

PIAR Report: Impact of Medicare Advantage Changes

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Introduction

Given the increase in ESRD patients enrolled in Medicare Advantage over the last decade, we initiated several rounds of exploration to determine the feasibility of including ESRD MA beneficiaries into select clinical quality measures. During the 2020 endorsement and measure maintenance reevaluation cycle, we performed analyses examining the Medicare Advantage (MA) population in comparison to the Fee-For-Service (FFS) population, and made changes in our measure models to handle the MA patients appropriately (either through excluding those patients, or adjusting for them). Because we now have access to MA Part C claims, additional changes and enhancements to the measures are possible. For the 2025 measure maintenance reevaluation cycle, we are again evaluating the impact of including MA patients in the ESRD measures and looking at ways to take advantage of this new data source. This report outlines our investigations to date including information from the literature and analyses looking at potential methods for incorporating Part C MA claims into our models of mortality (SMR), transfusions (STrR), hospitalization (SHR, SRR), and ED use (SEDR, ED30). Where possible, we describe the changes we plan to incorporate in the respective measure models during this maintenance cycle. Please note that these changes are tentative as analyses are still in progress.

Executive Summary

Throughout this report, you will find our detailed processes, results, and recommendations by measure. A brief summary of those recommendations include:

Standardized Hospitalization Ratio (SHR)

This measure already included MA patients in the population. We suggest the following revisions to improve the methodology.

- Include all claim types in the prevalent comorbidity adjustments, instead of only Medicare Advantage Part A inpatient claims.
- Change the Medicare Advantage adjustment from proportion of the period at risk to a time dependent binary variable.
- For identifying hospitalization events, consider the inclusion of Medicare Advantage Part C inpatient claims in addition to the Part A claims.

Standardized Mortality Ratio (SMR)

This measure already included MA patients in the population. We suggest the following revisions to improve the methodology.

- Include all claim types in the prevalent comorbidity adjustments, instead of only Medicare Advantage Part A inpatient claims.
- Change the Medicare Advantage adjustment from proportion of the period at risk to a time dependent binary variable.

Standardized Readmission Ratio (SRR)

This measure already included MA patients in the population. We suggest the following revisions to improve the methodology.

- Incorporate Medicare Advantage Part C to identify inpatient prevalent comorbidity diagnoses.
- Consider the inclusion of Medicare Advantage Part C inpatient claims to identify index discharges and readmissions.

Standardized Emergency Department Ratio (SEDR)

This measure did not include MA patients, and we recommend including them in the population in the revised measure. We also suggest the following changes to improve the methodology.

- Incorporate Part C outpatient claims to identify ED visits for Medicare Advantage patients.
- Include all Part C claims for prevalent comorbidity adjustment.
- Adjust for Medicare Advantage by including a time dependent covariate.

Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30)

This measure did not include MA patients, and we recommend including them in the population in the revised measure. We also suggest the following changes to improve the methodology.

- Incorporate Part C outpatient claims to identify ED visits for Medicare Advantage patients.
- Consider the inclusion of Medicare Advantage Part C inpatient claims to identify index discharges.

Standardized Transfusion Ratio (STrR)

This measure did not include MA patients, and we recommend including them in the population in the revised measure. We also suggest the following changes to improve the methodology.

- Incorporate Part C claims to identify transfusion events.
- Bridge overlapping claims for identifying transfusion events.
- Incorporate Medicare Advantage Part C to identify prevalent comorbidity diagnoses.
- No longer exclude patient time with comorbidities in the one-year look-back period.
- Adjust for comorbidities present in the one-year look-back period prior to each observation window.

Details of these recommendations and how we arrived at these ideas can be found throughout the remainder of this report.

Recent Changes to Medicare Advantage Coverage Rules for ESRD Patients

Medicare Advantage (MA) enrollment represents a significant portion of the Medicare population, with estimates indicating that around 40% of all Medicare beneficiaries were enrolled in MA plans in 2023. This trend continues to grow, especially following pivotal legislative changes that have expanded access for End-Stage Renal Disease (ESRD) patients, and allowed ESRD beneficiaries to enroll in MA plans beginning in CY 2021.

Historically, due to the Balanced Budget Act of 1997, ESRD patients faced restrictions when attempting to enroll in MA plans unless they were already members of an MA plan before their diagnosis. Legislative adjustments, such as those found in the "Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000," as well as rulemaking by CMS to permit enrollment in MA Special Needs Plans, have provided further exceptions over time.

Passage of the 21st Century Cures Act in 2016, effective January 1, 2021, removed barriers that had previously prevented ESRD patients from enrolling in MA plans. This legislative change has led to a substantial increase in the number of ESRD beneficiaries covered by MA plans, which could account for possibly half of the MA population in the upcoming years (MedPAC 2021 Report to Congress).

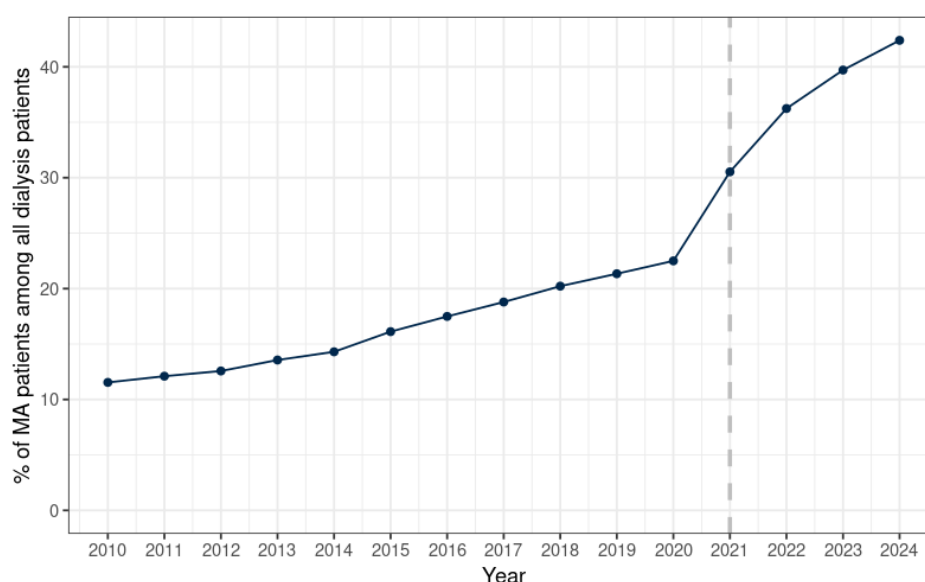


Figure 1: Percentage of Medicare Advantage among ESRD dialysis patients, 2010 - 2024.

Note: The dashed grey line marks the effective date of the 21st Century Cures Act.

Based on enrollment information from the Medicare Enrollment Database (EDB), the percentage of ESRD dialysis beneficiaries enrolled in Medicare Advantage (MA) has steadily increased over time. From 12% in 2010, the proportion rose to 22% by 2020. Prior to 2020, there was an annual increase of approximately 1%. However, since 2021, the annual increase has been more than 5% (see Figure 1).

The growth in ESRD beneficiaries joining MA plans carries significant implications for the metrics used to assess dialysis facility performance. Contrary to the data from Fee-For-Service (FFS) Medicare

beneficiaries, MA outpatient encounters and administrative records have not been readily available for the purposes of analyzing facility quality, except for internal CMS use in risk adjustment and performance assessment (MedPAC 2019).

Figure 2 below illustrates the variability in the distribution of MA patient months across dialysis facilities in 2023. The histogram underscores the uneven enrollment in MA plans, with discrepancies ranging from facilities where the majority of patients are under MA plans to those serving no MA patients at all, reflecting the national range of MA market penetration. This variability highlights the challenges in uniformly applying quality measures and the necessity for complete and inclusive data on MA beneficiaries in developing such measures. Ensuring a fair and accurate reflection of the care provided across the healthcare spectrum requires incorporating the full range of beneficiary coverage type into our evaluation metrics.

