



2022 Qualified Entity Public Report Michigan Value Collaborative / Regents of the University of Michigan

Background

In 2021, the Regents of the University of Michigan were awarded a data use agreement with CMS as a qualified entity (QE). The Michigan Value Collaborative (MVC) is the entity within the University that undertakes all QE reporting. The QE will henceforth be referred to as the Michigan Value Collaborative or MVC in this document.

MVC is a Collaborative Quality Initiative (CQI) working in partnership with Michigan hospitals, physician organizations, and Blue Cross Blue Shield of Michigan (BCBSM) / Blue Care Network (BCN) with the goal of improving the health of Michigan residents through sustainable, high-value healthcare. Since 2013, MVC has used claims-based episodes of care for health insurance payers in the state of Michigan to support and inform hospital quality improvement assessments and initiatives.

As a QE, MVC is required to disseminate a public report on provider performance annually, incorporating QE Medicare and other payer data. This report provides measures of 30-day unplanned rehospitalization from post-discharge home health for high-volume medical and surgical conditions, as well as measures of post-discharge outpatient follow-up for congestive heart failure (CHF) and chronic obstructive pulmonary disease (COPD). As part of the report development, MVC gathered stakeholder feedback on the proposed measures, which was incorporated into the final measure definitions, as appropriate.

Methods

MVC creates 30- and 90-day episodes of care for over 40 high-volume medical and surgical conditions using paid health insurance claims from BCBSM PPO Commercial, BCBSM PPO Medicare Advantage (MA), BCN HMO Commercial, BCN HMO MA, BCN Other, Medicare FFS, and Medicaid. Each episode begins with an index event (e.g., hospital admission or surgery, including emergency department (ED) and outpatient-based procedures) for one of MVC's 40+ conditions and includes up to 90 days of post-index utilization.

Index hospitalizations for conditions are identified by ICD-9/10-CM diagnosis codes, ICD-9/10-PCS procedure codes, and HCPCS/CPT codes. For index hospitalizations that include an inpatient transfer, the hospitalizations at both the original and receiving hospitals are included in the index event and the episode is attributed to the initial hospital. Episodes are created for patients with a qualifying index event, who are at least 18 years of age, and who were continuously enrolled with their insurance provider for at least 180 days prior to the index admission and 90 days following the index discharge. An exception to the enrollment requirement is made for Medicaid due to the nature of monthly Medicaid enrollment.



A patient can be in only one 90-day MVC episode at a time. Episodes are created chronologically; therefore, if a patient has multiple potential index events in a short time period, an episode is created for the index event that happened first. If a patient meets the eligibility requirements for more than one index condition event on the same day, a hierarchical logic is applied – based on the average payment for each condition – to initialize one condition/episode per patient per date. For the condition hierarchy implementation logic see Appendix A. For claim categorization rules of episode components see Appendix B.

Each episode is attributed to a single year or quarter according to the index hospital admission date. The following report contains episodes with index admissions between January 1, 2019, and December 31, 2020, that have been attributed to MVC member hospitals in the state of Michigan.

Each episode is attributed to one hospital according to the organization NPI on the index facility claim. When joining MVC as a member, each hospital self-identifies the organization NPIs to attribute to their hospital. Episodes for analysis are then limited to episodes attributed to MVC member hospitals in the state of Michigan, n=102 hospitals. All providers (hospital or home health agency) shown in this report are blinded.

Rates are calculated as the number of episodes meeting criteria for the outcome of interest, divided by the number of qualifying episodes, multiplied by 100. Both unadjusted and risk-adjusted rates are shown where indicated, and 95% Wald confidence intervals for proportions are calculated for unadjusted and adjusted rates.

$$\text{Unadjusted rate} = (\text{N episodes with outcome} / \text{N total episodes}) * 100$$

The reference population serving as a benchmark in this report is MVC All, which is a weighted rate comprised of episodes attributed to all MVC member hospitals.

At each level of reporting, measures and figures presented in this report do not show any data points based on a denominator of fewer than 30 episodes, in accordance with QECP guidelines. For example, rates by home health agency will not display any rates for home health agencies with fewer than 30 episodes in any reported time window. However, the calculation of overall measures includes all otherwise qualifying episodes regardless of their inclusion in more granular data points.



Unplanned Rehospitalization During First 30 Days of Home Health

This measure assesses unplanned rehospitalizations in the first 30 days of home health among patients who received home health care following an inpatient hospital discharge.

The underlying population for this measure consists of episodes for patients with a qualifying inpatient index hospitalization for a MVC condition and who were discharged to home or home health per index discharge disposition. Following CMS guidelines, qualifying index hospitalizations are assessed according to the single-level diagnosis clinical classification software (CCS) category for a hospitalization's principal diagnosis code, and exclude hospitalizations for treatment of cancer, psychiatric disease, or rehabilitation care (e.g., fitting of prostheses and adjustment devices). All episodes for cancer-related conditions and episodes for childbirth delivery were further excluded from the denominator. To be included in the analytic cohort, each patient is required to have started home health within 0 to 5 days following their index hospitalization discharge. Episodes meeting either of the following criteria are also excluded from analysis: those involving a home health transfer or for which inpatient-type care (i.e., inpatient hospitalization, inpatient rehabilitation, or skilled nursing facility) is received between index discharge and the start of home health. After applying exclusions, episodes for 27 conditions (see Appendix A for the full list) are included in the measure.

The measured outcome for this metric is the presence of an unplanned inpatient hospitalization that begins within 1 to 30 days following the start of a patient's post-discharge home health care. Inpatient hospitalization claims are categorized as planned or unplanned according to ICD-10-CM diagnosis codes, ICD-10-PCS procedure codes, and HCPCS/CPT codes in accordance with the 2021 CMS planned readmission algorithm (CMS, 2021 Hospital-Wide Readmission Measure Updates and Specifications Report – Version 10.0.). Unadjusted and risk-adjusted prevalence rates are calculated for this measure as described below.

All rates shown for combined conditions have been risk-adjusted to account for differences between index hospitalization conditions/patients. Expected probabilities of each outcome are generated for each episode using a logistic regression model adjusting for patient age, sex, payer, condition, DRG complication level, prior six months of payments, and 79 hierarchical condition categories. Rates are generated for each unit of analysis (by quarter, home health provider, and hospital of the index hospitalization) and then risk adjusted as follows, where the population expected rate is the overall expected rate for all eligible episodes at MVC member hospitals.

