of health claims, there has been little definitive research that assessed the effect of alternative care options upon the quality of health care. In fact it is not clear if a close relationship

between cost and quality exists.

Using in-house claims data, the project team examined this relationship by analyzing an episode of a specific diagnosis; using specific treatment criteria. The team used four general applications: to analyze utilization patterns, to evaluate and manage networks, to evaluate programs, and identify areas for quality improvement.

### **METHODOLOGY**

The project's primary objective was to develop a methodology/template to evaluate programs and identify utilization and treatment patterns across product lines and regions.

Initially, using the criteria of high volume/high cost, the group selected Cholecystectomy as the first diagnosis to apply this methodology. Inpatient and outpatient claims incurred during 1991 were examined for specific diagnosis or procedure code related to gall bladder surgery.

Gall bladders are one of the more common complaints requiring surgery, especially in overweight women over 40-years old. Nevertheless, on average, a cholecystectomy (the surgical removal of the gall bladder) is more costly than other

surgical procedures. However, most are performed as elective surgeries. Patients may exhibit a long history of vague or specific complaints and undertake several types of non-invasive therapy before surgery is performed.

### WHAT IS AN EPISODE?

Health care differs from other goods and services purchased by consumers because it is typically provided in a series of separate, but related sessions or episodes. Moreover, health care service can include any number of components, such as physician office visits, prescription drugs, laboratory tests, radiologic procedures, surgical procedures and hospital services, over a period of long time.

For research purposes, it was decided that an episode would be defined by the admission to an acute care facility and/ or a surgical center for surgery. A unique logic key, containing the patient's contract number, sexual relationship and admission date, was built. The key was utilized to accumulate all related medical and pharmaceutical claims incurred seven days prior and 30 days after surgery in a mini-data base for analysis. Cases were grouped based on CPT-4 procedure codes for regular cholecystectomy and laparoscopic surgeries.

### THE SOURCE CODE

Our first challenge was to identify only those patients who had undergone the surgical removal of the gall bladder (Cholecystectomy). The claims files were searched for procedure codes indicating surgery was performed. The patient's contract number, dependent number, procedure code and date of surgery are read

into a dataset.

```
DATA CHOLY;
LENGTH CHOLYKEY $17;
INFILE PHYS;
INPUT @ X
      SUBSCRIB $9.  **Contract
      DEPENDT $2.  **Dependent
      PROCEDUR $5.  **Procedure
      SERVICDT $6.@; **Service date
```

```
SERVICE=
      INPUT(SERVICT,YMMDD6.);
```

```
IF PROCEDUR IN ('47600',..., '49311');
(physician surgical procedure codes (CPT)
for gall bladder surgery)
```

A key is established by concatenating the contract and dependent numbers (i.e. 123456789\*02).

```
CHOLYKEY=SUBS||'**|DEPENDT;
```

\*/A format library of the keys is created. By using a format library and a PUT statement, the large claims files can be accessed quickly and easily.

```
DATA _NULL;
SET CHOLY END=EOF;
FORMAT CHOLYKEY $17;
FILE FMTPROG;
IF _N_=1 THEN DO;
  PUT @1
"PROC FORMAT LIBRARY=SASLIB";
  PUT @1 'VALUE $EOCKEY ';
END;
```

```
CHOLYKEY=""||CHOLYKEY||"";
PUT @6 CHOLYKEY + 2 '=' + 2 "Y";
IF EOF THEN DO;
  PUT @6 'OTHER' = +2 "N"//;
END;
```

