Chronic Conditions Warehouse

Impact of Transition from 27 to 30 CCW Chronic Conditions

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1.0 Overview

The Centers for Medicare & Medicaid Services (CMS) created the 27 predefined Chronic Conditions Warehouse (CCW) common and chronic condition categories,[1] in collaboration with the Research Data Assistance Center (ResDAC) and the CCW team.[2] In 2020, CMS contracted an expert panel to validate the algorithms following the change from International Classification of Diseases (ICD)-9 to ICD-10-CM. CMS also asked the expert panel to refine these algorithms and identify additional conditions to add to the CCW, resulting in the 30 CCW Chronic Conditions algorithms. The CCW contains two versions of the Chronic Conditions algorithms: the 30 CCW Chronic Conditions (2017 forward) and the 27 CCW Chronic Conditions (1999–2020[3]). Data for these two sets of condition variables are available through two versions of the conditions file segment that are part of the annual CCW Master Beneficiary Summary (MBSF) suite of files:

1. the 27 CCW Chronic Conditions (available 1999-2020; delivered as the MBSF_CC_YYYY file), or
2. the 30 CCW Chronic Conditions (2017 forward; delivered as the MBSF_CHRONIC_YYYY file).

The algorithms examine service patterns in claims data, which serve as a proxy indicating that a beneficiary is likely receiving treatment for the condition. A description of these files is available in the *CCW Medicare Administrative Data User Guide* on the CCW website. A listing of all the variables in the data files, along with valid values, is available on the CCW Data Dictionary webpage. A list of abbreviations found in this document appears in Appendix A.

1.1 Objectives

The objectives of this document are to:

- Provide a high-level description of the condition definition and algorithm differences between the 27 CCW Chronic Conditions and the 30 CCW Chronic Conditions
- Compare the prevalence of the 27 CCW Chronic Conditions to the prevalence of the 30 CCW Chronic Conditions in the Medicare fee-for-service (FFS) data
- Identify the impact of the updated condition definitions on the first occurrence dates (also referred to as “ever” dates)
- Discuss implications for researchers in terms of switching to the 30 CCW Chronic Conditions file

2.0 Methods

The CCW team creates the MBSF Chronic Condition segment file (delivered as the MBSF_CC_YYYY file) to disseminate the 27 CCW Chronic Conditions data. The CCW team also creates an MBSF segment file for the 30 CCW Chronic Conditions (delivered as the MBSF_CHRONIC_YYYY file).

[1] As a historical note, when CCW data first became available, there were only 21 CCW conditions. When 2010 data became available, we revised 17 of the original 21 chronic conditions (CCs); the updated 27 CCs are available from 1999 forward.
[2] The original contractor for the CCW was the Iowa Foundation for Medical Care.
[3] The CCW team will produce the 2021 data file after the data matures for a full calendar year; we expect the final run of the MBSF_CC_2021 in the first quarter of 2023.

The 27 and 30 CCW Chronic Conditions are annual files containing summarized clinical information for all beneficiaries included in the requested cohort. The files include two variables[4] for each of the chronic conditions:

1. **Yearly indicator (or end-of-year indicator)** — indicates whether the beneficiary met each of the chronic condition definitions during the respective time period ending December 31, YYYY
2. **First occurrence date (or "ever" date)** — indicates the date the beneficiary first met the specifications for the condition (**NOTE:** For the 27 CCW Chronic Conditions file, 1999 is the earliest year that will appear in this field, and for the 30 CCW Chronic Conditions file, 2016 is the earliest year)

The MBSF Chronic Conditions segments include a record for each eligible beneficiary during the year and does not limit inclusion to those with a chronic condition. Although CMS began disseminating Medicare managed care encounter data for people enrolled in Medicare Advantage (MA) plans starting in 2015, the chronic condition algorithms currently do not consider encounter data. Therefore, users should view the CCW as a source of utilization and chronic condition information primarily for the Medicare FFS population.

2.1 Comparison of 27 CCW and 30 CCW Chronic Condition Algorithms

To ascertain the impact of the updated algorithms for the chronic conditions, the CCW team empirically examined the prevalence of conditions using the 27 CCW Chronic Conditions (27 CCW) compared to the 30 CCW Chronic Conditions (30 CCW). For the 2017 reporting period, the CCW team calculated prevalence for the 27 CCW algorithms using the MBSF_CC_2017 file and the requisite one-, two-, and three-year lookback periods. The CCW team also calculated prevalence for the 30 CCW algorithms using the MBSF_CHRONIC_2017 file,[5] which included the requisite one or two-year lookback periods (i.e., 2016–2017 Medicare FFS claims).

Within Table 1, the CCW team provides the 2017 Medicare prevalence rates for the 27 CCW, the 30 CCW, and the difference in prevalence rates. The CCW team depicts the difference in the two sets of algorithms two ways: first as a difference in prevalence rates (30 CCW prevalence minus 27 CCW prevalence) and second as a percentage change in the prevalence of beneficiaries identified with the condition (30 CCW prevalence – 27 CCW prevalence/27 CCW prevalence * 100). In addition to the prevalence statistics, the CCW team summarizes the differences between the 27 CCW Chronic Conditions algorithm and the 30 CCW Chronic Conditions algorithm in the right-most column of the table. The types of algorithm changes include the addition or deletion of diagnosis (DX) codes, an increase in the number of diagnosis code fields examined from the claim, the change in the types of claims files used, and the change in the number of years included in the lookback period. For specific details regarding the algorithms, refer to the CCW website.

