ICD-10 Coding Productivity Study Highlights Emerging Standards

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The implementation of ICD-10 has been compared to Y2K, with industry analysts noting that October 1, 2015 came and went with little fanfare. This commentary speaks volumes to the significant preparation that occurred in the months and years leading up to ICD-10. If you were in the trenches for this adaptive challenge, the ICD-10 go-live—while smooth by all accounts—was anything but a non-event.

The successful transition occurred long before the go-live date and required information systems updates, education and training, testing, and a considerable amount of cooperation and collaboration. Industry anxiety was rampant in the months leading up to the transition, with predictions of dire coding productivity decline and an increased coding professional shortage as well as concerns about a negative impact to revenue and cash flow. Many of the grim predictions have not panned out as the industry settles in to a new normal when it comes to coding productivity and staffing.

To quantify the impact of ICD-10 on coding productivity, CIOX Health, in partnership with the University of Pittsburgh, Department of Health Information Management, School of Health and Rehabilitation Sciences, conducted an ICD-10 coding productivity research study and examined average inpatient coding times using a total of 157,248 records. All records were from discharges of October 1, 2015 through February 29, 2016. Average coding time across DRG, principal diagnosis, and length of stay (LOS) as well as stratification by facility based on demographic variables such as case mix index (CMI), bed size, region, teaching or non-teaching, and trauma level were also examined. Most of the healthcare facilities within this study were large—teaching and trauma facilities with more than 500 beds and a CMI of less than 1.5.

Coding Professional Demographics, Coding Process

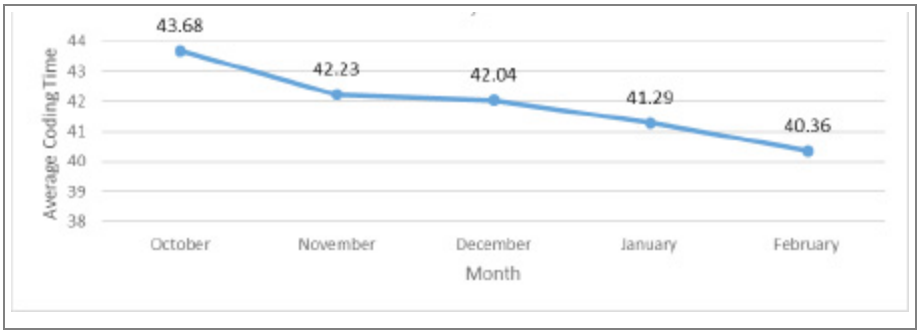
Coding professional demographics were collected as part of the study and included credential, training, and previous ICD-10 coding experience. The majority of coding professionals in the study have a CCS credential, performed dual coding, and were employed full time. All of the coding professionals have previous inpatient coding experience and 80 percent had more than 60 hours of ICD-10 training. Coding productivity times were calculated automatically during the coding process by the CIOX Health coding system.

As part of the coding process, coding professionals used common industry encoders 100 percent of the time (80 percent logic-based; 20 percent book-based) and used computer-assisted coding 24 percent of the time. Electronic health records were used in the coding process 53 percent of the time and a hybrid record 47 percent of the time. The amount of time that most coding professionals spent doing activities other than coding, such as abstraction, was in the range of one to 15 minutes per hour.

Coding Productivity Observations

As expected, improvements were seen in ICD-10 coding productivity over the five-month period. Average coding time per record in October 2015 was 43.7 minutes (1.4 records per hour or 11 records per day, where a day is equal to eight hours), and by February 2016 the average coding time per record decreased to 40.4 minutes (1.5 records per hour or 11.9 records per day), an average increase of almost one record per day over the five-month period (Figure 1 below).

Figure 1: Average Coding Time (in minutes) by Month (ICD-10, 2015-2016)



After examining average coding time by month, the average coding productivity was compared to an ICD-9 dataset of 84,627 records from CIOX Health from the time of May 1, 2015 to September 30, 2015 and to the AHIMA standard established in AHIMA's 2007 Coding Benchmark Survey. ICD-10 coding productivity decreased approximately 20 percent when compared with the CIOX Health ICD-9 dataset, and the study confirms the general overall hit to productivity experienced during the transition to ICD-10 across the country (see Table 1 below). Coding productivity decreased about 50 percent compared to the AHIMA ICD-9 standard established in 2007.

Table 1: Comparing Standard Coding Productivity Times

Inpatient Coding	**ICD-9 2007 Sample AHIMA**	**ICD-9 Sample of Average Coding Times: May-Sept. 2015 CIOX Health N = 84,627**	**ICD-10 Sample of Average Coding Times: Oct.-Feb. 2016 CIOX Health N = 157,248**
Records/day	24	14.0	11.5
Records/hour	3	1.8	1.4
Average time per record	20 minutes	34.2 minutes	41.9 minutes

Coding Productivity by Case Mix Index (CMI)

Coding productivity by CMI was examined based on low (<1.5), moderate (1.5-1.8), and high (>1.8) CMI categories. A comparison of CMI levels and average coding times is noted in Table 2 below and shows that coding productivity (minutes per record) for high CMI facilities was approximately 30 percent longer than low CMI facilities.