Using the "Cholykey" only the selected

patient's claims were extracted from the claims files.

```
DATA CLAIMS;
SET HISTORY; /*read claims files
BY SUBS;
INFILE CLMS;
/* extract only certain claims;
INPUT @ X
    SUBSCRIB $9. **Contract
    DEPENDT $2.@ **Dependent
CHOLYKEY=SUBSCRIB||'**DEPENDT;
IF PUT (CHOLYKEY, $EOCKEY.)='Y';
```

```
INPUT @ X
    BIRTH      $6. **Birth date
    PROCEDUR $5. **Procedure
    SERVFROM $6. **Service from
    SERVETO   $6. **Service to
    CHARGE    4.2 **Charged
    ALLOW     4.2 **Allowable
    PAID      4.2 **Paid amount;
    LOS       $2. **Location
    PROV      $5. **Provider
    PHYSPEC   $2. **Speciality
    DIAG 1    $5. **Diagnosis;
```

```
/*deletes substance abuse, psychiatry and
chiropractic claims;
IF PHYSPEC IN ('93','HE'..., 'SA')
THEN DELETE;
```

```
/*deletes substance abuse, psychiatry, and
chiropractic facility claims;
IF LOS IN ('C','E',..., 'H') THEN
DELETE;
```

```
DATA CHOLYCLM;
MERGE CHOLY(IN=A) CLAIMS(IN=B);
BY SUBSCRIB DEPENDT;
IF A;
IF BIRTH NE ' ' THEN DO;
    DAY=TODAY0;
    BDT=INPUT(BIRTH,YYMMDD6.);
    AGE=INT((DAY-BDT)/365.25);
```

```
IF AGE LT 0 THEN AGE=AGE+100;
END;
```

```
SERVDATE=
    INPUT(SERVFROM,YYMMDD8.);
DROP BDT DAY;
```

```
**Creates a unique number for each case;
```

```
IF FIRST.DEPENDT THEN
CHOLYID+1;
```

```
/*Sorts and deletes any claims not within
the boundaries of episode (seven days
before and thirty days after);
```

```
PROC SORT DATA=CHOLYCLM;
BY SUBSCRIB DEPENDT;
WHERE SERVDATE BETWEEN
    (SERVICE-7) AND (SERVICE+30);
```

```
DATA CHOLYS;
SET CHOLYCLM;
BY SUBSCRIB DEPENDT;
IF FIRST.DEPENDT THEN DO;
```

```
    HOSP=0;
    DCTR=0;
    ASC=0;
    LAB=0;
    AMBUL=0;
    DRUGS=0;
    TOTAL=0;
```

```
END;
SELECT(LOS);
WHEN (' ') DRUGS+PAID;
WHEN ('A') LAB+PAID;
WHEN ('B') ASC+PAID;
WHEN ('1') DO;
```

```
    IF PHYSPEC NE H1 THEN DO;
    IF SUBSTR(PROV,1,1)='A' THEN
        AMBUL+PAID;
    ELSE IF SUBSTR(PROV,1,1)='L'
        THEN LAB+PAID;
    ELSE HOSP+PAID;
```

```
END;
WHEN ('3') DO;
```

```

IF SUBSTR(PROV,1,1)='L'
  THEN LAB+PAID;
ELSE IF SUBSTR(PROV,1,1)='W'
  THEN DRUGS+PAID;
ELSE DCTR+PAID;
END;
END;
IF LAST CHOLYID THEN DO;
  TOTAL=SUM(ASC,HOSP,DCTR...;
OUTPUT;
END;

```

### STATISTICAL ANALYSIS

By using SAS statistical procedures and indepth analysis of the data, we can provide some information on the progression and cost of medical care.

The primary role of the claims record is as a history of a transaction, the payment for health services. However, since the claim record is often the most accessible to insurance companies, they generally are the primary data source identified for research.

While the claim record can provide information about the payment of covered services, it does not afford the necessary data on clinical diagnosis and quality indicators. However, there are certain variables, such number of inpatient days, returns to surgery, use of certain drugs to combat infection can be identified as areas for improvement of the overall efficiencies and quality of health care. Moreover, the episode approach can suggest the most productive areas for exploring potential cost-containment programs.

Statistical procedures can provide an analytical framework for a fact-based approach to comparing and evaluating providers. The project used PROC MEANS to calculate the average costs by provider and

facility.

```

PROC MEANS DATA=CHOLYS;
VAR AGE HOSP DCTR TOTAL;

```

The same process was utilized, except allowable charges for services were used instead of paid amounts.

### CONCLUSIONS

There are several elements of this research which were acknowledged but were not dealt with in the initial phases. We recognized that all cases are not equal; age and sex adjustments of data should be made; and cases were not weighted based on region.

Today's dynamic health care environment necessitates and increasing emphasis on better management of health care costs and outcomes. There have been many studies which have focused on cost containment strategies. However, few studies have attempted to examine the cost effectiveness of care and its relationship to quality care. This project has established an initial methodology which can look across product lines and acknowledge the service linkages within episodes of care.