Observed or unadjusted rate = $N \text{ episodes with outcome} / N \text{ total episodes} * 100$

Risk-adjusted rate = $(\text{observed rate}/\text{expected rate}) * \text{population expected rate}$



Outpatient Follow-Up Within 3, 7, 14, and 30 Days of CHF/COPD Hospitalization

This measure assesses the proportion of patients with episodes for CHF and COPD who received outpatient follow-up following their index hospital discharge.

The underlying population for this metric is comprised of patients insured by payers in the MVC database who have 90-day CHF and COPD episodes of care at MVC member hospitals. Only index hospitalizations resulting in discharge to home or home health, as assessed according to the discharge disposition on the claim, are included. Patients receiving care at a skilled nursing facility or inpatient rehabilitation unit during the 30 days post-discharge are further excluded from the denominator of this measure.

Follow-up visits are defined using professional claims including the M1 Berenson-Eggers Types of Service (BETOS) category of office visits or CPT codes for transitions of care (99495 and 99496). The definition also includes remote follow-up by phone or video (CPT: 99441, 99442, 99443). Receipt of follow-up is assessed beginning the day after index discharge. In this measure patients are not considered to have received timely follow-up if the patient had an outpatient procedure, ED visit, or inpatient readmission between index discharge and their first post-discharge office visit. Four different follow-up windows are shown for CHF and COPD episodes, namely three days, seven days, 14 days, and 30 days. This measure was originally designed to show follow-up within 14 days for CHF and 30 days for COPD; however, MVC stakeholders requested the inclusion of additional follow-up windows.

This measure was not risk-adjusted. In a sensitivity analysis, risk adjustment had little effect on follow-up rates. Additionally, MVC believes that timely follow-up is a service that all patients should receive regardless of their demographic characteristics and comorbidities, which makes comparison of unadjusted rates more beneficial to hospital members.



Findings

Unplanned Rehospitalization During First 30 Days of Home Health

In 2019-2020, the overall risk-adjusted rate of unplanned rehospitalization during the first 30 days of home health was 11.2%. Risk-adjusted rates varied from 10% to 12% in each calendar quarter (Figure 1). Risk-adjusted rates ranged from 0.0% to 15.2% (Figure 2) among MVC member hospitals, according to the hospital of the index inpatient stay. By home health provider, risk-adjusted rates of rehospitalization ranged from 0.0% to 17.2% (Figure 3). For the majority of attributed hospitals and home health providers, the risk-adjusted rate of unplanned rehospitalization during the first 30 days of home health did not differ significantly from the overall collaborative rate of 11.2%.

Figure 1. Risk-Adjusted Rates of 30-Day Unplanned Rehospitalization From Home Health, by Quarter

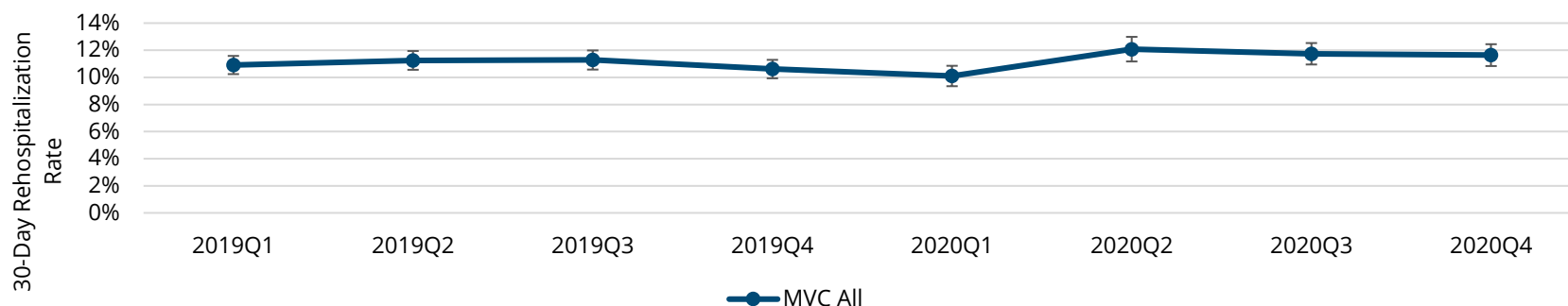


Figure 2. Risk-Adjusted Rates of 30-Day Unplanned Rehospitalization From Home Health, by MVC Hospital

