Written Technical Report for Group Data 5

The data set in which this report is based on is from the Group 5 Data file. This data file contains several MS-DRGs. The first DRG code is 682, which is for Renal Failure. Another DRG code that is contained in the data set is 683, which is Acute lymphadenitis. The last DRG code that was identified is 684, which represents Impetigo. There are three total providers contained in this data set; A, B, and C. There are 192 patients for provider A, 55 patients for Provider B, and 79 patients for Provider C for a total of 325 patients in the data set.

MedPAR is The Medicare Provider and Analysis Review. The file contains inpatient final action stay records for patients who receive Medicare benefits. MedPAR files contain several bits of information such as; procedures, diagnoses or DRG codes, length of stay, and Medicare payment amounts. The data set that is the basis of this technical report contains the following variables coded: age, sex, provider, length of stay, reimbursement amount, total accommodations charges, total departmental charges, total charges, number of diagnosis codes, number of procedure codes, admission source, discharge destination, and drg code. For this report, a simple linear regression will be utilized to show the correlation between an independent and dependent variable, in which the strength and direction of the relationship is measured. A linear regression analysis will be performed on coded variables “sex” and “LOS”.

(See next page)

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Linear Regression** | | | | | | | |
|  |  |  |  |  |  |  |  |
| **Regression Statistics** |  |  |  |  |  |  |  |
| *R* | 0.07157 |  |  |  |  |  |  |
| *R Square* | 0.00512 |  |  |  |  |  | Y=1.4568 + 0.0041X |
| *Adjusted R Square* | 0.00204 |  |  |  |  |  |  |
| *S* | 0.495 |  |  |  |  |  |  |
| *Total number of observations* | 325 |  |  |  |  |  |  |
| **Sex = 1.4568 - 0.0041 \* LOS** | | | | | | | |
|  |  |  |  |  |  |  |  |
| **ANOVA** |  |  |  |  |  |  |  |
|  | *d.f.* | *SS* | *MS* | *F* | *p-level* |  |  |
| *Regression* | 1. | 0.40748 | 0.40748 | 1.66301 | 0.19812 |  |  |
| *Residual* | 323. | 79.14329 | 0.24503 |  |  |  |  |
| *Total* | 324. | 79.55077 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *LCL* | *UCL* | *t Stat* | *p-level* | *H0 (2%) rejected?* |
| **Intercept** | 1.4568 | 0.03554 | 1.3737 | 1.5399 | 40.98655 | 0.E+0 | *Yes* |
| **LOS** | -0.00409 | 0.00317 | -0.0115 | 0.00332 | -1.28958 | 0.19812 | *No* |
| *T (2%)* | 2.33795 |  |  |  |  |  |  |
| *LCL - Lower value of a reliable interval (LCL)* | | | |  |  |  |  |
| *UCL - Upper value of a reliable interval (UCL)* | | | |  |  |  |  |

Based on the results of the linear regression between “sex” and “LOS”, the “R” value of 0.0715, the correlation between sex and LOS is very minimal at about 7%. Only about .005% of LOS is related to the sex of patients. Below is a linear regression line graph showing that there is NO correlation between variables “age” and “LOS” for the first 20 patients in the data set, much like “sex” and “LOS”.

The next analysis that was run was the descriptive statistics function in excel. This analysis was run on Group data 5 and Group data 6 as method of comparison between the two data sets on Length of Stay or LOS. Group Data 5’s results showed an average or mean of 7.12 for the length of stay in the hospital. Group Data 6 showed a mean of 5.5 length of stay in their hospital. Both Group data had a minimum LOS of 1 day. Group 5 had a significantly higher maximum LOS of 83 than Group 6’s 37. Group 6 DRG codes 242, 243, and 245 are all related to one another in which they stand for “Permanent cardiac pacemaker implant with MCC, with CC, and without MCC/CC.” I would assume a DRG code 682, which is Renal Failure, correlates with a longer LOS. The descriptive statistics data for both group data sets is shown below:

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| --- | --- | --- | --- |
| *Alpha value (for confidence interval)* | 0.02 |  |  |
| **Group Data 5 (LOS)** | | | |
| *Count* | 325 | *Skewness* | 4.97245 |
| *Mean* | 7.12 | *Skewness Standard Error* | 0.13483 |
| *Mean LCL* | 5.99496 | *Kurtosis* | 35.80916 |
| *Mean UCL* | 8.24504 | *Kurtosis Standard Error* | 0.2672 |
| *Variance* | 75.26025 | *Alternative Skewness (Fisher's)* | 4.99553 |
| *Standard Deviation* | 8.67527 | *Alternative Kurtosis (Fisher's)* | 33.33825 |
| *Mean Standard Error* | 0.48122 | *Coefficient of Variation* | 1.21844 |
| *Minimum* | 1. | *Mean Deviation* | 4.70105 |
| *Maximum* | 83. | *Second Moment* | 75.02868 |
| *Range* | 82. | *Third Moment* | 3,231.55103 |
| *Sum* | 2,314. | *Fourth Moment* | 201,580.56667 |
| *Sum Standard Error* | 156.39559 | *Median* | 5. |
| *Total Sum Squares* | 40,860. | *Median Error* | 0.03345 |
| *Adjusted Sum Squares* | 24,384.32 | *Percentile 25% (Q1)* | 3. |
| *Geometric Mean* | 4.95647 | *Percentile 75% (Q2)* | 8. |
| *Harmonic Mean* | 3.69699 | *IQR* | 5. |
| *Mode* | 2. | *MAD* | 2. |