[4] The MBSF_CC also includes a mid-year indicator variable for each of the conditions; it uses a July 1 timeframe rather than the calendar year.

[5] The CCW team calculates condition prevalence using standard CCW methodology (reference web tables B2a and B2b); the denominator is the subset of beneficiaries who had full or nearly full Medicare FFS coverage (i.e., 11 or 12 months of Medicare Parts A and B [or coverage until time of death] and one month or less of health maintenance organization [HMO] coverage). The numerator is the count of these beneficiaries who also met the FFS claims criteria for the algorithm.

Table 1. Conditions prevalence, 2017 — comparison of the difference in prevalence using 27 CCW algorithm coding to 30 CCW algorithm coding

Conditions*	27 CCW (%)	30 CCW (%)	Change in prevalence**	% Change in identified beneficiaries†	Summary of change to algorithm‡
Acute Myocardial Infarction	1.0%	1.2%	0.22%	23%	• Added DX codes • Look at all DX instead first 2
Alzheimer's Disease	4.3%	3.1%	-1.1%	-26%	• Decreased reference period from 3 to 2 years • Increased hospital outpatient (HOP)/carrier claims from 1 to 2
Anemia	22.5%	21.7%	-0.8%	-4%	• Added/removed DX codes • Increased reference period from 1 to 2 years • Increased HOP/carrier claims from 1 to 2
Asthma	5.3%	7.9%	2.6%	48%	• Increased reference period from 1 to 2 years
Atrial Fibrillation and Flutter	8.7%	13.1%	4.5%	52%	• Added DX codes • Increased reference period from 1 to 2 years • Added at least one skilled nursing facility (SNF) and home health agency (HHA) claim to the number/type of claims • Look at all DX instead of the first 2
Benign Prostatic Hyperplasia▲	16.8%	25.4%	8.6%	51%	• Removed DX codes • Increased reference period from 1 to 2 years
Cancer, Female Breast#	5.8%	7.4%	1.6%	27%	• Added DX codes • Increased reference period from 1 to 2 years
Cancer, Male Breast▲	0.06%	0.13%	0.07%	122%	• Added DX codes • Increased reference period from 1 to 2 years
Cancer, Colorectal	1.2%	1.6%	0.4%	33%	• Added DX codes • Increased reference period from 1 to 2 years
Cancer, Endometrial#	0.7%	1.0%	0.3%	45%	• Added DX codes • Increased reference period from 1 to 2 years
Cancer, Lung	1.1%	1.3%	0.2%	16%	• Increased reference period from 1 to 2 years
Cancer, Prostate▲	7.2%	8.9%	1.7%	24%	• Increased reference period from 1 to 2 years
Cancer, Urologic (Kidney, Renal Pelvis and Ureter)	n/a	0.7%	n/a	n/a	• n/a
Cataract	17.8%	25.8%	8.0%	45%	• Added/removed DX codes

Conditions*	27 CCW (%)	30 CCW (%)	Change in prevalence**	% Change in identified beneficiaries†	Summary of change to algorithm‡
Chronic Kidney Disease (CKD)	24.8%	16.3%	-8.5%	-34%	• Added/removed DX codes
Chronic Obstructive Pulmonary Disease	12.1%	15.9%	3.8%	31%	• Added/removed DX codes • Increased reference period from 1 to 2 years
Depression, Bipolar or Other Depressive Mood Disorders	18.4%	19.4%	1.0%	6%	• Added DX codes • Increased reference period from 1 to 2 years • Increased HOP/carrier claims from 1 to 2
Diabetes	28.0%	28.0%	0.0%	0%	• No change
Glaucoma	9.6%	13.8%	4.2%	44%	• Added/removed DX codes • Increased reference period from 1 to 2 years • Added at least 1 HOP claim to the number/type of claims • Look at all DX instead of the first 1
Heart Failure and Non-Ischemic Heart Disease	14.4%	12.1%	-2.2%	-16%	• Added DX codes • Added at least 1 SNF and HHA claim to number/type of claim • Increased HOP/carrier claims from 1 to 2
Hip/Pelvic Fracture	0.7%	1.2%	0.4%	57%	• Added DX codes • Added at least 1 HOP or carrier claim to the number/type of claims
Hyperlipidemia	48.3%	61.3%	13.1%	27%	• Increased reference period from 1 to 2 years
Hypertension	58.7%	67.8%	9.1%	16%	• Increased reference period from 1 to 2 years
Hypothyroidism^	15.9%	20.9%	5.0%	31%	• Added DX codes • Increased reference period from 1 to 2 years
Ischemic Heart Disease	27.8%	21.8%	-6.0%	-21%	• Added/removed DX codes • Increased HOP/carrier claims from 1 to 2
Non-Alzheimer's Dementia¶	11.3%	8.0%	-3.3%	-29%	• Added/removed DX codes • Decreased reference period from 3 to 2 years • Increased HOP/carrier claims from 1 to 2
Osteoporosis With or Without Pathological Fracture	6.6%	9.9%	3.3%	50%	• Added DX codes • Increased reference period from 1 to 2 years