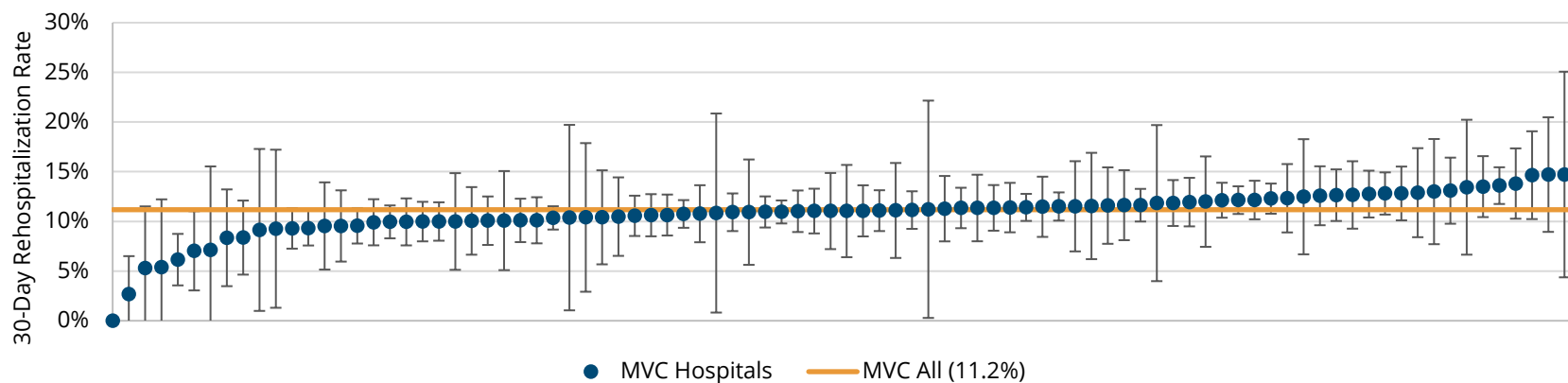
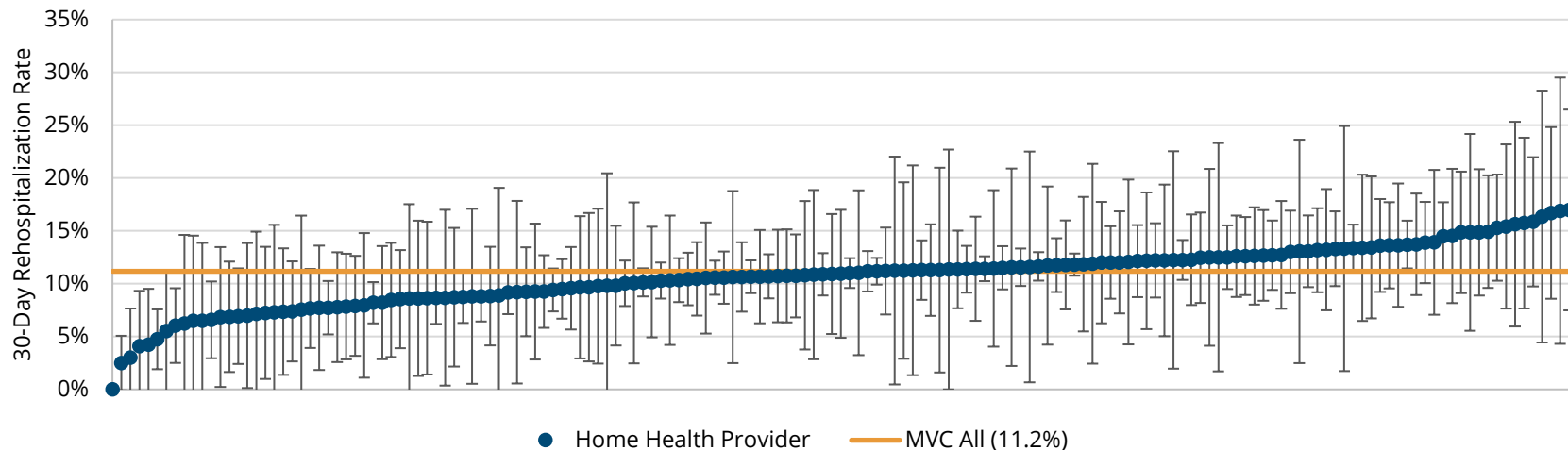
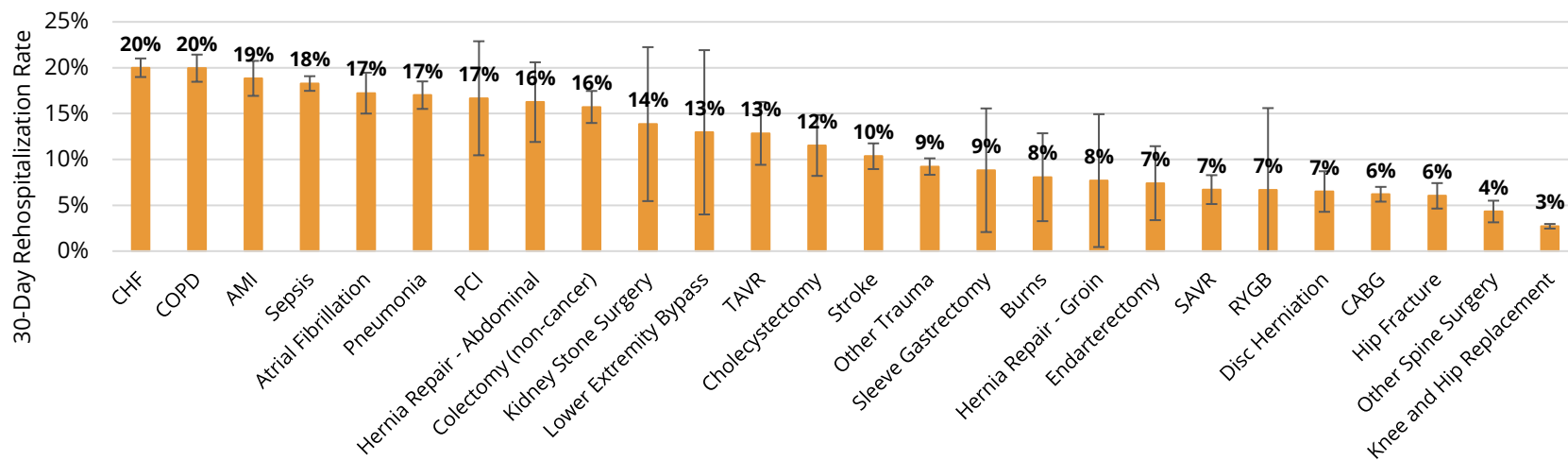


Figure 3. Risk-Adjusted Rates of 30-Day Unplanned Rehospitalization From Home Health, by Home Health Provider



The index conditions with the highest unadjusted rate of 30-day rehospitalizations from home health were congestive heart failure (CHF) and chronic obstructive pulmonary disease (COPD) at 20.0% (Figure 4). The condition with the lowest unadjusted rate was knee and hip replacement (2.7%).