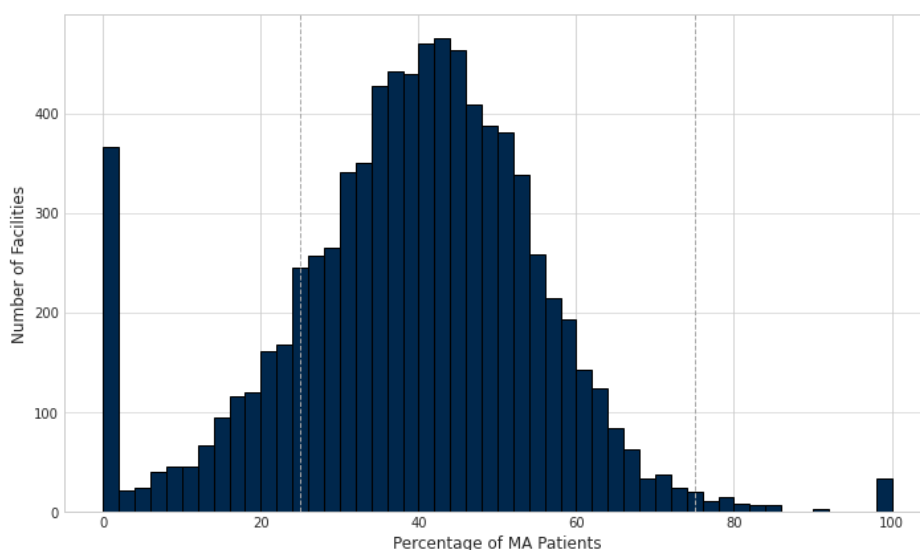


Figure 2: Histogram of Percentage of MA Patient Months among all ESRD Dialysis Patients across Dialysis Facilities, 2023

Since 2012, MA plans have been providing comprehensive encounter data to CMS through the Encounter Data System (EDS). These submissions, subject to various checks for quality assurance, reflect the information typically found in FFS claims. They are inclusive of direct encounter details and chart review records, the latter contributing additional diagnostic information for risk adjustment. It is important to note that Medicare FFS claims often require only one diagnosis to justify a service. However, Medicare Advantage encounter submissions may be different due to incentives regarding the number of diagnoses included. As a result, there remains some uncertainty about how comparable the diagnoses obtained from these two sources are, most importantly when used for the purposes of comorbidity risk adjustment.

The quality and completeness of MA encounter data have been the focus of MedPAC's scrutiny, notably using data spanning 2012-2015. MedPAC compared the encounter data with external datasets—Medicare Provider Analysis and Review (MedPAR) for inpatient services, risk adjustment data for dialysis services, the Outcome and Assessment Information Set (OASIS) for home health services, and the Minimum Data Set (MDS) for skilled nursing facility stays. These comparisons initially showed varied

agreement levels between sources, with conjunction appearing to improve based on the latest available data from 2017.

Description of Medicare Advantage/ESRD Literature Search

As part of the investigation of suitability for inclusion of Medicare Advantage Encounter data into ESRD quality measures developed and maintained by UM-KECC for CMS, we evaluated the available medical and health policy literature for scholarly work that could be informative about potential differences in outcomes and use of comorbidity reporting between traditional FFS Medicare and Medicare Advantage (MA) programs. Our PUBMED search strategy focused on MeSH Major Topics of mortality/survival, hospitalization, hospital readmission, and a composite of general search terms for emergency department utilization. For each of these topics, we limited searches to those including the term “chronic dialysis.” We also performed a different primary search focused on MeSH Major Topics of mortality/survival, hospitalization, hospital readmission, and a composite of general search terms for emergency department utilization AND Medicare Advantage. In addition, we performed a secondary search that further restricted the MA series to include “chronic dialysis” (see Appendix for details and included search terms).

One clinical investigator scanned the initial search result set of 874 citations to identify extraneous and duplicate citations. After exclusion, the resulting 830 unique citations included 248 citations from the MA AND primary outcome term searches (mortality/survival, hospitalization, ED use, readmission) and only 3 citations from the MA AND chronic dialysis AND primary outcome secondary searches. These three were combined with the other MA-related citations for review by the senior clinical investigator and faculty members of the various comprehensive measure review workgroups underway during OY1.

The review of citations continues, but to date, only a small number of citations contain pertinent background information that has influenced our analyses or helped explain results to date. As additional expert review is accumulated from our senior investigative team, we can include impactful publications in our quality measure CBE endorsement documentation.

Addition of Medicare Advantage Claims

The current set of measures do not utilize Part C MA claims. Recent availability of the MA claims allows for a number of potential changes to the measures with regards to risk adjustment and exclusion criteria. We began our assessments with how the inclusion of ESRD MA patients and corresponding Part C Medicare Advantage claims may impact the measures SHR, SMR, SRR, STrR, SEDR, and ED30. Our initial work analyzed patient characteristics and the comparability of prevalent comorbidities across FFS and MA claims. We studied how inclusion of additional prevalent comorbidity data from other claim sources, including Part C data, might modify model results. We also considered how best to control for periods of time a patient is identified to fall under FFS or MA insurance classification. In addition, for the STrR model, we studied how comorbidities served as measure exclusions and re-considered how to better incorporate this data without compromising inclusion in the model. We also evaluated whether having Part C claims available would allow us to broaden the STrR, ED30, and SEDR measures to include ESRD MA patients.

Patient Payor History

To identify patients for inclusion in the measures, we need to identify Medicare coverage for each patient over time. Measures may include all ESRD patients regardless of payor type, Medicare primary patients only (FFS or MA), or Medicare FFS primary only. We look at Medicare utilization to identify FFS patients. Patients with at least \$1,200 of dialysis claims or an inpatient stay in a month are considered Medicare primary for that month and the following two months.

A Medicare Beneficiary could have Medicare either as their primary or secondary health insurance, and Medicare as a secondary insurance likely will not include claims for all medical events (due to coordination of benefits with non-Medicare insurance). For many years we have included a "use test" to allow exclusion of most Medicare secondary patients. The rationale for including a ESRD dialysis patient as "Medicare (primary)" based on the use test is that if hospitalization(s) generate Medicare claims and/or a patient incurs \$1,200 or more in paid outpatient dialysis claims, then they are likely Medicare primary. When this was initially applied approximately two decades ago, the paid dialysis claims amount was \$900 (roughly equivalent to 3 x the capitated dialysis facility payment for a dialysis session). After implementation of the expanded PPS payment, the value was raised to \$1,200 to take the increased capitated payment into account. It should be noted that other organizations (Arbor Research and USRDS) working in this field use the same or similar criteria to identify Medicare patients with robust claims histories.

Since inpatient stays include MA patients due to the availability of no-pay "shadow claims," this captures some, but not all MA patients. In order to identify all MA patients and to distinguish them from FFS, we use the Medicare Enrollment Database (EDB) to identify months where a patient is MA. We plan to retain these definitions for the measures. In the future we could consider whether incorporating a utilization test for MA would be helpful. This would be based on number of dialysis sessions since we do not have access to payment information for MA patients.

Events

The transfusion and emergency department visit measures have outcomes based on outpatient claims and therefore originally excluded MA patients because Part C outpatient encounter claims were not yet available to us. With the availability of MA outpatient claims, we can now identify these events for MA patients and include MA patients in the measures going forward (see STrR, SEDR, and ED30 sections below). Hospitalization events (SHR and SRR) are currently identified from Part A inpatient claims. Because no-pay shadow claims for MA patients have historically been included in Part A claims (due to the disproportionate share hospital reporting requirements), we believe we have nearly complete ascertainment of hospitalization events for FFS and MA without the Part C claims. With the Part C claims, we will be able to verify this assumption and see if it is possible to identify additional MA hospitalizations not captured through Part A no-pay inpatient claims.

Medicare Advantage Adjustment

Adjustment for MA is important in order to control for potential differences in outcomes potentially related to MA versus FFS coverage type. In the current SHR and SMR models, we identify the percent of time at risk during an analysis period that the patient had MA coverage. The current SRR model adjusts

based on MA status at index discharge. We have now evaluated a more direct way to control for MA coverage in the SMR and SHR, using a time dependent adjustment for MA (yes/no) for these measures and plan to move to this method. In our new models, payment history is analyzed to create a time dependent covariate identifying when a patient is part of a traditional FFS plan or a Medicare Advantage plan. In order to make this update, we implemented a new approach to splitting up the time at risk for each patient, which increases the number of records that are included in the data for the model, but the number of patients and actual time at risk remains unchanged. With the inclusion of MA patients to both the ED measures and STTrR, MA adjustment is also considered for those models. In addition, we will evaluate interactions between MA status and various covariates (e.g., patient characteristics, comorbidities) in the measure models.

Comorbidities

Our current measure methodology uses claims to identify prevalent comorbidities for adjustment and for patient exclusion. Historically, claim availability for MA patients had been limited to shadow inpatient claims and therefore measures including MA patients generally had comorbidities based on these shadow inpatient claims only. With the availability of the Part C claims, we now have all Medicare claims available (inpatient (IP), outpatient (OP), home health (HH), skilled nursing (SN), hospice (HS), and physician supplier (PS)) for both traditional FFS and MA patients and can therefore consider using both FFS and MA claims for comorbidity ascertainment. It is possible that there are differences in the frequency and type of comorbidities for those with traditional FFS or MA due to differing payment structures in the two programs. Before modifying comorbidity ascertainment in the models, we compared the prevalence of comorbidities ascertained from all claims for FFS and MA patients. We found similar patterns for most prevalent comorbidities.

While there are differences in the prevalent comorbidity adjustments applied across models, they are generally a result of looking at diagnoses present on claims over a one-year period. In order to have a more complete understanding of the differences between the FFS and MA claims, we focused on the set of 91 comorbidities that are included in the SMR and SHR models. Most of the comorbidities we considered are fairly uncommon in both groups and the prevalence is similar in the two groups. Among the more common comorbid conditions, MA patients had higher prevalence of diabetes related comorbidities as well as peripheral and visceral atherosclerosis, asthma, COPD, and obesity. Based on these results (described in detail below), we decided it was reasonable to move to comorbidity ascertainment using all FFS and MA claim types.

