

The Impact of the ICD-9-CM to ICD-10-CM Conversion to Identify Chronic Conditions in Administrative Claims

Rachel VanGilder¹, Ph.D., Kathy Schneider², Ph.D., Brandon Jeffrey³, Ph.D., Aaron O'Donnell¹, B. A., Tena Zingerman³, RHIT, Dan Parks¹, M.S., and Michelle Seal⁴, B.S.

¹ NewWave Telecom & Technologies, Inc. ² Schneider Research Associates, LLC. ³ General Dynamics Health Solutions ⁴ Centers for Medicare & Medicaid Services

INTRODUCTION

On October 1, 2015 the conversion from the 9th version of the International Classification of Diseases (ICD-9-CM) to version 10 (ICD-10-CM) occurred. The ICD-10-CM has more than 70,000 unique codes compared to approximately 14,000 ICD-9-CM codes, which allows for more detail surrounding diagnoses.

The General Equivalence Mappings (GEM) were created by the Centers for Medicare & Medicaid Services (CMS) and the Centers for Disease Control and Prevention (CDC) to guide the forward and backward mappings between ICD-9-CM and ICD-10-CM. The mappings between versions allowed linking a ICD-9-CM diagnosis to an ICD-10-CM diagnosis, however often there are many ICD-10-CM diagnosis codes associated with a single ICD-9-CM diagnosis code, and instances where a single ICD-10-CM diagnosis code is associated with multiple ICD-9-CM diagnosis codes.

The Health Insurance Portability and Accountability Act (HIPAA) electronic administrative transactions standards, Version 5010, required that all services provided on or after October 1, 2015 utilize ICD-10-CM codes. Regardless of when a claim was submitted for payment, services that occurred prior to October 1, 2015, were able to use ICD-9-CM codes.

The Chronic Condition Warehouse (CCW) developed algorithms to identify 27 chronic conditions using administrative claims data. The algorithms used to identify these claims were updated to include the new ICD-10-CM codes in 2015. We used Medicare claims in the CCW to examine the implications of the conversion to the ICD-10-CM on statistics related to disease prevalence.

The objectives of this study are to: 1) validate that Medicare claims were received in the CCW after the ICD-10-CM conversion without disruption; 2) describe the changes in the CCW algorithms to identify three chronic conditions (Acute Myocardial Infarction [AMI], Asthma and Hip/Pelvic Fractures); and 3) quantify the impact on the prevalence rates of these conditions after the conversion to ICD-10-CM codes.

METHODS

Study Design: Under contract with CMS, NewWave Telecom and Technologies – General Dynamics IT joint venture receives Medicare claim data files which are processed by CMS and are loaded to the CCW database. To validate the conversion to ICD-10-CM, Part A (inpatient [IP], skilled nursing facility [SNF], hospice [HOS], home health [HH], hospital outpatient [HOP]) and Part B claims (carrier and durable medical equipment [DME]) for services ending on or after October 1, 2015 were examined. The number of claims processed by month for the last four months of 2014 and 2015 were compared to determine the impact of the new coding system on claims volume.

The algorithms developed by the CCW to identify chronic conditions were mapped from ICD-9-CM to ICD-10-CM using the GEMS and validated through the ICD-10-CM codebook. We examined the prevalence of AMI, Asthma and Hip/Pelvic Fractures in fee-for-service Medicare beneficiaries in 2015, which consisted of ICD-9-CM for ¾ of the year and the ICD-10-CM codes the remainder of the year. For comparison, we extracted claims for these conditions in 2013 and 2014 using the same level of maturity; that is, we allowed for the claims to be updated and reconciled through the first quarter of the following year (e.g., the 2014 claims were processed through the end of March 2015). We compared the 2015 prevalence rates to 2014 and 2013 rates which used only ICD-9-CM diagnosis codes.

Population: We used 100% Medicare fee-for-service claims for services in 2013 through 2015.

Table 1. Number of claims received September through December by setting in 2014 and 2015.

Month-Year	Sep-14	Sep-15	Oct-14	Oct-15	Nov-14	Nov-15	Dec-14	Dec-15
IP/SNF/HOS	1,606,572	1,605,502	1,901,920	1,862,882	1,600,259	1,574,732	1,611,278	1,600,797
OP / HH	13,588,461	13,675,502	17,350,797	17,117,177	13,704,669	13,857,689	13,477,355	13,795,419
Carrier	67,972,449	67,795,009	92,122,708	90,071,838	70,064,984	70,636,923	68,192,863	69,078,118
DME	4,928,505	4,787,997	6,337,499	6,139,552	4,672,570	4,570,567	4,843,684	4,905,904

RESULTS

We found no disruption in the receipt of claims after the implementation to ICD-10-CM (Table 1). The CCW continued to receive claims weekly after the transition from ICD-9-CM to ICD-10-CM. Examination of the number of IP, SNF and HOS claims found 2% fewer claims received in the first month after the implementation of ICD-10 than the same time period in 2014. By December 2015, the number of claims obtained was less than 1% different between 2014 and 2015.

Among OP and HH claims, slightly fewer claims (~1.4%) were received in the first month after ICD-10-CM implementation. By November and December of 2015, more OP and HH claims were received compared to 2014. A similar trend was found in carrier claims. Fewer carrier claims were received in October 2015 compared to 2014 (~2.2%) however this trend reversed itself in November and December.