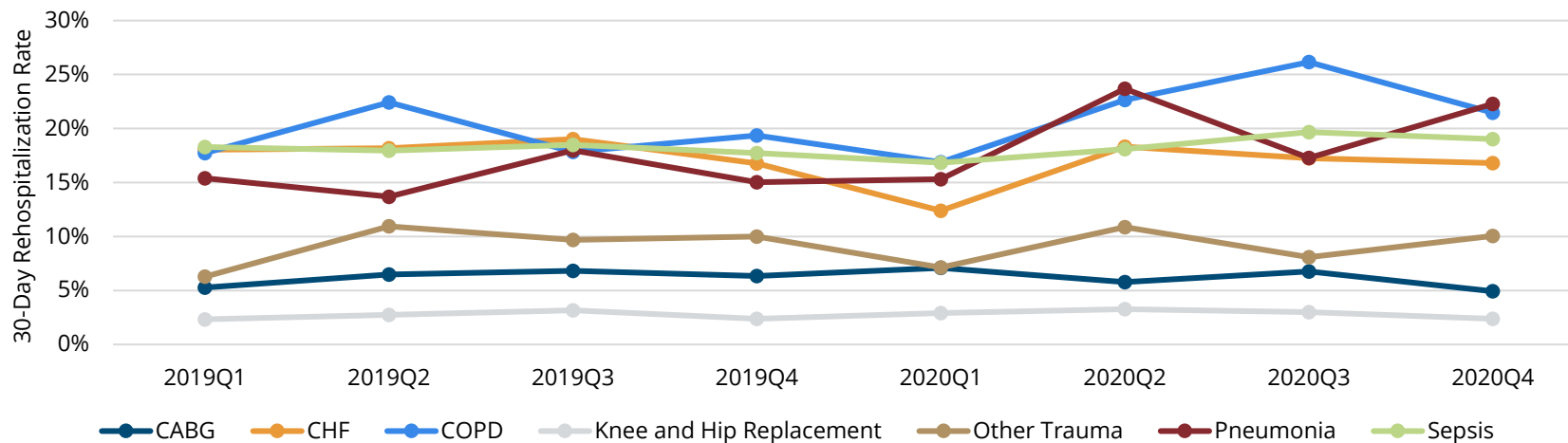
Figure 4. Unadjusted Rates of 30-Day Unplanned Rehospitalization From Home Health, by Condition





Among high-volume conditions, the condition-specific unadjusted 30-day rate of unplanned rehospitalization from home health remained fairly consistent by quarter from 2019 Q1 through 2020 Q4 (Figure 5). High-volume conditions with the largest amount of variation in unadjusted rate by quarter were COPD and pneumonia.

Figure 5. Unadjusted Rates of 30-Day Rehospitalization From Home Health, by Quarter, for High Volume Conditions



Among episodes where home health care began within 0 to 5 days following the index hospitalization discharge, for the majority of episodes (53.2%) home health care began one day following index discharge (Figure 6). The average number of days to the start of home health care was 1.8 days (Figure 7). Home health care began earliest for episodes of knee and hip replacement (average of 1.3 days) and latest for stroke (average of 2.2 days).

Figure 6. Distribution of Number of Days From Index Discharge to Start of Home Health, All Conditions

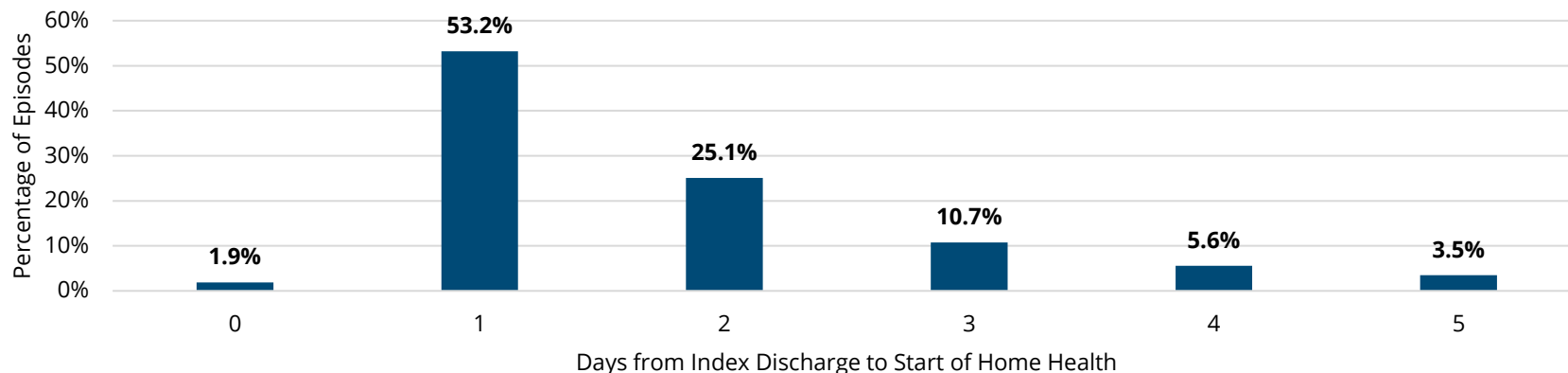
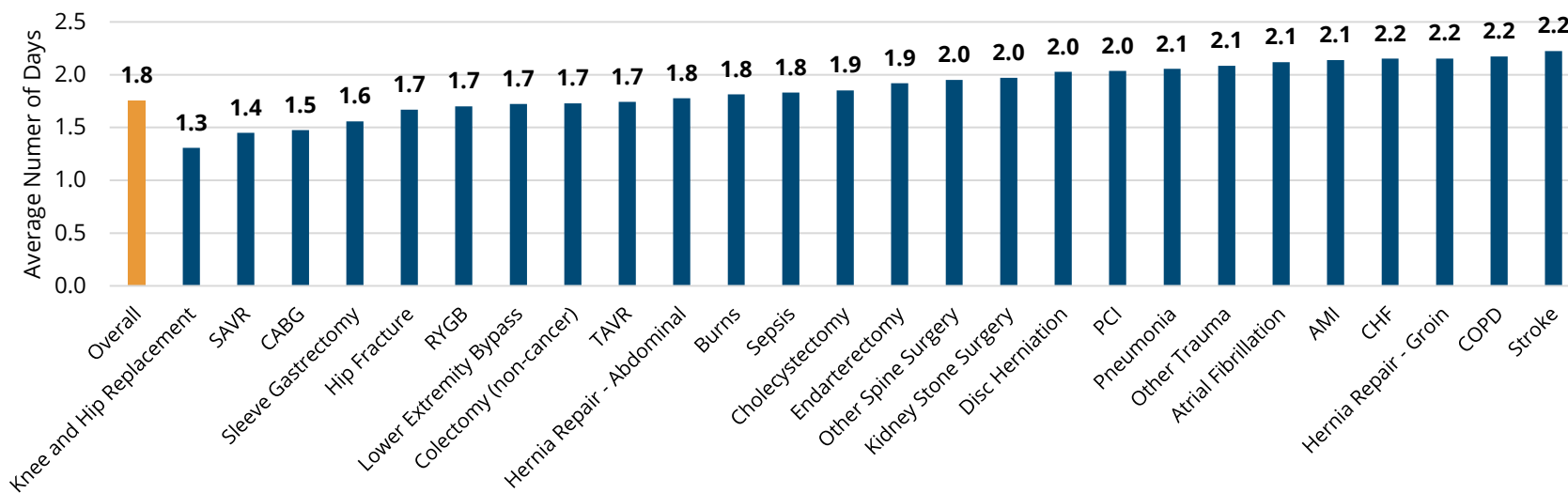