Conditions*	27 CCW (%)	30 CCW (%)	Change in prevalence**	% Change in identified beneficiaries†	Summary of change to algorithm‡
Pneumonia, All Cause	n/a	5.5%	n/a	n/a	• n/a
Parkinson's Disease and Secondary Parkinsonism	n/a	1.7%	n/a	n/a	• n/a
Rheumatoid Arthritis/Osteoarthritis	34.2%	35.5%	1.3%	4%	• Added DX codes • Decreased inpatient (IP), SNF, and HHA claims from 2 to 1
Stroke/Transient Ischemic Attack	3.9%	6.6%	2.7%	68%	• Added/removed DX codes • Decreased HOP/carrier claims from 2 to 1

* We have ordered this table by the condition's name within the 30 CCW Chronic Conditions file.
** We calculate the change in prevalence as the 30 CCW % minus 27 CCW %.
† We calculate the % change in identified beneficiaries as (30 CCW minus 27 CCW) divided by 27 CCW times 100.
‡ CCW provided an abbreviated summary of the changes to the algorithm. For details, refer to the condition algorithms on the CCW website.
▲ Prevalence calculated for males only.
Prevalence calculated for females only.
^ For the 27 CCW Chronic Conditions, this condition is "Acquired Hypothyroidism."
¶ For the 27 CCW Chronic Conditions, this condition is "Alzheimer's Disease, Related Disorders, or Senile Dementia."

Researchers should be aware that some algorithm changes for the 30 CCW Chronic Conditions resulted in significant changes in the number of beneficiaries identified as having the condition. For example, Stroke/Transient Ischemic Attack (TIA) had a large increase in the number of beneficiaries, and Chronic Kidney Disease (CKD) had a large decrease in the number of beneficiaries identified in the 30 CCW Chronic Conditions.

The CCW team will continue producing the 27 CCW Chronic Conditions file through the 2021 data year to allow researchers the opportunity to complete research projects using the MBSF_CC_YYYY file. The last run of the 27 CCW Chronic Conditions file will occur in early 2023 (using 2021 FFS data).