|  |  |  |  |
| --- | --- | --- | --- |
| *Alpha value (for confidence interval)* | 0.02 |  |  |
| **Variable #1 (LOS)** | | | |
| *Count* | 251 | *Skewness* | 2.19846 |
| *Mean* | 5.55777 | *Skewness Standard Error* | 0.15308 |
| *Mean LCL* | 4.80526 | *Kurtosis* | 10.36123 |
| *Mean UCL* | 6.31028 | *Kurtosis Standard Error* | 0.30255 |
| *Variance* | 25.92765 | *Alternative Skewness (Fisher's)* | 2.2117 |
| *Standard Deviation* | 5.09192 | *Alternative Kurtosis (Fisher's)* | 7.53429 |
| *Mean Standard Error* | 0.3214 | *Coefficient of Variation* | 0.91618 |
| *Minimum* | 1. | *Mean Deviation* | 3.70972 |
| *Maximum* | 37. | *Second Moment* | 25.82435 |
| *Range* | 36. | *Third Moment* | 288.51083 |
| *Sum* | 1,395. | *Fourth Moment* | 6,909.87357 |
| *Sum Standard Error* | 80.67118 | *Median* | 4. |
| *Total Sum Squares* | 14,235. | *Median Error* | 0.02543 |
| *Adjusted Sum Squares* | 6,481.91235 | *Percentile 25% (Q1)* | 2. |
| *Geometric Mean* | 3.84845 | *Percentile 75% (Q2)* | 8. |
| *Harmonic Mean* | 2.67611 | *IQR* | 6. |
| *Mode* | 1. | *MAD* | 2. |

The final analysis that I performed was a Case Mix Analysis to find the average MS-DRG weight for patients in hospital group 5 and hospital group 6. The analysis’ results show that group 5 hospital has a Case Mix Index of .974 and group 6 with a CMI of 2.724. Based on these findings, I can conclude that hospital group 6 is significantly performing at a higher financial level than my client group data 5. A high CMI indicates that the hospital performs many expensive or high cost services to their patients, which indicates that the hospital receives more money per patient.

Group 5 CMI:

|  |  |  |  |
| --- | --- | --- | --- |
| **MSG-DRG** | **# of cases** | **Relative weight** | **Total relative weight** |
| 682 | 120 | 1.5401 | 184.812 |
| 683 | 173 | 0.9282 | 160.579 |
| 684 | 32 | 0.6213 | 19.882 |
| totals | 375 |  | 365.273 |
|  |  |  | CMI = .974 |

Group 6 CMI

|  |  |  |  |
| --- | --- | --- | --- |
| **MSG-DRG** | **# of cases** | **Relative weight** | **Total relative weight** |
| 242 | 61 | 3.7491 | 228.695 |
| 243 | 87 | 2.6716 | 232.429 |
| 244 | 103 | 2.1608 | 222.562 |
| totals | 251 |  | 683.686 |
|  |  |  | CMI = 2.724 |

The differences in CMI probably have to do with the MS-DRG codes in which the two hospitals contain vary different ones. DRG 252-244 in group data 6 is a procedure that requires a permanent pacemaker to be inserted into a patient. “A pacemaker is an electronic device, approximately the size of a pocket watch, that senses intrinsic heart rhythms and provides electrical stimulation when indicated” (Yarlagadda, 2014). According to medicarehelp.org, the average cost for an implant in California was $61,764. When comparison to Renal failure, or DRG 682 from group data 5, the cost of dialysis treatment is about $114 per day. The typical amount of treatment per week is about 3 times, which equates to about $17,784. As you can see here, the two DRGs have significant differences in costs, which indicates the group 5 hospital services are bringing down it’s Case Mix Index.

Based on my findings, my client hospital group 5 will need to shorten the average length of stay of their patients based on the descriptive statistic analysis. The LOS can be reduced through creating more specialty treatments outside of Renal failure, that might have a quicker recovery period. This also coincides with the Case Mix Index study showing a low CMI for my client. The CMI can be increased with additional specialty services that will allow more funds allocated per patient in the hospital from Medicare.

Reference:

How Much Does Dialysis Cost? - CostHelper.com. (n.d.). Retrieved December 15, 2014, from <http://health.costhelper.com/dialysis.html>

The price of a Permanent Cardiac Pacemaker Implant No Complications. (n.d.). Retrieved December 15, 2014, from <http://www.medicarehelp.org/cost-of-medicare/procedure/permanent-cardiac-pacemaker-implant-no-complications>

Yarlagadda, C. (n.d.). Permanent Pacemaker Insertion . Retrieved December 15, 2014, from <http://emedicine.medscape.com/article/1839735-overview>