Figure 7. Average Number of Days From Index Discharge to Start of Home Health (Range of 0 to 5 Days), Overall and by Condition



The number of days from start of home health to first unplanned rehospitalization ranged fairly evenly from 1 to 30 days (Figure 8). The average number of days from the start of home health care to first unplanned rehospitalization was 12.7 days (Figure 9). By index hospitalization condition, the number of days ranged from 10.0 days (episodes for non-cancer colectomy) to 14.0 (episodes for COPD).

Figure 8. Distribution of Number of Days From Start of Home Health to First Unplanned Rehospitalization, All Conditions

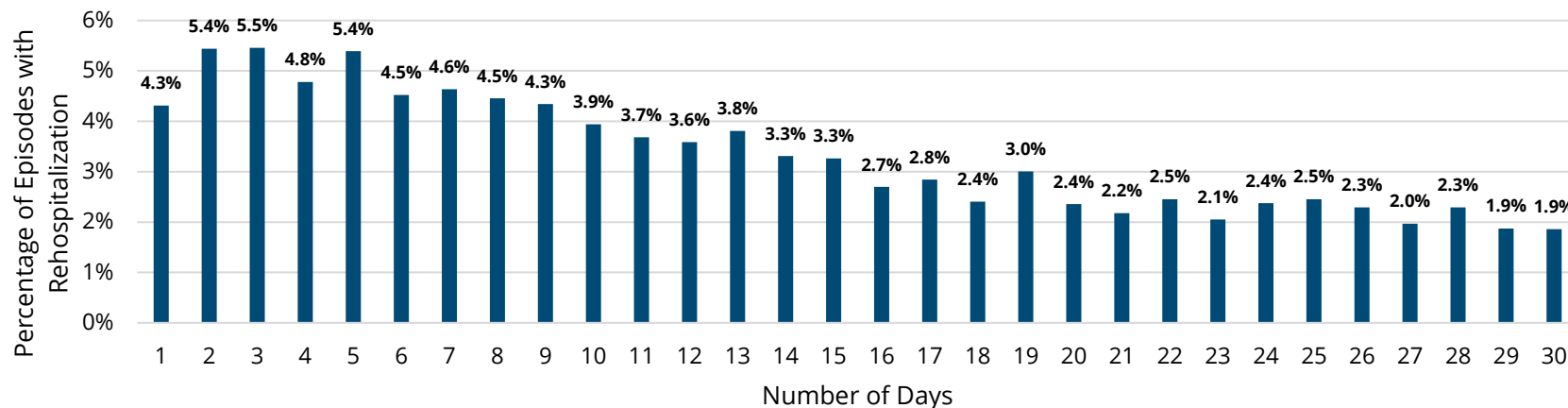
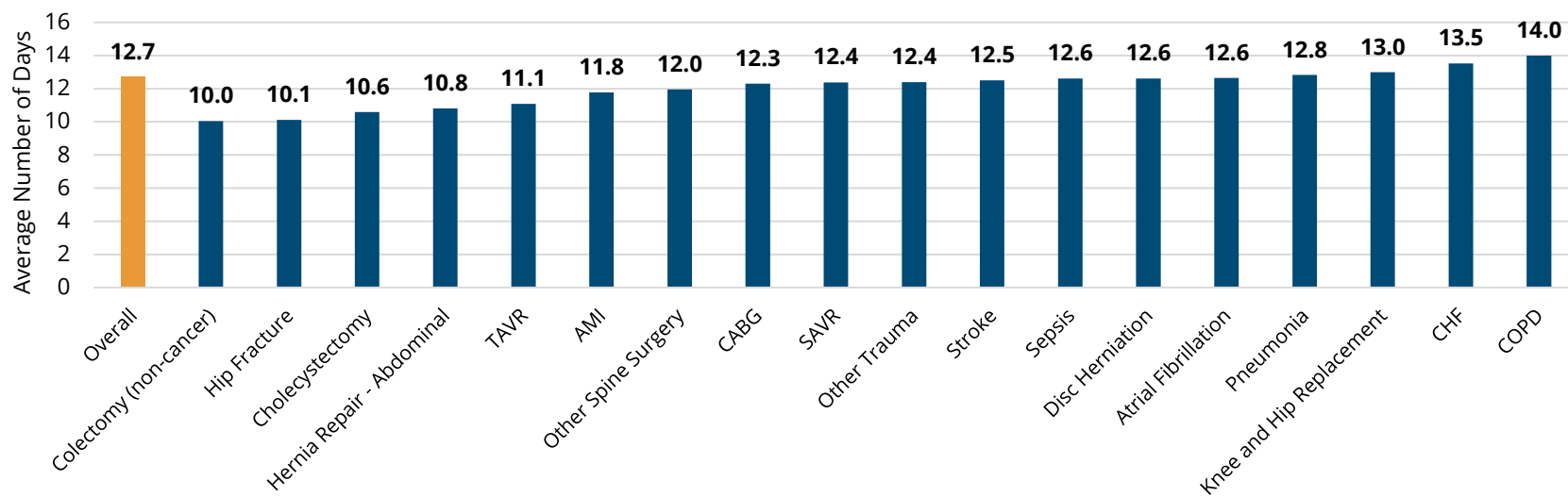


Figure 9. Average Number of Days From Start of Home Health to First Unplanned Rehospitalization, Overall and by Condition





Outpatient Follow-Up Within 3, 7, 14, and 30 Days of CHF Hospitalization

The outpatient follow-up rates in Michigan vary greatly by index hospital. While many hospitals are near the MVC average, all follow-up windows have hospitals that are significantly above or below the mean. The MVC average rate for 3-, 7-, 14-, and 30-day follow-up were 16%, 46%, 64% and 72% (Figures 10-13).