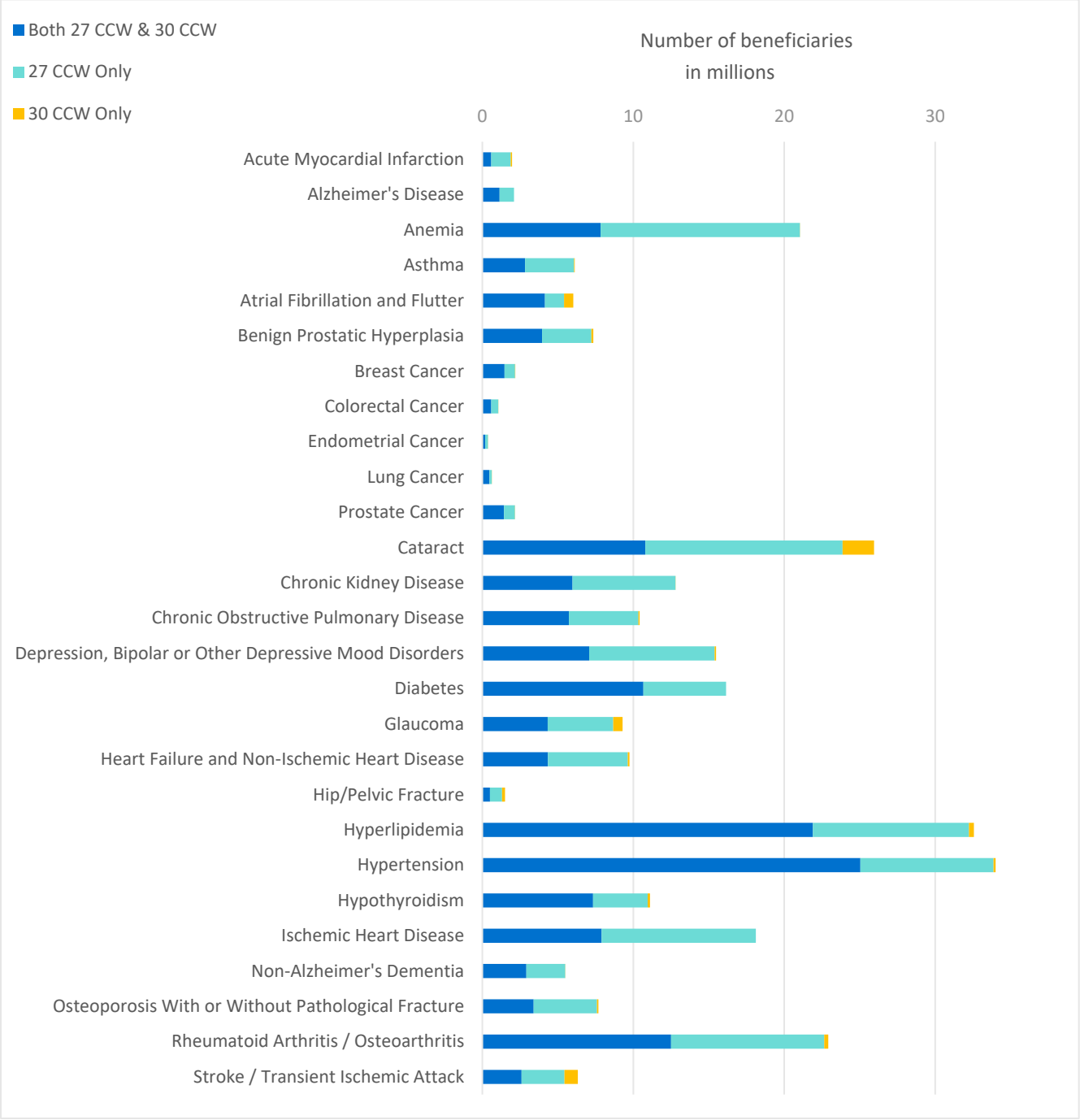
2.2 Comparison of Ever Dates

The algorithms for the 30 CCW Chronic Conditions data file use only ICD-10-CM diagnosis codes, which means the first full calendar year that the CCW team could use to identify conditions is 2016. Therefore, the earliest possible date that could appear in the "ever" date fields is January 1, 2016. This is a difference between the 27 CCW Chronic Conditions file, where the earliest "ever" date is January 1, 1999.

There are several reasons for differences in "ever" dates between the two MBSF Conditions files, including different dates between the two files or one file contains an "ever" date while the other does not. For some conditions, there may be many beneficiaries who had a prior history of claims for the condition that would no longer be appearing in the 30 CCW Chronic Conditions file. For example, a beneficiary could have an "ever" date for acute myocardial infarction (AMI) of 01/25/2011 in the 27 CCW Chronic Conditions, but since the 30 CCW Conditions only go back to 2016, their ever date in the 30 CCW Chronic Conditions is null. There are also changes in the algorithm specifications that could result in a broader (or narrower) group of beneficiaries meeting the updated criteria for the condition(s) in the 30 CCW Chronic Conditions file; this could result in different "ever" dates in the two files.

To address how different the first occurrence dates are using the updated 30 CCW Chronic Conditions algorithms, the CCW team compared "ever" dates identified by the 27 CCW Chronic Conditions algorithms to "ever" dates identified by the 30 CCW Chronic Conditions algorithms. For this analysis, the CCW team identified all beneficiaries with first occurrence dates for each condition within the MBSF_CHRONIC_2017 and MBSF_CC_2017 files. To have a first occurrence date in the MBSF_CHRONIC_2017 file, the data identifies the beneficiary with the condition in either 2016 or 2017 (i.e., the beneficiary had a value of '1' or '3' for the condition category). In each of these instances, the data file populates an "ever" date greater than or equal to 01/01/2016data file. In Figure 1 below, the CCW team calculated the unduplicated count of beneficiaries with an ever date for the condition in one or both files. The CCW team provides detailed beneficiary counts in Table 2 and Table 3 within Appendix B.

Figure 1. Counts of beneficiaries with an "ever" date in either of the MBSF CCW Conditions files, 2017



This figure displays the number of beneficiaries with an ever date in either of the MBSF CCW Conditions files for each condition. This visual depiction makes it easy to understand the magnitude of conditions; the corresponding percentages are in Appendix B (reference Table 2). Among the beneficiaries with an occurrence of a condition in either file, we observed that 30–75% of beneficiaries (depending on the condition) have an "ever" date in both files.

- The Acute Myocardial Infarction (AMI) and Hip/Pelvic Fracture conditions have a relatively low percentage of beneficiaries with "ever" dates in both files (30% and 33%, respectively), while the Hypertension (74%) and Lung Cancer (75%) conditions have a relatively large percentage of beneficiaries with ever dates in both files

In general, the algorithms for the 30 CCW Chronic Conditions did not result in many new condition occurrences gained. Between 0–14% (depending on condition) of beneficiaries have an ever date in the 30 CCW Chronic Conditions file, but not in the 27 CCW Chronic Conditions file.