We made this change for SMR and SHR (details on the effect of this change appear in the SMR and SHR sections below). For SRR, we decided to continue using only inpatient experience when adjusting for comorbidities, but moving from the inclusion of only the Part A inpatient claims (which included FFS traditional claims and MA shadow claims) to the inclusion of all inpatient claims (Part A and Part C). This had a small effect on the model results (details below).

The current production STTrR, SEDR, and ED30 includes only FFS patients and comorbidities based on all traditional FFS claim types (Parts A and B IP, OP, HH, HS, SNF, PS). With the new availability of Part C MA claims, we are able to include MA patients in these measures. The comorbidity adjustments in the SEDR and ED30 are now applied to both FFS and MA patients using all FFS traditional and MA claims (Part A, B, and C). The STTrR measure had the most significant model changes since the inclusion of Part C inpatient

and outpatient data necessitated a change to the current comorbidity exclusion approach. The details are presented below for each measure.

Comparison of MA and FFS Comorbidity Ascertainment

The SHR and SMR measures use the same set of prevalent comorbidities and apply them in a similar way in their respective analytical models. These two measures use claims from a single prior calendar year to identify 91 prevalent comorbidities for each patient and adjust for these comorbidities in the models for the following calendar year. We used these comorbidities to analyze patient population and comorbidity prevalence rates for MA and FFS patients in the 2022 look-back period.

Using a base model of 2023, with 2022 as the look-back period, the study population included patients alive as of 12/31/2022, on dialysis and with at least 90 days since their first ESRD service in 2022 and at least six months of Medicare coverage (FFS and/or MA) in 2022. Medicare Advantage (MA) status or FFS status for each patient month during 2022 was determined using payment history data. Patients were classified as either MA for at least 6 months in 2022 or as FFS for at least 6 months with no months identified as MA during the year. Data for the comorbidities were based on 2022 inpatient and outpatient claims including all Part C claims and FFS claims. In current production models, only FFS inpatient claims and MA shadow inpatient claims are used to identify prevalent comorbidities. Here, we assessed how a change to including all claims for MA and FFS may impact the model adjustments.

Table 1 below shows demographics for the patient population by Medicare insurance type. We calculated the prevalence of each of the 91 comorbidities conditions within each insurance group. Many of the 91 comorbidities conditions considered are fairly uncommon (<5%) and the prevalence is similar for MA and FFS patients. Among the more common comorbidities (Table 2) there are some larger differences in prevalence and in most cases, the prevalence is higher for the MA patients than FFS. For instance, for the most common comorbidities (those with >10% prevalence overall), the prevalence among MA patients is higher in 11 out of the 16 most prevalent comorbidities. Also, among the 12 comorbidities with a difference of >1 percentage point between the FFS and MA prevalence, FFS has higher prevalence in only 2 cases. For comorbidities reported per patient, on average MA patients have 5.7 of the 91 comorbidities reported compared to 5.4 reported for FFS patients.

Table 1. Descriptive Statistics for Fee for Service and Medicare Advantage Patients (2022)

For claims year 2022	FFS (at least 6 months) (N=171,469)	MA (at least 6 months) (N=176,875)
Mean:		
Average age	63.9	66.9
Average ESRD dialysis vintage	5.4	4.4
Patients Characteristics*	%	%
Race		
American Indian/Alaska Native	1.8	0.6
Asian	5.6	4.9
Black or African American	30.7	40.1
White	60.0	53.0
Native Hawaiian or Pacific Islander	1.3	1.1

For claims year 2022	FFS (at least 6 months) (N=171,469)	MA (at least 6 months) (N=176,875)
Gender		
Female	42.3	44.5
Male	57.7	55.5
Ethnicity		
Hispanic	16.5	21.0
Non-Hispanic	83.4	79.0
Age		
18-39	6.5	3.0
40-64	38.8	33.4
65-74	29.5	34.3
75+	25.0	29.3
Modality		
Hemodialysis	85.5	87.6
Peritoneal dialysis	13.6	11.9
Years since start of ESRD		
< 1	10.2	14.6
1-2	26.4	32.6
2-3	12.2	11.4
3-6	23.5	20.3
6+	27.8	21.2

*Column percentage reported

Table 2: Prevalence of Selected Comorbidities for FFS and Medicare Advantage Groups (2022)
Ordered by prevalence among the Medicare Advantage group

CCS Group	CCS Description	Among FFS Prevalence %	Among MA 6+ Prevalence %
16	Diabetes with complications	69.2	75.6
15	Diabetes without complications	47.6	51.3
88	Long-term (current) use of insulin	38.2	42.3
56	Peripheral and Visceral Atherosclerosis	27.7	33.8
64	Respiratory Failure	25.2	26.8
61	Asthma	21.4	26.6
52	Atrial fibrillation	27.1	25.9
37	Major depressive affective disorder	19.5	19.1
22	Morbid Obesity	15.5	17.6
70	Chronic Skin Ulcer	17.2	16.6
45	Coronary Atherosclerosis	14.3	16.2
60	Chronic Obstructive Pulmonary Disease	13.2	15.5
48	Pulmonary Heart Disease	13.7	14.1
49	Cardiomyopathy	13.6	13.2
44	Myocardial Infarction	11.7	12.7

CCS Group	CCS Description	Among FFS Prevalence %	Among MA 6+ Prevalence %
18	Malnutrition / Cachexia	14.1	11.0

Standardized Hospitalization Ratio (SHR)

The Standardized Hospital Ratio (SHR) assesses a facility's hospitalization rates compared to what would be expected given the characteristics of its patient population. The current SHR model includes all Medicare patients – both FFS and MA. The outcome (inpatient hospitalization) is based on inpatient claims from Part A, which include shadow claims for most MA patients. A small fraction of hospitals don't have incentives to submit shadow claims. We subsequently merged Part C inpatient encounters to address this limitation of the shadow claims. The model includes an adjustment for the proportion of each analysis period during which the patient is MA. The model also adjusts for 91 prevalent comorbidities which are identified from the Part A inpatient claims.

Methods and suggested changes

For SHR, we propose to use all claim types to identify prevalent comorbidities to use as adjustments, instead of the current method's use of only inpatient claims from Part A. Additionally, we evaluated a more direct way to control for MA coverage, using a time dependent adjustment for MA (yes/no). We are in the process of looking at whether the Part C inpatient claims include hospitalizations not in the Part A shadow claims in order to decide whether to change the method for identifying hospitalization events.

Test #1: Include all claim types in the prevalent comorbidity adjustments, instead of only Part A inpatient claims.

Test #2: Change the Medicare Advantage adjustment from proportion of the period at risk to a time dependent binary variable. The models in Test #2 change only the MA adjustment approach, with both models using all claim types for the prevalent comorbidity adjustment.

Test #3 (In progress – results not available): For identifying hospitalization events, include Part C inpatient claims in addition to the Part A claims. NOTE: Because Part A inpatient claims include both FFS inpatient claims and shadow inpatient claims for MA patients, we expect this will add very few hospitalization events.

Results

Impact on Comorbidity Ascertainment

Table 3 below compares the prevalence of comorbidities in the current SHR production model which uses Part A inpatient claims for comorbidity identification to the test model which uses all claim types for FFS and MA patients. As expected, the comorbidity rate is higher when all claim types are considered. Note that this review differs from the comparison described above. Here, we include all patients (FFS and MA) in the model whereas above we required 6 months of claims to be present for inclusion. As such, the prevalence of comorbidities is higher in the prior analysis due to this claim history requirement.

Table 3: Comparison of Prevalent Comorbidities by Part A inpatient claims (current model) and all FFS and MA claim types (test model), 2023 (N=1,273,357)

CCS Group	CCS Description	Comorbidity Percentage by Analysis Period, 2023		
		Current Model (Part A claims)	Test Model (All claims for FFS and MA)	Absolute Difference in Comorbidity Rate
1	Candidal esophagitis	0.17	0.22	0.05
2	Sarcoidosis	0.23	0.36	0.13
3	Cancer of Liver	0.14	0.27	0.13
4	Cancer of Lung	0.25	0.56	0.31
5	Cancer of Prostate	0.33	1.55	1.22
6	Cancer of Bladder	0.13	0.45	0.32
7	Cancer of Kidney	0.37	1.12	0.75
8	Cancer of Bone	0.14	0.32	0.17
9	Other Neoplasm	0.05	0.38	0.33
10	Non-Hodgkin's Lymphoma	0.11	0.24	0.13
11	Multiple Myeloma	0.39	0.77	0.37
12	Chronic lymphoid leukemia	0.08	0.15	0.07
13	Myelodysplastic Syndrome	0.17	0.41	0.24
14	Essential Thrombocytopenia	0.03	0.14	0.11
15	Diabetes without complications	9.28	30.91	21.63
16	Diabetes with complications	26.70	43.00	16.30
17	Glucocorticoid deficiency	0.45	0.58	0.12
18	Malnutrition / Cachexia	3.80	7.52	3.72
19	Disorders of urea cycle metabolism	0.19	0.29	0.10
20	Other amyloidosis	0.18	0.33	0.14
21	Other specified disorders of metabolism	0.47	1.00	0.53
22	Morbid Obesity	6.30	10.54	4.24
23	Sickle-cell Anemia	0.09	0.16	0.07
24	Pancytopenia	1.75	2.27	0.52
25	Neutropenia	0.24	0.49	0.25
26	Primary hypercoagulable state	0.52	0.85	0.33
27	Dementia	2.61	4.10	1.49
28	Substance Related Disorders	0.14	0.29	0.14
29	Miscellaneous Mental Health	0.02	0.11	0.08
30	Opioid Dependence	0.67	1.39	0.71
31	Schizophrenia	0.31	0.56	0.25
32	Cerebral degeneration, unspecified	0.11	0.58	0.46
33	Peripheral autonomic neuropathy in disorders classified elsewhere	0.00	0.11	0.10