Figure 10. 3-Day Follow-Up After CHF by MVC Hospital

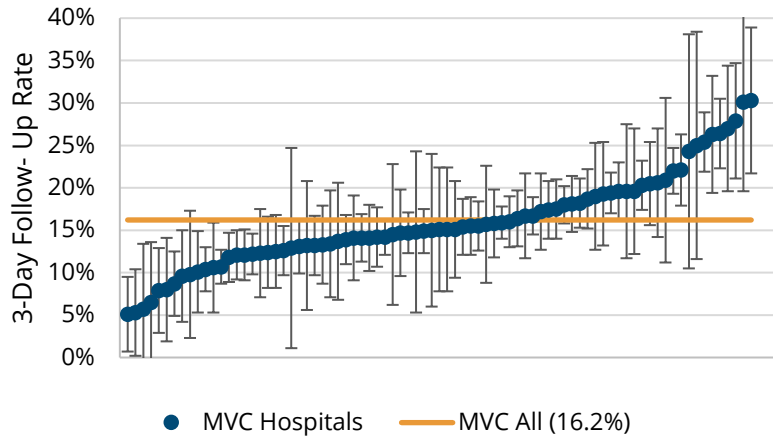


Figure 11. 7-Day Follow-Up After CHF by MVC Hospital

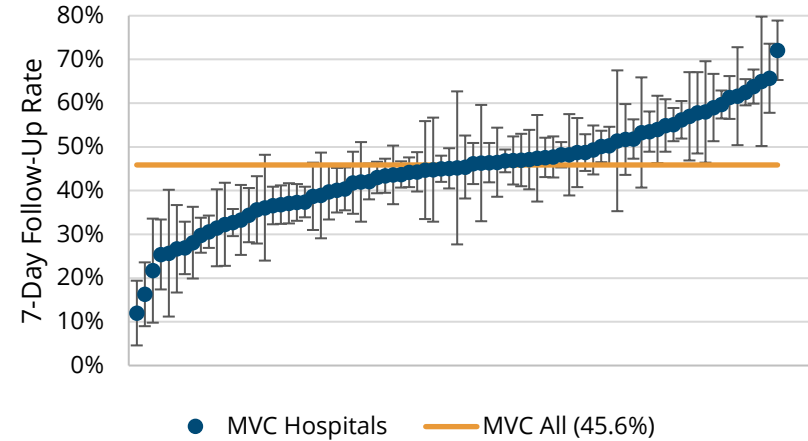


Figure 12. 14-Day Follow-Up After CHF by MVC Hospital

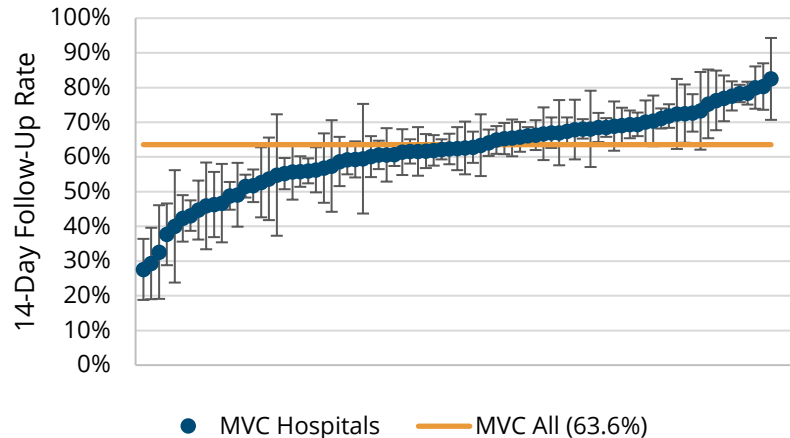
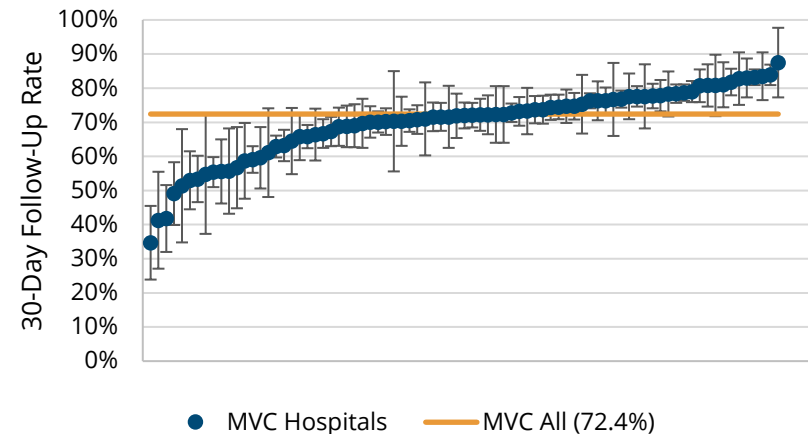