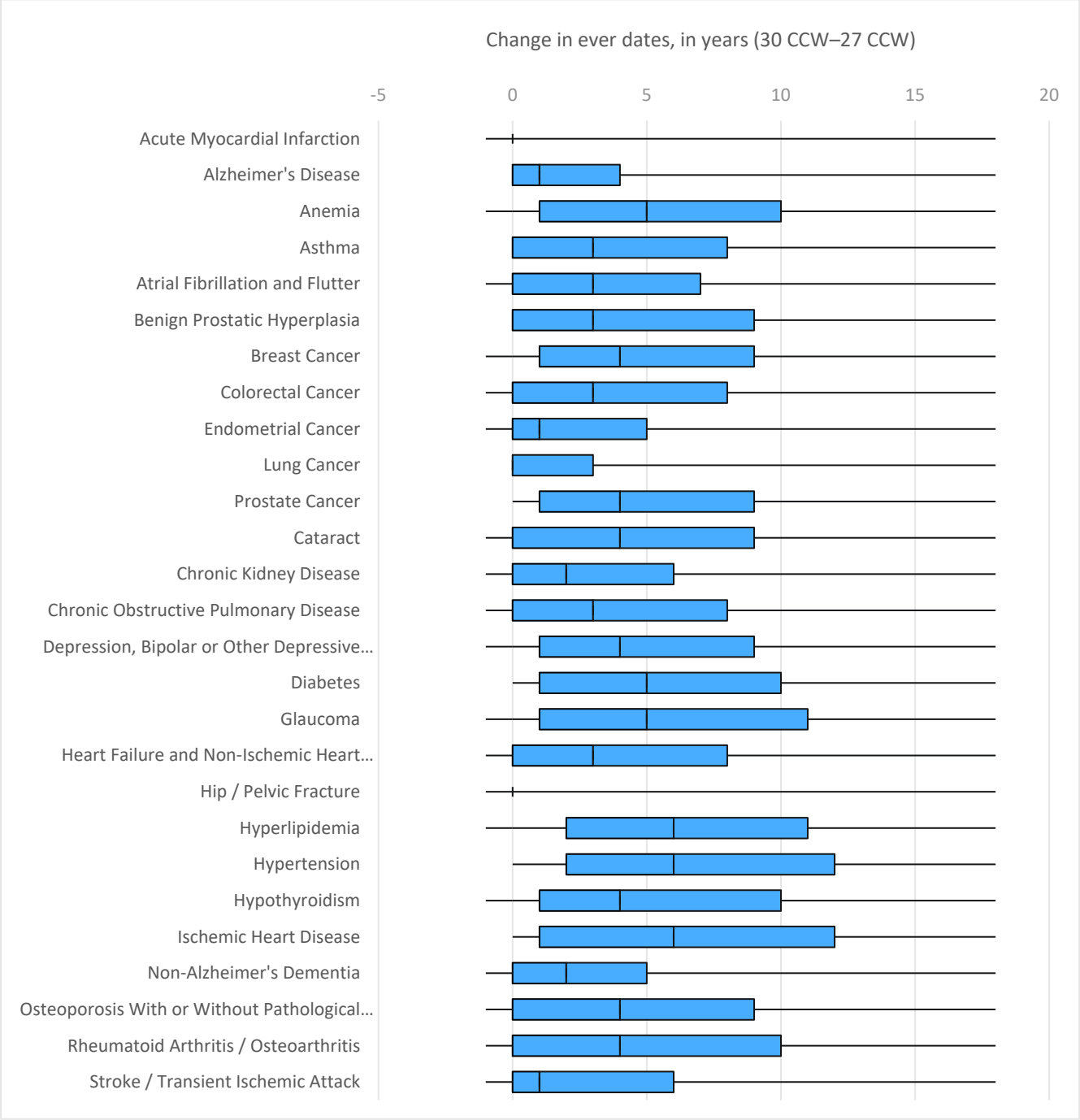
- This occurred most frequently for the Hip/Pelvic Fracture (13%) and Stroke/TIA (14%) conditions, and in <1% of beneficiaries for most other conditions

Depending on the condition, between 21–66% of beneficiaries with an "ever" date only have an "ever" date populated in the 27 CCW Chronic Condition file and not in the 30 CCW Chronic Condition file (Figure 1).

- The AMI (66%) and Anemia (63%) conditions resulted in larger losses in historical occurrences

For the subset of beneficiaries with an "ever" date in both the 27 and 30 CCW Chronic Condition files, the CCW team compared the first occurrence dates between the two files to determine whether they were identical. Beneficiary counts are in Table 3 of Appendix B. We graphically depict the difference in the "ever" dates for beneficiaries in both files to illustrate the magnitude of change for each condition. Figure 2 is a boxplot that shows the median number of years difference, and the 25 and 75 percentiles for the number of years' difference in the first occurrence date. The boxes within the plots display the interquartile range (25 through 75 percentile), with the median value depicted as a vertical bar within the box. The minimum value possible is -1 year, and the maximum is 18 years.

Figure 2. Distribution of first occurrence dates in the MBSF CCW Conditions files, 2017



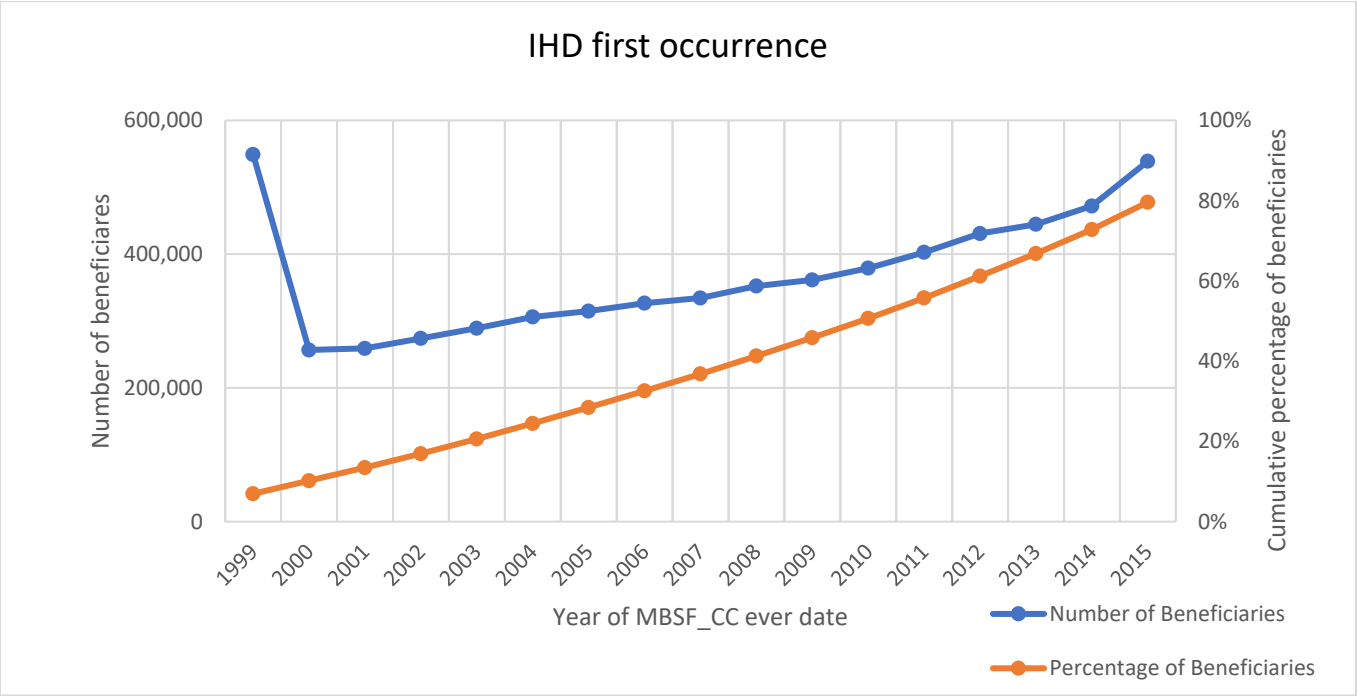
- Although there are a small number of beneficiaries with differing “ever” dates in the two files for AMI, Lung Cancer and Hip/Pelvic Fracture, the median number of years difference between “ever” dates for the beneficiaries with conditions in both files is zero