		Comorbidity Percentage by Analysis Period, 2023		
CCS Group	CCS Description	Current Model (Part A claims)	Test Model (All claims for FFS and MA)	Absolute Difference in Comorbidity Rate
34	Unspecified hereditary and idiopathic peripheral neuropathy	0.05	0.70	0.65
35	Epilepsy	2.90	4.39	1.49
36	Bipolar Disorder	0.88	1.39	0.51
37	Major depressive affective disorder	7.35	12.16	4.81
38	Mood Disorders	0.56	1.02	0.46
39	Alcohol Related Disorders	0.40	0.79	0.38
40	Coma	0.33	0.58	0.25
41	Cerebral edema	0.22	0.27	0.04
42	Critical illness myopathy	0.50	0.67	0.17
43	Hypertensive heart disease with heart failure	1.07	5.12	4.05
44	Myocardial Infarction	5.90	7.81	1.91
45	Coronary Atherosclerosis	5.08	9.52	4.44
46	Pulmonary embolism and infarction	0.52	1.21	0.69
47	Primary pulmonary hypertension	0.03	0.40	0.37
48	Pulmonary Heart Disease	5.78	8.44	2.66
49	Cardiomyopathy	4.95	8.07	3.12
50	Atrioventricular block, complete	0.60	1.08	0.48
51	Paroxysmal Tachycardia	1.76	2.54	0.77
52	Atrial fibrillation	10.40	15.43	5.02
53	Atrial flutter	1.86	2.83	0.97
54	Sinoatrial node dysfunction	2.97	6.20	3.24
55	Acute Cerebrovascular Disease	1.51	5.30	3.79
56	Peripheral and Visceral Atherosclerosis	4.20	17.97	13.76
57	Aortic and Peripheral Artery Aneurysm	0.45	0.90	0.45
58	Venous Thromboembolism	1.81	2.88	1.07
59	Esophageal varices	0.17	0.24	0.07
60	Chronic Obstructive Pulmonary Disease	8.24	9.38	1.14
61	Asthma	7.11	14.82	7.71
62	Aspiration Pneumonitis	1.58	1.85	0.27
63	Other Lower Respiratory Diseases	3.51	4.73	1.22
64	Respiratory Failure	14.04	16.65	2.60
65	Enteritis and Ulcerative Colitis	0.30	0.53	0.23
66	Ileus and Intestinal Obstruction	1.27	1.93	0.65

		Comorbidity Percentage by Analysis Period, 2023		
CCS Group	CCS Description	Current Model (Part A claims)	Test Model (All claims for FFS and MA)	Absolute Difference in Comorbidity Rate
67	Cirrhosis of Liver	1.87	2.91	1.04
68	Other Liver Disease	0.88	1.25	0.37
69	Pancreatitis	0.44	0.67	0.22
70	Chronic Skin Ulcer	5.05	10.30	5.25
71	Systemic lupus erythematosus and connective tissue disorders	0.78	1.23	0.45
72	Infective arthritis and osteomyelitis	2.02	3.63	1.61
73	Rheumatoid Arthritis	0.85	1.53	0.68
74	Pathologic Fracture	0.37	0.54	0.17
75	Aseptic Necrosis	0.10	0.30	0.19
76	Hip and Femur Fracture	0.36	1.08	0.71
77	Gangrene	2.29	3.35	1.05
78	Infection due to urinary catheter	0.49	0.59	0.10
79	HIV	0.36	0.60	0.25
80	Solid Organ Transplant	0.52	0.76	0.24
81	Gastrostomy status	0.48	0.78	0.30
82	Ileostomy / Colostomy Status	0.57	0.87	0.30
83	Other artificial opening of urinary tract status	0.18	0.34	0.16
84	Dependence on respirator, status	0.25	0.92	0.67
85	Other toe(s) amputation status	1.20	2.68	1.48
86	Below knee amputation status	1.73	2.77	1.04
87	Above knee amputation status	0.58	0.98	0.41
88	Long-term (current) use of insulin	14.81	25.12	10.32
89	Cancer of Rectum	0.03	0.12	0.09
90	Inflammatory polyarthropathy	0.05	0.20	0.15
91	Sacroiliitis	0.03	0.46	0.43

Impact on measure specifications and risk adjustment

Test #1

Table 4 below presents the facility comparison between the current production model (comorbidities from Part A claims) and test model which pulls prevalent comorbidity adjustments from all claim types.

Table 4. Comparison of facility categories between production model (comorbidities from Part A only) and test model (comorbidities from all claim types), 2023 (N=7,511)¹

	Test Model (Includes comorbidities from all FFS and MA claims)		
Current Model	Better than Expected	As Expected	Worse than Expected
Better than Expected	75 (1.0%)	23 (0.3%)	0 (0.0%)
As Expected	15 (0.2%)	7,006 (93.3%)	40 (0.5%)
Worse than Expected	0 (0.0%)	44 (0.6%)	308 (4.1%)

¹ Restricted to facilities with > 5 patient-years at risk

The inclusion of additional claim types for comorbidity ascertainment does not notably alter the SHR model results. The table shows only 1.6% of the 7,511 facilities have a change in the facility categories group.

Test #2

This next test reviews the change for the Medicare Advantage adjustment from proportion of the period at risk to a time dependent binary variable. Both models being tested include using all claim types for comorbidity ascertainment. Tables 5 and 6 below show that the estimate for the new covariate is nearly identical to the original covariate and the facility categories changes very little, respectively.

Table 5. Comparison of proportional and binary MA covariates in SHR model, 2023

Parameter	Estimate	Standard Error	P-value
Proportional MA covariate	-0.158	0.00318	<.0001
Binary MA covariate	-0.153	0.00312	<.0001

Table 6. Comparison of facility categories between the Proportional MA model and the binary MA covariate, 2022-2023 (N=7,511)¹

	Binary MA Model		
Proportional MA Model	Better than Expected	As Expected	Worse than Expected
Better than Expected	88 (1.2%)	2 (0.03%)	0 (0.0%)
As Expected	0 (0.0%)	7,072 (94.2%)	1 (0.01%)
Worse than Expected	0 (0.0%)	3 (0.04%)	345 (4.6%)

¹ Restricted to facilities with > 5 patient-years at risk

The two tests show the inclusion of additional claims to assess prevalent comorbidities and the switch to a time-dependent MA indicator does not modify SHR model results significantly when compared to the production model. In Test #2, the new time-dependent binary MA variable results were unchanged in the facility categories table over 99% of the time when compared to the model which uses the proportional MA variable.

Standardized Mortality Ratio (SMR)

The current production SMR includes all Medicare patients – both FFS and MA. The measure compares a facility's observed death rate to the expected death rate based on national averages and patient

characteristics. The measure includes an adjustment for the proportion of each analysis period during which the patient is MA. The model also adjusts for 91 prevalent comorbidities which are identified from the Part A inpatient claims.

Methods and suggested changes

Test #1: Similar to SHR, we tested the effect of identifying comorbidities using all claim types for FFS and MA rather than using only inpatient claims from Part A. Table 3, in the SHR section, is applicable here and shows the difference in comorbidity rates by the current production and test models.

Concurrently, we also tested the change of the Medicare Advantage adjustment from a proportion of the period at risk to a binary indicator variable as discussed above. In order to make this update, we split the time at risk for each patient, which increases the number of records that are included in the data for the model, but the number of patients and actual time at risk remains unchanged.

Results

Impact on measure specifications and risk adjustment models

As with the SHR results, the expansion of comorbidity source from only Part A claims to all claims did not notably impact the model results. Nor did the change from the proportional to the binary MA covariate impact the SMR model results. The following tables compare the current production model to the test model. Here, the test model incorporates both the expansion of the comorbidity adjustment to all claim types for MA and FFS. The test model also modifies the Medicare Advantage adjustment from the proportional to the binary MA covariate.

Table 7 below shows the MA covariates estimate and significance for the current model (proportional MA covariate with only Part A claims for comorbidities) and the test model (binary MA covariate with all FFS and MA claims for comorbidities) are very similar. As with the MA covariates, the facility categories table (Table 8) also shows facilities have nearly identical results when moving from the current model to the test model.