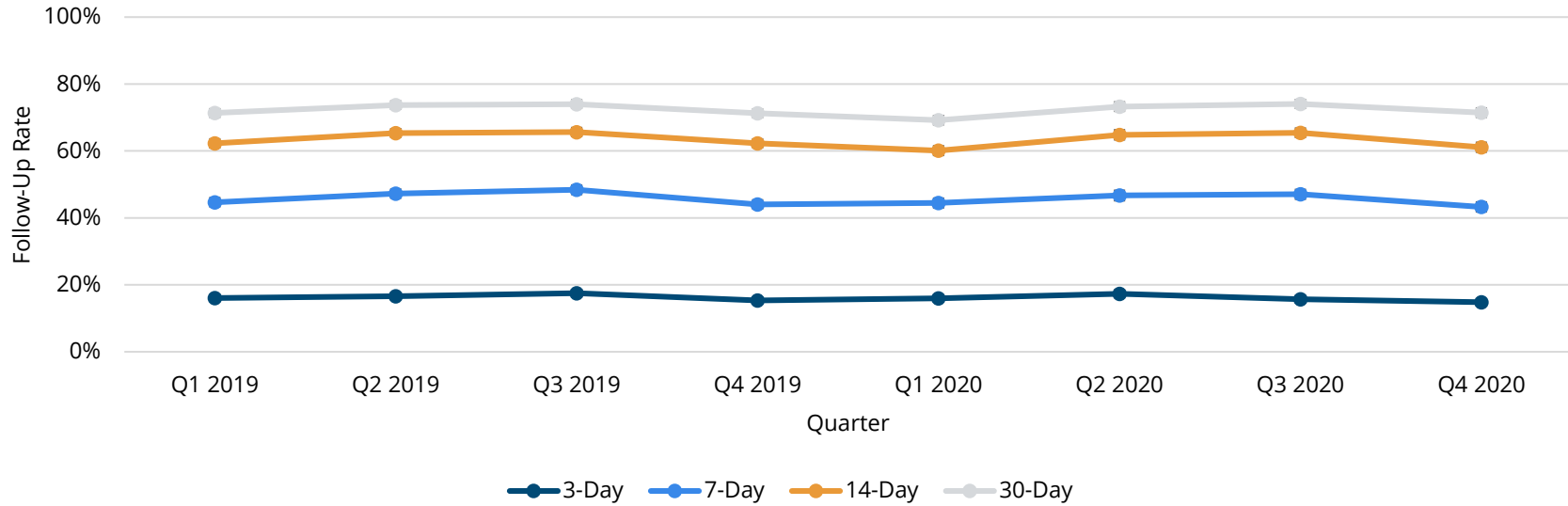
Figure 13. 30-Day Follow-Up After CHF by MVC Hospital





There was little overall change in the CHF follow-up rates over time across all MVC hospitals. All windows of follow-up showed a slight increase in follow-up rate in quarter three of 2019 followed by a decrease in quarter one of 2020 (Figure 14). The COVID-19 pandemic did not have a noticeable effect on follow-up rates for CHF.

Figure 14. Outpatient Follow-Up After CHF Hospitalization at MVC Hospitals, by Quarter





Outpatient Follow-Up Within 3, 7, 14, and 30 Days of COPD Hospitalization

As with CHF, there was substantial variation across hospitals in follow-up rates for COPD. In general the follow-up rates were lower for COPD than for CHF. The MVC collaborative-wide rate of 3-, 7-, 14-, and 30-day follow-up were 13%, 37%, 53% and 63%, respectively (Figures 15-18).

Figure 15. 3-Day Follow-Up After COPD by MVC Hospital

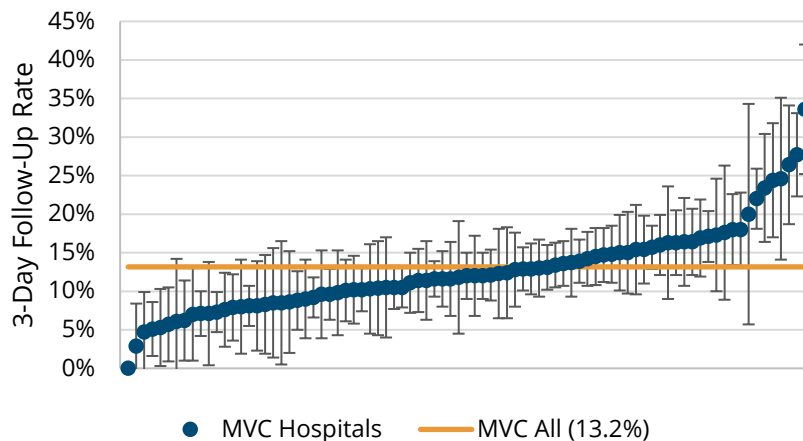


Figure 16. 7-Day Follow-Up After COPD by MVC Hospital

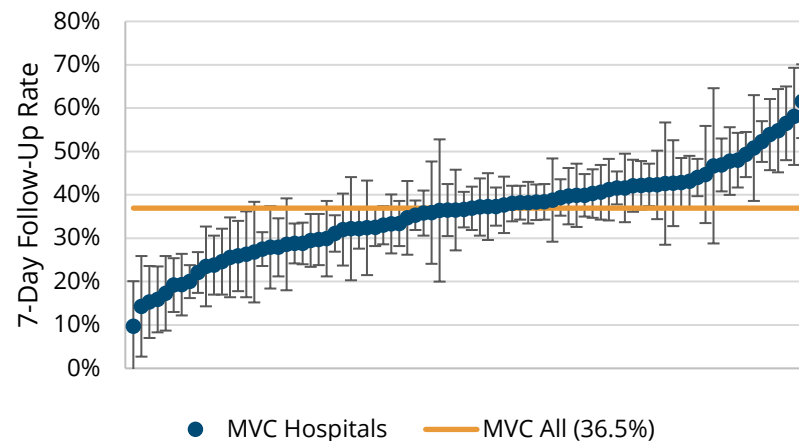


Figure 17. 14-Day Follow-Up After COPD by MVC Hospital

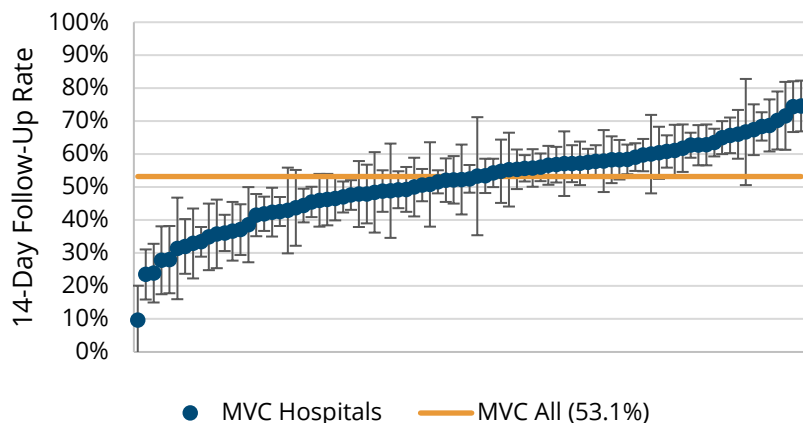
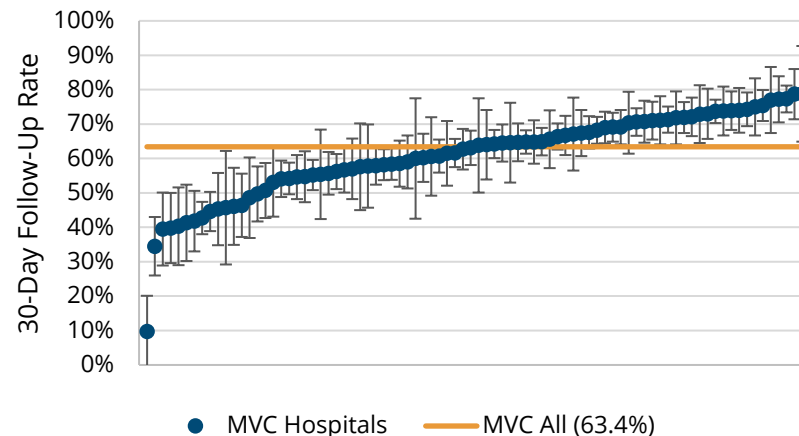