Table 2: Coding Productivity by Case Mix Category

	Low CMI <1.5 n=71,443	**Moderate CMI 1.5 - 1.8 n=60,484**	**High CMI > 1.8 n=25,321**
Records/day	12.6	11.5	9.0
Records/hour	1.6	1.4	1.1
Average completion time (minutes per record)	38.0	41.6	53.6

Coding Times for Most Frequent DRGs

The average coding times for those cases that fell into the top 25 DRGs within the CIOX Health ICD-10 dataset were explored. These DRGs were very similar to the current (2013) CMS Inpatient Charge Dataset. DRG 871, Septicemia or Severe Sepsis without mechanical ventilation (MV) 96+ hours with major complicating or comorbid condition (MCC) had the

highest average coding time with 50.58 minutes for those cases that were in the top 25 DRGs of the dataset. The second highest was 682, Renal Failure with MCC with 50.57 minutes. There were also several other DRGs in the top 25 that took over 40 minutes (see Table 3 below).

Table 3: Highest Average Coding Times within the Top 25 DRGs in the CIOX Health ICD-10 Dataset

DRG Number, Title, and Sample Size	Average Coding Time (Minutes)
871, Septicemia or Severe Sepsis without mechanical ventilation (MV) 96+ hours with major complicating or comorbid condition (MCC) n=5,805	50.58
682, Renal Failure with MCC n= 1,260	50.57
291, Heart Failure and Shock with MCC n= 2,031	45.95
189, Pulmonary Edema and Respiratory Failure n=1,610	43.84
378, Gastrointestinal (G.I.) Hemorrhage with CC n = 1,407	43.55
193, Simple Pneumonia and Pleurisy with MCC n = 1,338	42.56
683, Renal Failure with complicating or comorbid condition (CC) n= 1,488	40.93
190, Chronic Obstructive Pulmonary Disease (COPD) with MCC n= 1,316	40.76
65, Intracranial Hemorrhage or cerebral infarction with CC OR TPA in 24 hours n=1,369	40.35
872, Septicemia or Severe Sepsis without MV 96+ hours without MCC n=2,285	40.27

Coding Times for Less Frequent DRGs

The researchers were also interested in understanding how long it took to code certain less frequent DRGs. These DRGs were observed to have long completion times of over two hours. But this is believed to be due to the complexity intrinsic to these chart types, as opposed to an ICD-10-specific change. It was useful to examine coding times on less frequent DRGs since productivity can be impacted more so by these DRGs.

Less frequent DRGs (that took over two hours to code) included:

- DRG 003, ECMO or Trach with MV >96 hours or PDX EXC Face, Mouth & Neck with Major O.R. which also had a principal diagnosis of A41.9- Sepsis, unspecified organism
- DRG 004, Trach with MV >96 hours or PDX EXC Face, Mouth & Neck without Major O.R. and a principal diagnosis of A41.9- Sepsis, unspecified organism
- DRG 453, Combined Anterior/Posterior Spinal Fusion with MCC and a principal diagnosis of M48.06- Spinal stenosis, lumbar region

AHIMA Also Conducts Coding Productivity Study

Another coding survey conducted by AHIMA and the AHIMA Foundation in June found that the transition to ICD-10 on October 1, 2015 had virtually no effect on coding accuracy—just 0.65 percent. In addition, the study participants' perceived an average productivity decline of 14 percent. This represents a lower decline than most in the healthcare industry expected, said AHIMA CEO Lynne Thomas Gordon. Many survey respondents noted that the implementation of new computer-assisted coding (CAC) technology occurred at the same time as the introduction of the ICD-10 code set. This may account for some portion of the productivity decline.

It should be noted that AHIMA's study was a qualitative study based on participants' perceived impact of the ICD-10 implementation on coding productivity and accuracy. A random sample of 400 individuals listing "coding professional" or a related title in their AHIMA member profile and also holding at minimum a CCS, CCS-P, or CCA certification was selected from the AHIMA member database for the study. A total of 156 individuals in both inpatient and outpatient coding fields actually participated in the study.

Productivity was affected in all respondent groups, regardless of educational level or experience. HIM professionals who worked in inpatient settings had less of a productivity decline than those who worked in outpatient settings. AHIMA and the AHIMA Foundation plan to conduct another survey in May 2017 to determine trends in productivity and accuracy.

To read the full study, visit www.ahimafoundation.org/research/codingproductivity.aspx.

Final Comments and Recommendations

This study establishes a quantifiable, emerging coding productivity standard for ICD-10-CM/PCS. The study validates industry anecdotal and experiential information with quantifiable data of a large sample of over 157,000 records. This data sample establishes that by this point in the ICD-10 implementation, productivity should be nearing at least 11.5 inpatient records coded per day, 1.4 records per hour, taking approximately 42 minutes per inpatient record.

The authors recommend that all healthcare facilities take steps now to examine their records using a similar data analytics process. Knowing which DRGs and diagnoses take the longest time to code and are the most frequent in the patient population will enable coding supervisors to know where to educate and train their coders.

Productivity is just one part of coding. Coding accuracy should also be measured. In the next coding research study set to be released in early 2017, the authors will assess coding accuracy and coding productivity to date, and combine the results to establish coding standards that may be used across the coding industry.

Reference

DeVault, Kathryn. "Best Practices for Coding Productivity: Assessing Productivity in ICD-9 to Prepare for ICD-10." *Journal of AHIMA* 83, no. 7 (July 2012): 72-74.

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