E/M Utilization Distribution Study

Calendar years 2003 through 2007

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Introduction

Each year, CMS comes out (along with other sources) reporting on the changes to the use and utilization of E/M codes for physicians. Quite often, the results of these studies are not accurately reported as the studies themselves have flaws that bias the distribution changes from period to period. In this study, I attempted to deal with those biases and present a more accurate picture of utilization shifting within the major E/M code categories for different specialties of physicians.

Methodology

Several studies I have seen measure the total volume of codes reported in order to understand usage patterns. This method introduces significant flaws as it rarely relates back to reasons for volumetric variability other than physician behavior. Yet we see that changes in Medicare enrollment, providers accepting Medicare patients and alternate programs for the elderly that do not report back to the P/SPS file can have a significant effect on the interpretation of the results. Some studies also use RVU values as a proxy for volume, yet, as RVU values also change from year to year, it biases the results due to variability that has nothing (or little) to do with actual changes in coding behavior or preferences.

In order to eliminate these biases, I have utilized a methodology that (hopefully) will normalize the data to prevent this type of creep into the study. The first step was to identify the categories to be studied. Of the 2.5 billion claim lines submitted to Medicare for CY 2007, 15.8% were reported as E/M codes (99201 through 99499). Of these, 90% were made up of office visit, hospital visit, consulting and emergency department codes. Therefore, I chose to use new and established office visits, initial and established hospital visits, initial/outpatient consults and inpatient consults as well as the emergency department visit codes. In all, these accounted for 386,458,282 claim lines.

Rather than look at changes in volume, I chose to develop a pure frequency distribution calculation. In this way, changes in volume due to any reason could be controlled. Using a distribution model, I calculated the utilization of a particular code within its associated code group only. So, for example, I calculated the utilization of each of the new office visits codes (99201 – 99205) as a percent of all new office visit codes, making the results relatively agnostic to total volume. This calculation was conducted for each of the code categories for each year, 2003 through 2007. One problem with this method has to do with the ability to report shifting using graphics without having an overwhelming number of graphs

and charts to compare. We are looking at 54 specialties, five coding categories and in total, 31 codes, which would end up requiring in excess of 1,500 charts and/or graphs to clearly understand the extensiveness of the results.

To avoid this, I decided to create a single value that could be used to represent shifting within a single code group; a value that would measure both direction and magnitude of change from year to year. The calculation is dependent on the proportion distributions and therefore was relatively easy to construct. Initially, I used the total RVUs reported for each code, proportionally distributed these based on the prior frequency distribution calculations and came up with a single value that represented, in essence, the mean RVU for that category. This value, alone, didn't mean much but when compared from period to period, gave a good sense of the velocity of change. When I tested this using neutral distributions across periods, I ran into a problem due to changes in the RVU values. This resulted in year-to-year shifting even when the distributions remained the same. To deal with this, I calculated the average RVU for each code for the four year period and the Fully Implemented value (effective 2010) and applied that to the entire study. Then, in order to get a better handle on magnitude, I ranked each of these within the categories such that the middle code for each category had a value of one (1) and each of the other codes was proportionally measured against that middle value. For example, the following represents the average RVU for each new office visit code for the four-year study period:

- 99201 1.05
- 99202 1.83
- 99203 2.68
- 99204 4.03
- 99205 5.09

Setting the middle code equal to 1 and factoring the others, we get a magnitude ranking as follows:

- 99201 0.393
- 99202 0.685
- 99203 1.000
- 99204 1.503
- 99205 1.899

By constructing the model in this way, I can easily see the magnitude differences between each code and therefore refer to these metrics simply as differentials. For example, in the above table, I can see that the 99202 code has a value that is approximately 68.5% of the 99203 code while the 99204 code has a value that is approximately 150% of the 99203 code. For all code groups, these values were normally distributed. In the above group, for example, the AD value was 0.177 with a p-value of .838.

The next step was to build a series of tables using the distribution data for each year and create a link to the differential values and then simply compare the shift between each value by category. Calculations were conducted for 54 specialties, including some non-physician providers, such as NPs and PAs. Comparisons were conducted year to year between 2003 and 2007 with a single comparison of 2003 to

2007. Shift was measured as variance by dividing the former year by the prior and then subtracting 1. All values are shown as percents.

Interpretation of the Results

Because we use values that represent velocity (magnitude and direction), interpreting the results is a matter of understanding the relationship between these two variables. For example, the higher average differential value for a category, the greater the shift to the right of use of the higher level codes. You can easily prove this by changing the frequency distribution of any code within a given category. For example, if I were to increase the percent distribution of 99204 or 99205 codes with a subsequent decrease in the utilization distribution of codes 99201 or 99202, the differential value would be higher as the individual value for the codes increases within the category. Therefore, variance is used to interpret the direction and magnitude of shifting within each category.

The following example shows the shift for new office visit codes for general surgery:

- 2003 to 2004 4.04%
- 2004 to 2005 0.15%
- 2005 – 2006 -0.023%
- 2006 – 2007 8.55%
- 2003 – 2007 12.87%

In this example, we see that the differential value for new office visits increased by 4.04% Be careful not to relate this to volume as it is based on 'within' frequency distribution calculations. This means that, between 2003 and 2004, irrespective of the volume of new office visit codes reported, there was a 4.04% shift to using higher level codes within that specific category. Overall, between 2003 and 2007, general surgeons reported a shift of 12.87% to higher individual new office visit codes. Remember, this does not mean that they did more (higher volume) of any particular code but rather more of a particular code in relation to others within the category. In fact, it is possible that there was a reduction in volume overall yet the frequency distribution of the code set still shifted higher.

The tables can be sorted by category by year to get a better perspective on spread between specialties. For example, a descending sort on the 2007 to 2003 column for new office visits show that radiology experienced the greatest shift to higher codes with a variance of 84.72% while medical oncology showed a the highest shift to lower codes with a variance of -45.61%. For codes 99241 to 99245 (outpatient consults) pathology showed the highest right-shift with a variance of 81.14% while rheumatology showed the highest left-shift with a variance of -47.67%.

To get a copy of the worksheet with the results of the study, go to www.mitsi.org and click on the Download tab. Comments and questions can be directed to me at frank@mitsi.org.