Table 7. Comparison of estimates for MA adjustment in current production model with proportional MA covariate and comorbidities from Part A only, to the test model with comorbidities from all claim types and binary MA covariate in SMR model, 2022-2023

Parameter	Estimate	Standard Error	P-value
Proportional MA covariate	-0.0649	0.0055	<.0001
Binary MA covariate	-0.0656	0.0055	<.0001

Table 8. Comparison of facility categories between the current production model (Part A only for comorbidities) and test model which pulls prevalent comorbidity information from all claim types, and includes a binary MA covariate, 2022-2023 (N=7,510)¹

	Binary MA Model (Includes comorbidities from all FFS and MA claim types)		
	Better than Expected	As Expected	Worse than Expected
Proportional MA Model			
Better than Expected	144 (1.92%)	46 (0.61%)	0 (0.0%)

As Expected	30 (0.40%)	7,047 (93.83%)	30 (0.40%)
Worse than Expected	0 (0.0%)	26 (0.35%)	187 (2.49%)

¹ Restricted to facilities with at least 3 expected deaths

Standardized Readmission Ratio (SRR)

The Standardized Readmission Ratio (SRR) measures the observed number of unplanned readmissions within 4-30 days of a hospital discharge to an expected number based on national norms and patient characteristics. The SRR includes all FFS and MA patients with an eligible Medicare hospitalization. Part A inpatient claims (which include shadow claims for MA patients) are used to identify index discharges, readmissions, and comorbidities for adjustment.

Methods and suggested changes

Test #1: Incorporate Part C inpatient claims into the process of identifying prevalent comorbidity diagnoses in the 365 days before the start of an index discharge.

Test #2 (in progress – results not available): For identifying index discharges and readmissions, include Part C inpatient claims in addition to the Part A claims.

Results

Impact on measure specifications and risk adjustment models

Incorporating Part C inpatient claims into the process of identifying prevalent comorbidity diagnoses increases the number of comorbidities identified only slightly (<1 increase, Table 9). This is because the Part A inpatient claims include shadow claims for MA patient inpatient stays. Fifty-one (0.7%) facilities' performance classification shifted by one category with this change, as seen in the facility categories table (Table 10) below. Overall, 99.3% of the facilities remain in the same category in both the production and test models.

Table 9. Comparison of comorbidities included in current SRR model and test model, 2023

	Current Model	Test Model	% difference
Total Comorbidities	6,832,283	6,891,264	0.86

Table 10. Facility Categories Table for SRR Comorbidity Source Comparison, 2023

Production Model	Test Model (Inclusion of Part C inpatient claims for comorbidities)		
	Worse than Expected	As Expected	Better than Expected
Worse than Expected	109 (1.5%)	13 (0.2%)	0 (0.0%)
As Expected	9 (0.1%)	6818 (94.5%)	15 (0.2%)
Better than Expected	0 (0.0%)	14 (0.2%)	233 (3.2%)

Standardized Emergency Department Ratio (SEDR)

The current SEDR is defined as the ratio of the observed to the expected number of emergency department (ED) encounters that occur for Medicare FFS dialysis patients (MA patients are not included). Emergency department encounters currently are identified from Part B outpatient claims. Prevalent comorbidities for model adjustments are identified using all claim sources (Part A and Part B) for traditional FFS.

Methods and suggested changes

Test #1: Include Medicare Advantage patient time at risk and ED visit encounters from Part C outpatient claims. In addition, include all Part C claims for prevalent comorbidity adjustment. Create a time dependent covariate which identifies when a patient is part of a traditional FFS plan or a Medicare Advantage plan. As in the SMR and SHR models, time at risk is split by Medicare Advantage status and the model includes a binary Medicare Advantage indicator. Because we are adding MA patients and encounters, we expect a notable increase in ED time at risk and events.

Results

Impact on time at risk and observed events

Table 11 below shows the increase in overall patient-months at risk (2021-2023) with the addition of MA patients. MA patient-months have higher ED rates than what is observed for the FFS patient-months.

Table 11. Comparison of patient years-at-risk, ED events and Observed ED rates by Medicare Advantage Status, 2023

	Overall	Non-MA	MA
Total Patient-Years at Risk, US 2023	362,292	164,383 (45.4%)	197,909 (54.6%)
Total ED Events, US 2023	560,574	225,643 (40.3%)	334,931 (59.7%)
Observed ED Rate	1.55	1.37	1.69

Impact on measure specifications and risk adjustment models

This test model includes Medicare Advantage patient time at risk and ED visit encounters from Part C outpatient claims, as well as all Part C claims for the prevalent comorbidity adjustment. Additionally, it splits the time at risk by FFS or MA and includes a binary MA covariate. This model is compared the current production model. The parameter estimates (2023) for the binary MA covariate in Table 12 shows that Medicare Advantage patients have significantly higher rates of ED encounters than FFS patients, all things being equal.

Table 12. Binary MA covariate in SEDR model, 2023

Parameter	Estimate	Standard Error	P-value
Binary MA covariate	0.12698	0.00214	<.0001

Additionally, including a time dependent adjustment for MA status in the model and comorbidities that include Part C claims results in a change in facility categories group for about only 7% of facilities (Table 13).

Table 13. Comparison of facility categories between current production model and binary MA test model, 2023 (N=7,106)¹

Current Model	Binary MA Model (MA claims included for time at risk, ED encounters and comorbidities with binary indicator)		
	Better than Expected	As Expected	Worse than Expected
Better than Expected	17 (0.2%)	13 (0.2%)	0 (0.0%)
As Expected	37 (0.5%)	6,455 (90.8%)	158 (2.2%)
Worse than Expected	0 (0.0%)	247 (3.5%)	179 (2.5%)

¹ Restricted to facilities with > 5 patient-years at risk

Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30)

The ED30 measure is defined as the ratio of the observed to expected ED encounter within 30 days of an inpatient discharge and is restricted to FFS patients. The numerator is the observed number of discharges from acute care hospitals that are followed by an outpatient emergency department encounter within 4-30 days after discharge for eligible adult Medicare dialysis patients treated at a particular dialysis facility. The denominator is the expected number of index discharges followed by an ED encounter within 4-30 days given the discharging hospital's characteristics, characteristics of the dialysis facility's patients, and the national norm for dialysis facilities. Emergency department encounters currently are identified from Part B outpatient claims and index discharges are from Part A claims. The ED30 measure excludes any index discharges if the patient is on MA during the month of start date of the index discharge. Prevalent comorbidities for current model adjustments are identified using all claim sources (Part A and Part B) for traditional FFS.

Methods and suggested changes

Test #1: Include Medicare Advantage patients in test model. Part C outpatient claims identify ED encounters 4-30 days after index discharge for MA patients. Part A shadow claims identify most index discharges from MA patients in test model. The model includes a binary adjustment that indicates if patient is on MA during the month of the start date of the index discharge. In addition, the test model includes all claims for prevalent comorbidity adjustment.

Test #2: (future) Include MA index discharges. We do not expect to see a significant change in model results since most of these index discharges would be already found as Part A shadow claims.

Results

Impact on index discharges and observed ED events

Table 14 below shows the number of index discharges and ED events overall and separately for the non-MA and MA patients. The rate of ED encounters within 30 days of hospital discharge is higher for MA patients than non-MA patients.

Table 14. Comparison of index discharges, ED encounters within 4-30 days following an index discharge, and ED encounter rate by MA status, 2022-23

	Overall	Non-MA	MA
Total Index Discharges	802,399	410,824 (51.2%)	391,575 (48.8%)
Total ED Encounters	125,970	58,331 (46.3%)	67,639 (53.7%)
ED Encounter Rate	0.157	0.142	0.173

Impact on measure specifications and risk adjustment models

The inclusion of Part C data for ED patient time-at-risk, ED events and comorbidity ascertainment for the ED30 model results in more than doubling of index discharges and ED encounters. There are 6% of facilities that change facility categories compared to the current production model. We are currently considering adding MA index discharges from Part C. See Tables 15 and 16 for details.

Table 15. Comparison of observed and expected events between current production ED30 model and test model #1, 2022-2023

	Current Model	Test Model	% Difference
Total Index Discharges	410,824	802,399	95.3
Total ED Encounters	58,331	125,970	116.0
ED Encounter Rate	0.142	0.157	10.6
Total Expected ED Encounters	55,997	124,455	122.2
Expected ED Encounter Rate	0.136	0.155	13.8
ED30 Ratio	1.04	1.01	-2.8

Table 16. Comparison of facility categories between current production ED30 model and test model #1, 2022-2023

Current Model	Test Model (Includes MA ED events and MA comorbidities from Part C)		
	Better than Expected	As Expected	Worse than Expected
Better than Expected	50 (0.7%)	80 (1.1%)	0 (0.0%)
As Expected	99 (1.4%)	6464 (91.9%)	105 (1.5%)
Worse than Expected	0 (0.0%)	144 (2.0%)	94 (1.3%)

Standardized Transfusion Ratio (STrR)

The Standardized Transfusion Ratio (STrR) is used to monitor the risk-adjusted transfusion rate at the dialysis facility level, relative to a national standard, and it allows for detection of differences in dialysis facility anemia treatment patterns.