- For Hyperlipidemia, Hypertension, Ischemic Heart Disease (IHD), and Glaucoma the median number of years’ difference is six years. Similarly, the 75 percentile (Q3) for these three conditions is large: 12 years for Hypertension and IHD and 11 years for Hyperlipidemia and Glaucoma

- For each of the 27 conditions, there were beneficiaries for whom the "ever' date is 18 years different (i.e., it was in 1999 in the MBSF_CC file)

For some conditions, there are a large number of beneficiaries who had a first occurrence date before 2016. The first occurrence date is often in 1999, which is the earliest year possible in the 27 CCW Chronic Conditions file. We illustrate using one condition, IHD, with a fairly high percentage of beneficiaries with the condition in the MBSF_CHRONIC_2017 file who had an earlier "ever" date in the MBSF_CC_2017 (96.2%, n=7,902,514; as in Table 3). Reference Figure 3.

Figure 3. First "ever" date for beneficiaries with IHD in both MBSF Chronic Conditions files in 2017



- Among the beneficiaries with an IHD "ever" date in both files, 80% have an MBSF_CC_2017 "ever" date between 1999–2015. This mainly explains 96.2% of the differences observed between "ever" dates in the two files (Table 3)
  - Additional differences in the "ever" dates for IHD between the files are that 299,700 beneficiaries had a date in 2016 or 2017, yet the date was earlier in the MBSF_CC_2017 file than the MBSF_CHRONIC_2017 file. This is likely due to the differences in the algorithm specifications, where the 30 CCW Chronic Conditions algorithm requires two HOP or carrier claims to meet the criteria rather than the required, single HOP/carrier claim in the 27 CCW Chronic Conditions algorithm (Table 1).
- Almost 7% of these beneficiaries have a 1999 "ever" date in MBSF_CC_2017
- Following the earliest possible year (1999), the "ever" dates from 2000–2015 distribute evenly — with about a 3% increase in the number of beneficiaries from year to year
- Twenty percent of beneficiaries have "ever" dates in 2016–2017 (data not shown). The CCW team observes the "ever" dates in 2016–2017 more frequently than any other year among beneficiaries who have ever dates in both files

3.0 Summary and Recommendations

The CCW team will no longer produce the 27 CCW Chronic Conditions file after the 2021 data file; it is available for data years 2000–2021.[6] The CCW team will only deliver the 30 CCW Chronic Conditions file going forward. The CCW team recommends researchers switch to using the 30 CCW Chronic Conditions files as soon as reasonably possible. Since there are five years of overlap between the 27 and 30 CCW Chronic Conditions (i.e., data for both sets of algorithm variables are available for 2017–2021), researchers may empirically examine the impact of the algorithm changes for their studies.

Due to the limited historical claims pattern available in the 30 CCW Chronic Conditions file, researchers should use caution with the "ever" dates, since many beneficiaries may have had a first occurrence date for the condition (as specified using the 27 CCW Chronic Condition coding) that preceded 2016. Using the "ever" dates in the 30 CCW Chronic Conditions file to identify beneficiaries with a prior history of the condition, may not yield accurate information regarding the first ever date when the beneficiary met the condition criteria in Medicare FFS claims. The exception is when the beneficiary was newly enrolled in Medicare in 2016 or later, which the COVSTART variable in the MBSF captures.

[6] The CCW team will produce the 2021 data file after the data matures for a full calendar year; we expect the final run of the MBSF_CC_2021 in the first quarter of 2023.