The number of DME claims that were received in October and November 2015 were slightly lower than in 2014. However, in December 2015, more DME claims were received than in 2014.

Table 2. ICD-9-CM and ICD-10-CM codes associated with AMI, Asthma and Hip/Pelvic Fractures

Condition	ICD-9-CM codes	ICD-10-CM codes
AMI	410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, 410.91	I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I22.0, I22.1, I22.2, I22.8, I22.9
Asthma	493.00, 493.01, 493.02, 493.10, 493.11, 493.12, 493.20, 493.21, 493.22, 493.81, 493.82, 493.90, 493.91, 493.92	J44.0, J44.1, J44.9, J45.20, J45.21, J45.22, J45.30, J45.31, J45.32, J45.40, J45.41, J45.42, J45.50, J45.51, J45.52, J45.901, J45.902, J45.909, J45.990, J45.991, J45.998
Hip/Pelvic Fracture	733.14, 733.15, 733.96, 733.97, 733.98	M80.051A, M80.052A, M80.059A, M80.851A, M80.852A, M80.859A, M84.350A, M84.351A, M84.352A, M84.353A, M84.359A, M84.451A, M84.452A, M84.453A, M84.459A, M84.551A, M84.552A, M84.553A, M84.559A, M84.651A, M84.652A, M84.653A, M84.659A, 808.0, 808.1, 808.2, 808.3, 808.41, 808.42, 808.43, 808.44, 808.49, 808.51, 808.52, 808.53, 808.54, 808.59, 808.8, 808.9, 820.00, 820.01, 820.02, 820.03, 820.09, 820.10, 820.11, 820.12, 820.13, 820.19, 820.20, 820.21, 820.22, 820.30, 820.31, 820.32, 820.8, 820.9

The number of diagnosis codes associated with these conditions increased with ICD-10-CM (Table 2). For AMI, there were ten ICD-9-CM codes compared to 14 ICD-10-CM codes. For asthma, there were 14 ICD-9-CM codes compared to 21 ICD-10-CM diagnosis codes. Previously, hip/pelvic fractures were identified using 39 ICD-9-CM codes compared to 423 unique codes with ICD-10-CM.

To determine whether the prevalence of three conditions was impacted by the conversion to ICD-10, we calculated the prevalence rates of AMI, asthma, and hip/pelvic fracture for the Medicare fee-for-service enrolled population for the most recent three years, using the same level of claim maturity.

The prevalence rates for AMI and hip/pelvic fracture were stable in 2015 compared to 2013 and 2014 (Table 3). However, an increased prevalence of 17% was noted in asthma between 2014 and 2015. Examination of the ICD-10-CM diagnosis codes used for asthma indicated that a number of Chronic Obstructive Pulmonary Disease (COPD) codes were added, in accordance with GEM mapping. To ascertain whether the prevalence rates would have appeared stable if we combined asthma and COPD, we examined the prevalence of asthma or COPD. An increase in prevalence rates for asthma and/or COPD was still noted.

Table 3. Prevalence rates for AMI, Asthma and Hip/pelvic Fracture in 2013, 2014 and 2015 for the Medicare Fee-for-Service enrolled population.

	2013 Prevalence	2014 Prevalence	2015 Prevalence
AMI	0.9	0.9	0.9
Asthma	5.2	5.2	6.1
<i>Asthma/COPD</i>	<i>14.3</i>	<i>14.3</i>	<i>16.7</i>
Hip/Pelvic Fracture	0.8	0.8	0.8

CONCLUSIONS

No disruption in receiving claims in the CCW database was seen with the conversion from ICD-9-CM to ICD-10-CM. In the first month after implementation of ICD-10-CM, fewer claims were processed than the same time period in 2014 for all claim types. These differences were narrowed over time and in most instances, more claims were received in December 2015 than in December 2014.

The ICD-10-CM diagnosis codes provide increased specificity of clinical conditions. The mapping between ICD-9-CM and ICD-10-CM diagnosis codes using the GEMS did not produce a 1:1 linkage for the chronic conditions examined. The number of codes associated with a condition did not necessarily increase the prevalence rates. The condition examined with the largest increase in number of unique diagnosis codes in ICD-10-CM compared to ICD-9-CM was hip/pelvic fractures, with over 10 times the number of codes associated ICD-10-CM. The increase in diagnosis codes was associated with the location, type and healing associated with a fracture/break – and did not conceptually alter the definition of the condition.

The prevalence rates for AMI and hip/pelvic fractures remained stable after the conversion from ICD-9-CM to ICD-10-CM, however an increase in asthma was detected. Although we suspected that the increase in asthma rates could be attributed to 3 ICD-10-CM codes (J44.0, J44.1, and J44.9), which were also associated with COPD using the GEMS, we found that both asthma and/or COPD prevalence was higher in 2015 after the ICD-10 conversion.

IMPLICATIONS

Researchers using the GEMS to map their ICD-9-CM diagnosis codes to ICD-10-CM diagnosis codes will need to validate their ICD-10-CM codes to identify the disease state of interest. Researchers should use caution when interpreting differences in prevalence rates with the transition to ICD-10-CM.

This material was developed under contract with the Centers for Medicare & Medicaid Services.

The algorithm that includes all ICD-9-CM and ICD-10-CM diagnosis codes used to identify the CCW Chronic Conditions can be found at: <https://www.ccwdata.org>

To obtain the CCW Chronic Condition data files, contact ResDAC at <http://www.resdac.org/>