Because the intention behind the measure is to detect the possibility of underutilization of alternatives to transfusion, patients' time at risk and transfusion events are not included if they occur within one year of diagnoses contraindicating the use of ESAs. In particular, patients' time at risk is excluded beginning with a Medicare claim for hemolytic or aplastic anemia, solid organ cancer, lymphoma, carcinoma in situ, coagulation disorders, multiple myeloma, myelodysplastic syndrome and myelofibrosis, leukemia, head and neck cancer, other cancers (connective tissues, skin, and others), metastatic cancer, and sickle cell anemia. Once a patient is diagnosed with one of these comorbidities, a patient's time at risk is included only after a full year free of claims that list any diagnosis on the exclusions list.

As with the hospitalization statistics, the STrR measure includes only patients whose FFS Medicare claims include all transfusions for the period. To achieve this goal, we require that patients reach a certain level of Medicare-paid dialysis claims to be included in transfusion statistics, or that patients have Medicare inpatient claims during the period. For the purpose of analysis, each patient's follow-up time is broken into periods defined by time since dialysis initiation. For each patient, months within a given period are included if that month in the period is considered 'eligible;' a month is deemed eligible if it is within two months of a month having at least \$1,200 of Medicare-paid dialysis claims or at least one Medicare inpatient claim.

As mentioned above, STrR relies heavily on Medicare claims (Part A and Part B) to identify transfusion events, obtain prevalent comorbidities for exclusion, and determine the Medicare-eligible patient time at risk. To ensure completeness of information on transfusions for all patients included in the years at risk, months identified as having Medicare Advantage coverage, according to the Medicare Enrollment Database (EDB), were excluded in the current STrR measure.

Methods and suggested changes

In the existing STrR measure, over 54% of patient months (before comorbidity exclusion) are excluded from transfusion statistics for 2023 due to MA coverage. After applying the rule excluding facilities with fewer than 11 patient-years at risk, only 5,084 facilities had STrR values reported in 2023. For the 2025 measure maintenance reevaluation cycle, we explored the possibility of including MA patients in the STrR using Part C encounter data in the same manner as Medicare claims are used for Fee-For-Service (FFS) patients.

Transfusion Events

Our method for counting transfusion events relies on a conservative counting algorithm and, because of the way transfusion information is reported in Medicare claims, we use different rules for counting transfusion events, depending on whether or not the event occurs in the inpatient setting, or an outpatient setting.

As shown in Table 17, the percentages of inpatient claims with transfusion events from Part A versus Part C inpatient claims are similar, at 23.7% and 24.0%, respectively. Similarly, the percentages of outpatient claims with transfusion events from Part B versus Part C outpatient claims are close, at 0.6% and 0.5%.

Table 17: Comparison of identifying transfusion events using Part C encounter data versus Medicare Part A (inpatient) and Part B (outpatient) claims for all dialysis patients, applying the same algorithm.

	2023 Inpatient Claims	
	PART A	PART C
All claims (N)	1,128,552	466,826
Claims with Transfusion (N)	267,293	111,943
% claims with Transfusion	23.7%	24.0%

	2023 Outpatient Claims	
	PART B	PART C
All claims (N)	6,962,862	7,613,037
Claims with Transfusion (N)	39,731	35,859
% claims with Transfusion	0.6%	0.5%

Comorbidity Exclusions

Table 18 shows 17% of patients and 24% of patient months at risk were excluded for FFS patients due to 11 comorbidities identified from Medicare Part A and B claims. In comparison, 21% of patients and 30% of patient months at risk were excluded for Medicare Advantage (MA) patients due to comorbidities identified from Part C encounter claims. MA patients have a higher rate of exclusion compared to FFS patients.

Table 18: Comparison of overall comorbidity exclusion rates for FFS, MA and all (FFS + MA) patients with time at risk for transfusions in 2023

Patient Medicare status:	FFS	MA	FFS+MA
Claim source for exclusion:	Parts A and B claims	Part C encounter claims	All claims
Number of unique patients before comorbidity exclusion:	240,232	261,880	473,762
Number of patients after comorbidity exclusions:	199,634	206,384	367,228
Number of patients excluded:	40,598	55,496	106,534
Percentage of patients excluded:	17%	21%	22%
Patient months before exclusions:	2,196,502	2,642,059	4,838,561
Patient months after exclusions:	1,660,313	1,849,452	3,337,270
Number of patient months excluded:	536,189	792,607	1,498,336
Percentage of patient months excluded:	24%	30%	31%

We further broke down the exclusions by individual comorbidity in Table 19 and found that coagulation is the only one that showed a significant difference in the percentage of patient-months excluded between FFS and MA patients, at 8% for FFS and 22% for MA.

Table 19: Comparison of individual exclusion comorbidity rates for FFS, MA and all (FFS + MA) patients with time at risk for transfusions in 2023

Patient Medicare status:	FFS		MA	
Number of patient months:	2,196,502		2,642,059	
Claim source for exclusion:	Part A and B claims		Part C encounter claims	
Comorbidities	Count	Percent	Count	Percent
CARCINOMA	15,421	0.7%	15,284	0.6%
COAGULATION	176,708	8.0%	591,200	22.4%
HEAD_NECK_CANCER	8,389	0.4%	8,819	0.3%
HEMOLYTIC_APLASTIC	124,955	5.7%	127,830	4.8%
LEUKEMIA	19,395	0.9%	18,005	0.7%
LYMPHOMA	21,800	1.0%	18,518	0.7%
METASTATIC	46,491	2.1%	45,052	1.7%
MYELOMA_ETC	78,073	3.6%	80,735	3.1%
OTHER_CANCER	15,124	0.7%	13,961	0.5%
SICKLECELL	6,296	0.3%	7,849	0.3%
SOLIDORGAN_CANCER	260,189	11.9%	264,391	10.0%

Recommended changes to methods

Based on the investigations above, we recommended the following changes for STrR:

1. Since over 54% of patient months at risk in 2023 were excluded from transfusion statistics due to the exclusion of patient time with MA coverage, and since MA patients have a similar method for identifying transfusion events and obtaining prevalent comorbidities for exclusion using Part C encounter data as FFS patients do using Medicare institute and physician/supplier claims, we recommend that MA patients be included in the STrR measure. Each patient's follow-up time is broken into periods defined by MA status and an indicator of MA (yes or no) is added to each period and will be adjusted in the Stage 1 model.
2. Since 22% of patients and 31% of patient months at risk were excluded after applying the current comorbidity exclusion for FFS and MA patients, and there is no significant change in the percentage of ESA administration among patient months remaining or excluded after comorbidity exclusion (68.8% for those included vs. 67.2% for excluded, as shown in Table 20 below), we propose that instead of excluding the patient time with comorbidities in the one-year look-back period, we keep the patient time and add an indicator to see if there is any claim for each comorbidity in the one-year look-back period prior to each observation window. As coagulation shows a significant difference in the percentage of exclusion between FFS and MA patients, we create two indicators for coagulation, one from Part A and Part B and one from Part C encounter claims. Additionally, we will add an indicator for at least 6 months of Medicare FFS or Medicare Advantage coverage during the past 12 months from the beginning of each patient time period. Those indicators will be included as adjustments in the Stage 1 model.

Table 20. Comparison of ESA use among patient months included and excluded from the model.

	Total	ESA administrated	
		No	Yes
Number of patient months remaining after exclusions	3,337,270	1,048,423	2,288,847
		31.4%	68.8%
Number of patient months excluded	1,498,336	491,044	1,007,292
		32.8%	67.2%

3. We propose bridging overlapping claims for identifying transfusion events. We noticed that over 40% of claims had overlapping periods between Part C inpatient and Part A. This overlap is due to shadow claims for MA patients in Part A. To avoid over-counting transfusion events, we propose combining any transfusion claims with overlapping periods into a single claim, counting it as one transfusion event.

Results

Impact on observed events

Table 21 below shows the number of patients, patient years and observed transfusion events between the 2023 current and new STrR. The new STrR has significantly higher values for the three numbers due to the inclusion of MA patients and no comorbidity exclusion in the analysis.

Table 21. Comparison of number of patients, patient years and observed transfusion events between the 2023 current and new STrR.

	Current STrR	New STrR	Difference (%) between New and Old
Number of Patients	199,634	473,762	274,128 (137%)
Number of Patient Years	124,374.6	367,079.9	242,705.3 (195%)
Number of Transfusions	40,904	183,716	142,812 (349%)

Impact on measure specifications and risk adjustment models

Table 22 below shows the estimate and significance for 2023 current model and new model. As shown above, the patient time at risk in the new model are significantly higher. The MA indicator, an indicator for at least 6 months of Medicare FFS or Medicare Advantage coverage, 12 prevalent comorbidity indicators during the past 12 months are adjusted in the new model.

Table 22. Comparison the estimates between the 2023 current and new STrR.