Appendix A — List of Acronyms

Acronym	Definition
AMI	Acute Myocardial Infarction
CC	Chronic Conditions
CCW	Chronic Conditions Warehouse
CMS	Centers for Medicare & Medicaid Services
DX	Diagnosis
FFS	Fee-for-service
HHA	Home Health Agency
HOP	Hospital Outpatient
ICD	International Classification of Diseases
IHD	Ischemic Heart Disease
IP	Inpatient
MA	Medicare Advantage
MBSF	Master Beneficiary Summary File
ResDAC	Research Data Assistance Center
SNF	Skilled Nursing Facility
TIA	Transient Ischemic Attack

Appendix B — Supplemental Data

The CCW team compared the "ever" dates for the 27 CCW Chronic Conditions in the MBSF_CC_2017 to the "ever" dates for the same conditions in the MBSF_CHRONIC_2017 file. We classify beneficiaries with an "ever" date in either file into one of three categories: 1) having an "ever" date in both files, 2) "ever" date only in the 27 CCW Chronic Conditions file (MBSF_CC), or 3) "ever" date only in the 30 CCW Chronic Conditions file (MBSF_CHRONIC). We present a related graphic, Figure 1, in the main body of this paper.

Table 2. Counts of beneficiaries with "ever" date in the conditions files, 2017

Condition	"Ever" date in 27 CCW or 30 CCW (total beneficiaries)	In both 27 CCW and 30 CCW (benes)	Both (%)	In 27 CCW only (benes)	27 CCW (%)	In 30 CCW only (benes)	30 CCW (%)
Acute Myocardial Infarction	**1,969,802**	590,072	30.0%	1,290,967	65.5%	88,763	4.5%
Alzheimer's Disease	**2,093,499**	1,136,926	54.3%	956,573	45.7%	0	0.0%
Anemia	**21,041,243**	7,835,209	37.2%	13,201,168	62.7%	4,866	0.0%
Asthma	**6,115,770**	2,828,844	46.3%	3,246,804	53.1%	40,122	0.7%
Atrial Fibrillation and Flutter	**6,023,806**	4,149,821	68.9%	1,266,318	21.0%	607,667	10.1%
Benign Prostatic Hyperplasia	**7,348,583**	3,953,206	53.8%	3,272,729	44.5%	122,648	1.7%
Breast Cancer	**2,185,316**	1,466,891	67.1%	696,336	31.9%	22,089	1.0%
Colorectal Cancer	**1,056,877**	593,429	56.1%	458,545	43.4%	4,903	0.5%
Endometrial Cancer	**374,785**	186,772	49.8%	184,566	49.2%	3,447	0.9%
Lung Cancer	**621,718**	466,965	75.1%	153,183	24.6%	1,570	0.3%
Prostate Cancer	**2,166,626**	1,436,888	66.3%	718,947	33.2%	10,791	0.5%
Urologic Cancer (Kidney, Renal Pelvis and Ureter)	n/a						
Cataract	**25,950,736**	10,795,518	41.6%	13,070,024	50.4%	2,085,194	8.0%
Chronic Kidney Disease	**12,796,549**	5,969,876	46.7%	6,826,012	53.3%	661	0.0%
Chronic Obstructive Pulmonary Disease	**10,419,348**	5,733,307	55.0%	4,608,622	44.2%	77,419	0.7%
Depression, Bipolar or Other Depressive Mood Disorders	**15,482,171**	7,075,576	45.7%	8,310,360	53.7%	96,235	0.6%
Diabetes	**16,141,644**	10,667,991	66.1%	5,473,653	33.9%	0	0.0%
Glaucoma	**9,288,918**	4,326,870	46.6%	4,340,802	46.7%	621,246	6.7%
Heart Failure and Non-Ischemic Heart Disease	**9,743,302**	4,341,447	44.6%	5,295,595	54.4%	106,260	1.1%
Hip/Pelvic Fracture	**1,500,559**	505,155	33.7%	797,055	53.1%	198,349	13.2%
Hyperlipidemia	**32,564,866**	21,899,277	67.2%	10,337,893	31.7%	327,696	1.0%
Hypertension	**34,003,364**	25,041,546	73.6%	8,826,096	26.0%	135,722	0.4%
Hypothyroidism	**11,108,320**	7,336,251	66.0%	3,614,208	32.5%	157,861	1.4%

Condition	"Ever" date in 27 CCW or 30 CCW (total beneficiaries)	In both 27 CCW and 30 CCW (benes)	Both (%)	In 27 CCW only (benes)	27 CCW (%)	In 30 CCW only (benes)	30 CCW (%)
Ischemic Heart Disease	**18,115,613**	7,902,514	43.6%	10,213,098	56.4%	1	0.0%
Non-Alzheimer's Dementia	**5,488,875**	2,917,887	53.2%	2,569,075	46.8%	1,913	0.0%
Osteoporosis With or Without Pathological Fracture	**7,684,022**	3,393,749	44.2%	4,202,402	54.7%	87,871	1.1%
All Cause Pneumonia	n/a						
Parkinson's Disease and Secondary Parkinsonism	n/a						
Rheumatoid Arthritis / Osteoarthritis	**22,917,221**	12,498,928	54.5%	10,146,118	44.3%	272,175	1.2%
Stroke / Transient Ischemic Attack	**6,323,005**	2,600,124	41.1%	2,837,539	44.9%	885,342	14.0%

For some conditions, it was common to have an occurrence date in both files (between 30-75% of beneficiaries have "ever" dates in both files, depending on the condition). Only a few of the algorithms for the 30 CCW Chronic Conditions resulted in a relatively large percentage of new condition occurrences gained (e.g., Stroke/TIA and Hip/Pelvic Fracture). Depending on the condition, between 21-66% of beneficiaries with an "ever" date only have an "ever" date populated in the 27 CCW Chronic Condition file and not in the 30 CCW Chronic Condition file.