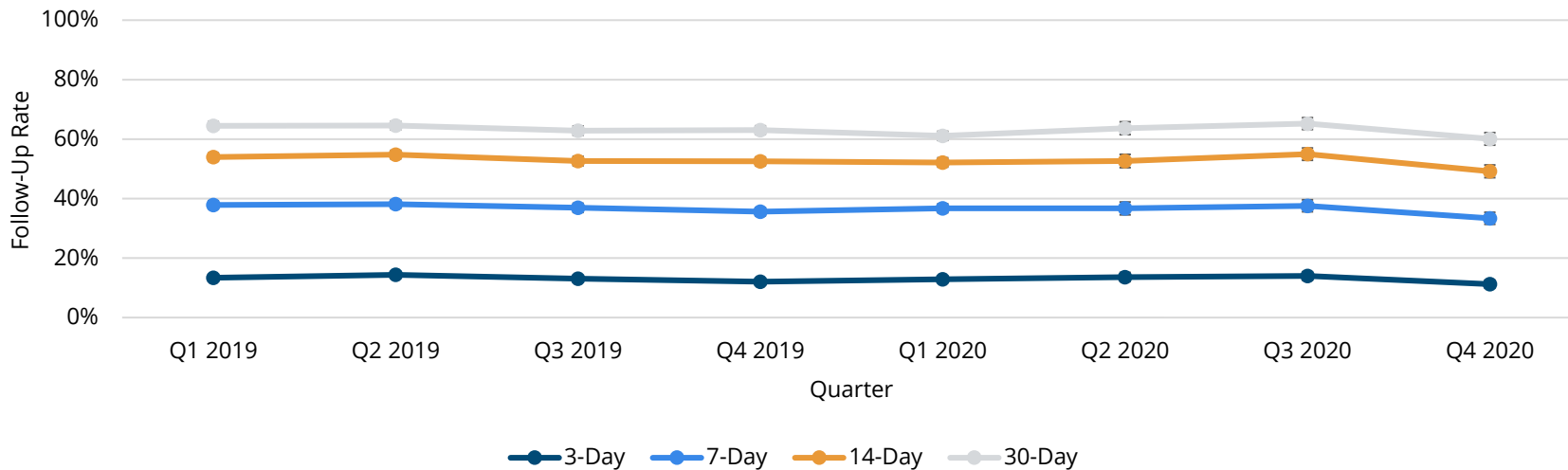
Figure 18. 30-Day Follow-Up After COPD by MVC Hospital





Outpatient follow-up after COPD had little change from Q1 2019 to Q4 2020. Across all follow-up windows there was a slight decrease in follow-up rate in quarter 4 of 2020 (Figure 19). The average follow-up rate was higher for CHF compared to COPD across all evaluated follow-up windows.

Figure 19. Outpatient Follow-Up After COPD Hospitalization at MVC Hospitals, by Quarter



**Michigan Value Collaborative Condition List and Hierarchy
Specific to 2022 QE Public Report Measures**

Condition	Hierarchy
Acute Myocardial Infarction (AMI)	6
Appendectomy	19
Atrial Fibrillation	22
Burn	27
Cholecystectomy	16
Chronic Obstructive Pulmonary Disorder (COPD)	11
Colectomy (non-cancer)	5
Congestive Heart Failure (CHF)	10
Coronary Artery Bypass Graft (CABG)	3
Disc Herniation	14
Endarterectomy	20
Hernia Repair - Abdominal	24
Hernia Repair - Groin	23
Hip Fracture	4
Kidney Stone Surgery	21
Knee & Hip Replacement	15
Lower Extremity Bypass	26
Other Spine Surgery (Cervical Disc Degeneration; Cervical Spinal Stenosis; Lumbar Spinal Stenosis; Lumbar Spondylosis)	9
Percutaneous Coronary Intervention (PCI)	12
Pneumonia	8
Roux-en-Y gastric bypass (RYGB)	17
Sepsis	25
Sleeve Gastrectomy	18
Stroke	13
Surgical Aortic Value Replacement (SAVR)	1
Transcatheter Aortic Valve Replacement (TAVR)	2
Trauma (Other than hip fracture or burns)	7

MVC Claim Categorization Rules

Facility Claim Type	New Definition
Inpatient	(1) Bill Type = 11 (or 12 if DRG present) and (2) DRG* is not a rehab code (945, 946, 949, 950) and (3) Revenue code is not an IP rehab code (118, 128, 138, 148, 158)
Skilled Nursing Facility (SNF)	Bill Type in (18, 21)
Emergency Department (ED)	(1) Bill Type = 1x or Bill Type = 85 and (2) Revenue code is an ED code (450, 451, 452, 456, 459)
Home Health (HH)	Bill Type in (31, 32, 33, 34)
Inpatient Rehabilitation	(1) Bill Type = 11 and (2) DRG* is a rehab DRG (945, 946, 949, 950) or revenue code is an IP rehab code (118, 128, 138, 148, 158)
Outpatient Rehabilitation	(1) Revenue code is an OP rehab code (41X, 42X, 43X, 44X, 940, 941, 943, 944, 945, 948) or (2) CPT is a rehab CPT or (3) Bill Type in (74, 75)
Outpatient / Other	Everything else

*Regrouped DRG