Parameter	Current Model			New Model		
	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value
Age(18-24 years old)	0.41	0.069	<0.0001	0.416	0.038	<.0001
Age(25-44 years old)	0.255	0.023	<0.0001	0.224	0.011	<.0001

Parameter	Current Model			New Model		
	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value
Age(45-59 years old)	-0.006	0.02	0.766	0.024	0.009	0.007
Age(75 or older)	-0.047	0.021	0.022	-0.107	0.008	<.0001
Diabetes	0.002	0.057	0.977	-0.154	0.024	<.0001
Cause of ESRD Missing	0.23	0.209	0.272	0.052	0.110	0.636
Duration_of_ESRD*Diabetes(6 months-1 year)	0.081	0.067	0.231	0.117	0.029	<.0001
Duration_of_ESRD*Diabetes(1-2 years)	0.108	0.062	0.081	0.130	0.026	<.0001
Duration_of_ESRD*Diabetes(2-3 years)	0.094	0.063	0.133	0.163	0.027	<.0001
Duration_of_ESRD*Diabetes(3-5 years)	0.087	0.06	0.145	0.123	0.026	<.0001
Duration_of_ESRD*Diabetes(5+ years)	0.022	0.057	0.699	0.130	0.025	<.0001
Age*Diabetes(18-24 years old)	1.095	0.239	<0.0001	0.961	0.152	<.0001
Age*Diabetes(25-44 years old)	0.021	0.036	0.565	0.015	0.018	0.419
Age*Diabetes(45-59 years old)	0.056	0.028	0.045	0.000	0.013	0.971
Age*Diabetes(75 or older)	-0.026	0.03	0.391	0.019	0.013	0.131
Nursing Home <90 days in last year	0.564	0.018	<0.0001	0.391	0.007	<.0001
Nursing Home 90 days or more in last year	0.345	0.022	<0.0001	0.211	0.010	<.0001
Underweight	0.179	0.031	<0.0001	0.115	0.014	<.0001
Overweight	-0.058	0.015	<0.0001	-0.054	0.007	<.0001
Obese	-0.181	0.014	<0.0001	-0.170	0.006	<.0001
Incident Comorbidity: Atherosclerotic heart disease	0.016	0.02	0.429	0.052	0.009	<.0001
Incident Comorbidity: Other cardiac disease	0.026	0.017	0.12	0.040	0.007	<.0001
Incident Comorbidity: Congestive heart failure	0.038	0.014	0.009	0.027	0.006	<.0001
Incident Comorbidity: Inability to ambulate	0.057	0.035	0.098	0.050	0.015	0.001
Incident Comorbidity: Chronic obstructive pulmonary disease	0.219	0.024	<0.0001	0.174	0.010	<.0001
Incident Comorbidity: Inability to transfer	0.026	0.048	0.582	0.078	0.021	0.000
Incident Comorbidity: Malignant neoplasm, cancer	-0.012	0.037	0.739	-0.003	0.011	0.813
Incident Comorbidity: Diabetes (all types including cause of ESRD)	0.072	0.02	<0.0001	0.005	0.009	0.587
Incident Comorbidity: Peripheral vascular disease	0.14	0.022	<0.0001	0.084	0.010	<.0001
Incident Comorbidity: Cerebrovascular disease, CVA, TIA	0.023	0.021	0.283	-0.018	0.009	0.054
Incident Comorbidity: Tobacco use (current smoker)	0.252	0.022	<0.0001	0.172	0.010	<.0001
Incident Comorbidity: Alcohol dependence	0.102	0.049	0.037	0.174	0.020	<.0001

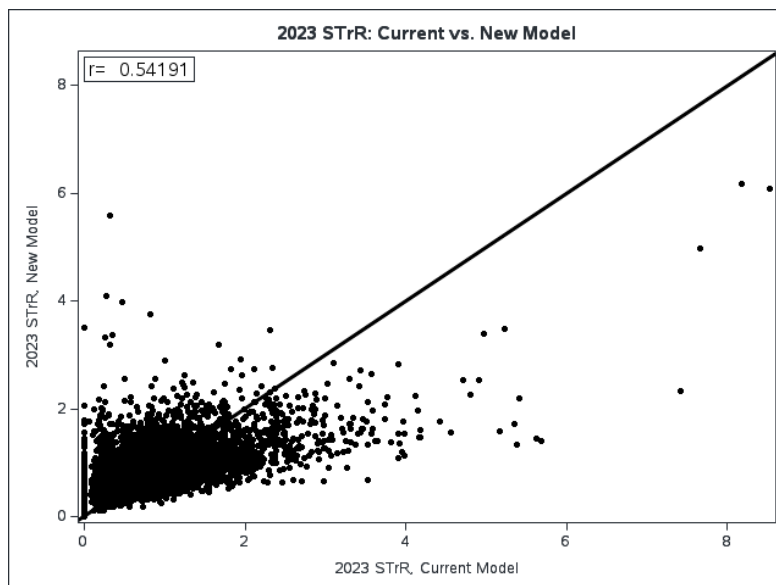
Parameter	Current Model			New Model		
	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value
Incident Comorbidity: Drug dependence	0.173	0.045	<0.0001	0.117	0.020	<.0001
Incident Comorbidity: At least one of the incident comorbidities listed	0.018	0.019	0.344	0.040	0.008	<.0001
Incident Comorbidity: No Medical Evidence (CMS-2728) Form	0.066	0.222	0.765	-0.138	0.114	0.229
Days 1-30 after the first COVID-19 diagnosis	1.303	0.034	<0.0001	1.385	0.016	<.0001
Days 31-60 after the first COVID-19 diagnosis	0.746	0.042	<0.0001	0.813	0.020	<.0001
> 60 days after the first COVID-19 diagnosis	0.234	0.012	<0.0001	0.223	0.005	<.0001
Medicare advantage coverage				-0.032	0.006	<.0001
Carcinoma in situ				0.069	0.026	0.009
Coagulation disorders (Part A,B)				0.456	0.009	<.0001
Coagulation disorders (Part C)				0.105	0.009	<.0001
Head and neck cancer				0.151	0.033	<.0001
Hemolytic or aplastic anemia				0.856	0.007	<.0001
Leukemia				0.385	0.020	<.0001
Lymphoma				0.228	0.020	<.0001
Metastatic cancer				0.542	0.014	<.0001
Multiple myeloma, myelodysplastic syndrome and myelofibrosis				0.645	0.010	<.0001
Other cancers				0.262	0.023	<.0001
Sickle cell anemia				1.528	0.019	<.0001
Solid organ cancer				0.281	0.008	<.0001
At least 6 months of Medicare FFS or Medicare Advantage coverage during the past 12 months				-0.070	0.011	<.0001

Table 23. Cross tab of current and new 2023 STrR facility categories table (restricted to facilities with > 10 patient-years at risk in current STrR) (N=5,084)

Current STrR	New STrR		
	Better than Expected	As Expected	Worse than Expected
Better than Expected	0 (0.0%)	4 (0.1%)	0 (0.0%)
As Expected	28 (0.6%)	4,492 (88.3%)	210 (4.1%)
Worse than Expected	0 (0.0%)	237 (4.7%)	113 (2.2%)

Among 5,084 facilities with current STrR reported, 4,605 (90.5%) facilities do not change ranking. 265 (5.3%) facilities increase their ranking, and 214 (4.2%) facilities decrease their ranking when using the new method (Table 23).

Figure 3. Scatterplot of 2023 facility STrR values: Current vs. New



Summary

As discussed above, we are proposing several changes to the SMR, SHR, SRR, SEDR, ED30, and STrR measures during the 2025 measure maintenance reevaluation cycle related to the new availability of MA Part C claims. Several analyses are still in progress in order to finalize decisions for each measure. We summarize these changes and the impact for each measure or set of measures below.

The updated measures all include MA patients. This represents a large change in the underlying population for the emergency department and transfusion measures (SEDR, ED30, and STrR) which currently are restricted to Medicare FFS patients. This change is possible due to the new availability of Part C claims that allows identification of ED visits and transfusions for MA patients. The addition of MA patients to the SEDR, ED30, and STrR requires that the updated models adjust for MA status. After evaluating the current adjustment in the SMR, SHR, and SRR, we decided that the updated SRR should continue to adjust for MA status at index discharge. This adjustment is also now included in the updated ED30 model. In the updated SMR and SHR models, we are moving to a slightly different method for adjusting for whether patients have MA or FFS Medicare coverage over time. The change has very little impact on the measures themselves but is easier to understand. This time dependent MA adjustment is also included in the updated SEDR and STrR models.

In adding the MA patients to the ED measures, we are able to use Part C claims to extend our current methods for identifying comorbidities and ED events among FFS patients directly to the MA population. ED events are identified from outpatient Part B claims for FFS patients and outpatient Part C claims for

MA patients, using the same set of codes. The updated models also adjust for the same set of claims-based comorbidities as the current models, with comorbidities for FFS patients coming from all Part A and B claims as before, and those for MA patients coming from all Part C claims.