For the subset of beneficiaries with an ever date in both files, the CCW team compared the first occurrence dates between the two files to determine whether they were identical (Table 3). We present a related illustration in the main body of this paper (reference Figure 3).

Table 3. Comparison of first occurrence dates for conditions in the two files

Condition	Ever date in both 27 CCW and 30 CCW (total beneficiaries)	27 CCW < 30 CCW date (benes)	27 CCW < 30 CCW date (%)	27 CCW = 30 CCW date (benes)	27 CCW = 30 CCW date (%)	27 CCW > 30 CCW date (benes)	27 CCW > 30 CCW date (%)
Acute Myocardial Infarction	**590,072**	93,679	15.9%	487,607	82.6%	8,786	1.5%
Alzheimer's Disease	**1,136,926**	1,027,985	90.4%	108,941	9.6%	0	0.0%
Anemia	**7,835,209**	7,413,990	94.6%	418,396	5.3%	2,823	0.0%
Asthma	**2,828,844**	1,907,843	67.4%	901,058	31.9%	19,943	0.7%
Atrial Fibrillation and Flutter	**4,149,821**	2,910,547	70.1%	778,093	18.8%	461,181	11.1%
Benign Prostatic Hyperplasia	**3,953,206**	2,787,886	70.5%	1,118,750	28.3%	46,570	1.2%
Breast Cancer	**1,466,891**	1,127,493	76.9%	332,684	22.7%	6,714	0.5%
Colorectal Cancer	**593,429**	396,479	66.8%	195,021	32.9%	1,929	0.3%
Endometrial Cancer	**186,772**	109,350	58.5%	76,413	40.9%	1,009	0.5%

Condition	Ever date in both 27 CCW and 30 CCW (total beneficiaries)	27 CCW < 30 CCW date (benes)	27 CCW < 30 CCW date (%)	27 CCW = 30 CCW date (benes)	27 CCW = 30 CCW date (%)	27 CCW > 30 CCW date (benes)	27 CCW > 30 CCW date (%)
Lung Cancer	**466,965**	218,550	46.8%	247,189	52.9%	1,226	0.3%
Prostate Cancer	**1,436,888**	1,102,906	76.8%	329,124	22.9%	4,858	0.3%
Urologic Cancer (Kidney, Renal Pelvis and Ureter)	n/a						
Cataract	**10,795,518**	7,654,657	70.9%	2,552,682	23.6%	588,179	5.4%
Chronic Kidney Disease	**5,969,876**	4,660,147	78.1%	1,309,439	21.9%	290	0.0%
Chronic Obstructive Pulmonary Disease	**5,733,307**	3,895,383	67.9%	1,793,572	31.3%	44,352	0.8%
Depression, Bipolar or Other Depressive Mood Disorders	**7,075,576**	6,570,146	92.9%	455,634	6.4%	49,796	0.7%
Diabetes	**10,667,991**	8,491,657	79.6%	2,176,334	20.4%	0	0.0%
Glaucoma	**4,326,870**	3,428,629	79.2%	581,007	13.4%	317,234	7.3%
Heart Failure and Non-Ischemic Heart Disease	**4,341,447**	4,023,300	92.7%	278,673	6.4%	39,474	0.9%
Hip/Pelvic Fracture	**505,155**	116,731	23.1%	21,335	4.2%	367,089	72.7%
Hyperlipidemia	**21,899,277**	18,047,893	82.4%	3,613,039	16.5%	238,345	1.1%
Hypertension	**25,041,546**	20,825,235	83.2%	4,111,919	16.4%	104,392	0.4%
Hypothyroidism	**7,336,251**	5,737,521	78.2%	1,535,919	20.9%	62,811	0.9%
Ischemic Heart Disease	**7,902,514**	7,602,814	96.2%	299,700	3.8%	0	0.0%
Non-Alzheimer's Dementia	**2,917,887**	2,561,073	87.8%	354,617	12.2%	2,197	0.1%
Osteoporosis With or Without Pathological Fracture	**3,393,749**	2,373,245	69.9%	975,555	28.7%	44,949	1.3%
All Cause Pneumonia	n/a						
Parkinson's Disease and Secondary Parkinsonism	n/a						
Rheumatoid Arthritis / Osteoarthritis	**12,498,928**	9,435,276	75.5%	2,864,595	22.9%	199,057	1.6%
Stroke / Transient Ischemic Attack	**2,600,124**	1,460,361	56.2%	92,490	3.6%	1,047,273	40.3%

- For some conditions, a large proportion of beneficiaries have an “ever” date in the 27 CCW Chronic Conditions file (MBSF_CC_2017) that is prior to the date that appears in the 30 CCW Chronic Conditions file (MBSF_CHRONIC_2017).
- Although fewer conditions had beneficiaries with “ever” dates in the 30 CCW Chronic Conditions file that preceded the “ever” date in the 27 CCW Conditions file, this was common for Hip/Pelvic Fracture and Stroke/TIA.