For the updated STrR, we utilize all claims (Parts A, B, and C) for identifying comorbidities and transfusions, but the updated measure is not as direct of an extension of prior methods as for the ED measures. Specifically, for STrR, we are moving from a measure that handles comorbidities contraindicating the use of ESAs by exclusion to one that adjusts for these comorbidities. The method for counting transfusion events is also different.

Hospitalization events for the current SHR measure come from Part A inpatient claims. In the updated SHR we plan to also use Part C inpatient claims. Similarly, for index discharges in the updated ED30 and SRR and readmissions in the updated SRR, we plan to use Part C inpatient claims in addition to the Part A claims used in the current measures. These analyses are still in progress, but we expect the impact of this change to be quite small since our current method already captures most MA patient hospitalizations through the Part A shadow claims.

The updated SMR and SHR models include the same set of claims-based comorbidities as before, but rather than utilizing only inpatient claims, we use all Part A, B, and C claims. We continue to use only inpatient claims for identification of prevalent comorbidities for the updated SRR, but plan to incorporate Part C inpatient claims in addition to the Part A claims used in the current model. Again, this has a small effect on the SRR since the current method already captures MA patient information through shadow claims.

Appendix

Figure 4: Literature review details and included search terms

Search number		Query	Comment	Filters	Results	Search Details
25	MA AND chronic dialysis AND readmission	#17 AND #8				((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (hospital readmission[MeSH Major Topic]) AND (chronic dialysis)) AND (Medicare Advantage)
24	MA AND chronic dialysis AND ED utilization	#16 AND #8	Added to search #16			((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (emergency department visits OR emergency room visits OR emergency department utilization OR emergency room utilization) AND (chronic dialysis) AND (Medicare Advantage)
23	MA AND chronic dialysis AND mort/survival	#15 AND #8				((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (chronic dialysis) AND ((mortality[MeSH Major Topic]) OR (survival[MeSH Major Topic])) AND (Medicare Advantage)
22	MA AND chronic dialysis AND hosp	#14 AND #8	Added to search #12			((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (chronic dialysis) AND ((hospitalization[MeSH Major Topic]) OR (hospitalisation[MeSH Major Topic])) AND (Medicare Advantage)
21	MA and readmission	#2 AND #7 AND #8				26 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (hospital readmission[MeSH Major Topic]) AND (Medicare Advantage)
20	MA and ED utilization	#2 AND #6 AND #8				139 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (emergency department visits OR emergency room visits OR emergency department utilization OR emergency room utilization) AND (Medicare Advantage)
19	MA and mort/survival	#2 AND #8 AND #13				11 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (Medicare Advantage) AND ((mortality[MeSH Major Topic]) OR (survival[MeSH Major Topic]))
18	MA and hospitalization	#2 AND #8 AND #12				72 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (Medicare Advantage) AND ((hospitalization[MeSH Major Topic]) OR (hospitalisation[MeSH Major Topic]))
17	chronic dialysis AND readmission	#2 AND #7 AND #9				46 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (hospital readmission[MeSH Major Topic]) AND (chronic dialysis)
16	chronic dialysis AND ED utilization	#2 AND #6 AND #9	#24 merged; no new citations added			287 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (emergency department visits OR emergency room visits OR emergency department utilization OR emergency room utilization) AND (chronic dialysis)
15	chronic dialysis AND mort/survival	#2 AND #9 AND #13				172 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (chronic dialysis) AND ((mortality[MeSH Major Topic]) OR (survival[MeSH Major Topic]))
14	chronic dialysis AND hosp	#2 AND #9 AND #12	#22 added 1 citation			218 (((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type])))) AND (chronic dialysis) AND ((hospitalization[MeSH Major Topic]) OR (hospitalisation[MeSH Major Topic]))
13	mortality/survival	(mortality[MeSH Major Topic]) OR (survival[MeSH Major Topic])				76,066 "mortality"[MeSH Major Topic] OR "survival"[MeSH Major Topic]
12	hospitalization	(hospitalization[MeSH Major Topic]) OR (hospitalisation[MeSH Major Topic])				107,420 "hospitalization"[MeSH Major Topic]
9	chronic dialysis	chronic dialysis				93,526 ("chronic"[All Fields] OR "chronical"[All Fields] OR "chronically"[All Fields] OR "chronicities"[All Fields] OR "chronicity"[All Fields] OR "chronicization"[All Fields] OR "chronics"[All Fields]) AND ("dialysance"[All Fields] OR "dialysances"[All Fields] OR "dialysation"[All Fields] OR "dialysator"[All Fields] OR "dialysators"[All Fields] OR "dialyse"[All Fields] OR "dialysed"[All Fields] OR "dialyser"[All Fields] OR "dialysers"[All Fields] OR "dialysing"[All Fields] OR "dialysis solutions"[Pharmacological Action] OR "dialysis solutions"[MeSH Terms] OR "dialysis"[All Fields] AND "solutions"[All Fields]) OR "dialysis solutions"[All Fields] OR "dialysate"[All Fields] OR "dialysates"[All Fields] OR "dialyze"[All Fields] OR "dialyzates"[All Fields] OR "dialysis"[MeSH Terms] OR "dialysis"[All Fields] OR "dialyses"[All Fields] OR "dialyzability"[All Fields] OR "dialyzable"[All Fields] OR "dialyzation"[All Fields] OR "dialyce"[All Fields] OR "dialyzed"[All Fields] OR "dialyzer"[All Fields] OR "dialyzers"[All Fields] OR "dialyzing"[All Fields] OR "renal dialysis"[MeSH Terms] OR "renal"[All Fields] AND "dialysis"[All Fields]) OR "renal dialysis"[All Fields])
8	MA	Medicare Advantage				3,194 "medicare part c"[MeSH Terms] OR "medicare part c"[All Fields] OR ("medicare"[All Fields] AND "advantage"[All Fields]) OR "medicare advantage"[All Fields]
7	hospital readmission	hospital readmission[MeSH Major Topic]				11,960 "patient readmission"[MeSH Major Topic]
6	ED utilization	emergency department visits OR emergency room visits OR emergency department utilization OR emergency room utilization				163,310 "emergency room visits"[MeSH Terms] OR ("emergency"[All Fields] AND "room"[All Fields] AND "visits"[All Fields]) OR "emergency room visits"[All Fields] OR ("emergency"[All Fields] AND "department"[All Fields] AND "visits"[All Fields]) OR "emergency department visits"[All Fields] OR ("emergency room visits"[MeSH Terms] OR ("emergency"[All Fields] AND "room"[All Fields] AND "visits"[All Fields]) OR "emergency room visits"[All Fields]) OR ("emergency service, hospital"[MeSH Terms] OR ("emergency"[All Fields] AND "service"[All Fields] AND "hospital"[All Fields]) OR "hospital emergency service"[All Fields] OR "emergency department"[All Fields] AND "department"[All Fields]) OR "emergency department"[All Fields] AND ("statistics and numerical data"[MeSH Subheading] OR ("statistics"[All Fields] AND "numerical"[All Fields] AND "data"[All Fields]) OR "statistics and numerical data"[All Fields] OR "utilization"[All Fields] OR "utilisation"[All Fields] OR "utilisations"[All Fields] OR "utilise"[All Fields] OR "utilised"[All Fields] OR "utilizes"[All Fields] OR "utilising"[All Fields] OR "utilities"[All Fields] OR "utility"[All Fields] OR "utilizations"[All Fields] OR "utilize"[All Fields] OR "utilizers"[All Fields] OR "utilizes"[All Fields] OR "utilizing"[All Fields]) OR ("emergency service, hospital"[MeSH Terms] OR ("emergency"[All Fields] AND "service"[All Fields] AND "hospital"[All Fields]) OR "hospital emergency service"[All Fields] OR "emergency department"[All Fields] AND "department"[All Fields]) OR "emergency department"[All Fields] AND ("statistics and numerical data"[MeSH Subheading] OR ("statistics"[All Fields] AND "numerical"[All Fields] AND "data"[All Fields]) OR "statistics and numerical data"[All Fields] OR "utilization"[All Fields] OR "utilisation"[All Fields] OR "utilisations"[All Fields] OR "utilise"[All Fields] OR "utilised"[All Fields] OR "utilizes"[All Fields] OR "utilising"[All Fields]) OR "utilising"[All Fields] OR "utilities"[All Fields] OR "utility"[All Fields] OR "utilizations"[All Fields] OR "utilize"[All Fields] OR "utilized"[All Fields] OR "utilizer"[All Fields] OR "utilizers"[All Fields] OR "utilizes"[All Fields] OR "utilizing"[All Fields])
2	date/language/pub type exclusions	((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type]))))			3,364,996	((("2017/01/01"[Date - Publication] : "3000"[Date - Publication])) AND (English[Language]) AND (human study) NOT (animal NOT human[MeSH Subheading])) NOT (((("case reports"[Publication Type]) OR ("clinical trial, veterinary"[Publication Type]) OR ("expression of concern"[Publication Type]) OR ("letter"[Publication Type])) OR ("observational study, veterinary"[Publication Type]) OR ("patient education handout"[Publication Type]))))