



# Healthcare Quality Performance

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**Disease Modifying Anti-Rheumatic Drug (DMARD) Therapy  
for Rheumatoid Arthritis**

***Patterns of Utilization - 2018 Measurement Year***

**A public report on behalf of the  
Centers for Medicare & Medicaid  
Services Qualified Entity program**

**November 3, 2021**

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## Who We Are

Komodo Health is a technology company with a mission of reducing the burden of disease. We combine an in-depth view of patient encounters with innovative algorithms and decades of clinical expertise to power our Healthcare Map™, one of the most robust and representative views of the U.S. healthcare system. Using our Healthcare Map, we offer a suite of powerful software applications that enable healthcare industry stakeholders to understand how healthcare is currently delivered and identify high-value interventions that can improve cost-effectiveness, clinical-effectiveness, or equity.

## What Is the Purpose of *This* Report?

Komodo Health uses data to measure and quantify healthcare processes in the United States. Komodo focuses specifically on **effectiveness** and **equity of access** to high-quality and evidence-based healthcare and provides stakeholders with additional and potentially actionable insights relating to variations in quality or effectiveness of care. Komodo Health uses a combination of standard process and outcome measures developed and endorsed by experts over the past decade, and novel/alternative methods that we have been developing to measure and quantify variations in healthcare processes that may impact clinical effectiveness, efficiency, or outcomes for patients. This report presents a summary of our findings on access to/use of specific evidence-based practices in 2018 using a standard process measure endorsed by the National Quality Forum.

## What Are We Measuring?

Komodo measures and quantifies the extent to which patients in the United States are receiving recommended pharmacological (medication) therapies for chronic and debilitating conditions, and whether they also are being monitored for specific side effects or risks relating to the use of these medication therapies. For this report, Komodo used a Healthcare Effectiveness Data and Information Set (HEDIS®) standard measure that was developed by experts and is endorsed by the National Quality Forum, and is initially reporting on **Measurement Year 2018**. The HEDIS® standard measure included in this report is:

- **NQF ID: 0054**  
Disease Modifying Anti-Rheumatic Drug (DMARD) Therapy for Rheumatoid Arthritis

## Why Is This Measure Important?

Rheumatoid arthritis is a chronic condition in which a patient's own immune system attacks the tissues lining their joints and other organs. This immune response produces inflammation, pain, and swelling in the affected joints and organs. Over time, the inflammation can produce deformity and destruction of joints and can significantly limit the ability of the patient to do normal activities with the affected joints. When other organs are affected, patients can experience a broader range of

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health effects besides joint destruction. In the United States, this disease affects individuals of all racial and ethnic groups. However, there is some evidence that Blacks and Hispanics may experience more severe symptoms or long-term disabilities compared to individuals in other racial and ethnic groups. At this time, clinicians and scientists do not have a complete understanding of the factors that contribute to these differences in disease activity or long-term outcome.

Today, there are many medications – some new and some that have been available for decades – that have the potential to slow the progression of bone destruction and other active symptoms in patients with rheumatoid arthritis. As a group, these medications are referred to as Disease Modifying Anti-Rheumatic Drugs or DMARDs. Despite evidence showing that DMARDs can control symptoms and slow the progression of joint damage, recent reports suggest that there is unexpected variation in the use of these medications among different groups of patients. There may be different reasons why a patient delays or does not use DMARD therapy. These might include:

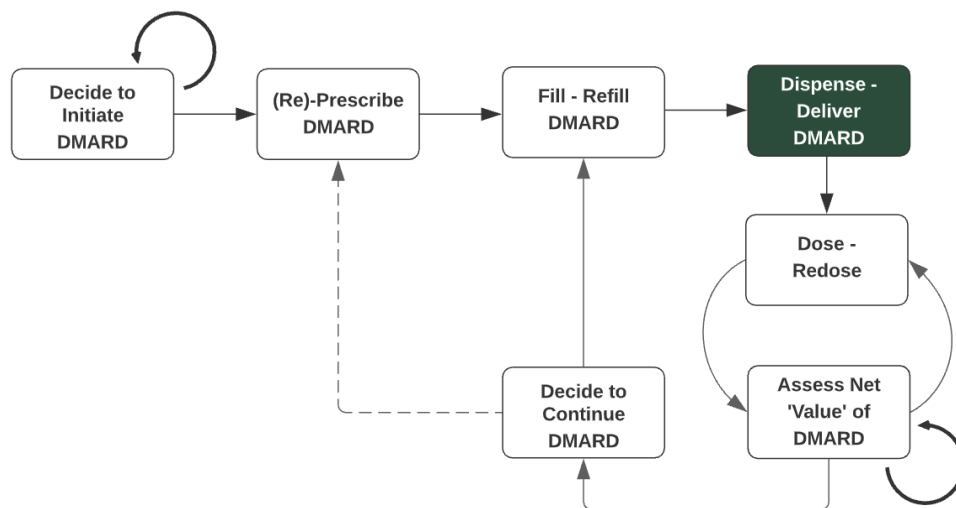
- Medical contraindications such as allergy or uncontrollable side effects
- Patient preferences unrelated to medical contraindication
- Low disease activity or limited symptom severity
- Lack of patient involvement in decision-making around medication therapy
- Differences in prescribing habits and clinical practice styles between practitioners who care for patients with rheumatoid arthritis
- Lack of access to a specialist who can and will evaluate the appropriateness of DMARD therapy, prescribe, and monitor response
- Whether or how much a patient's insurance or health plan covers the therapy
- High out-of-pocket cost of therapy (related to insurance or health plan coverage)

Differences in patient use of DMARD therapy that are related to cost, health insurance coverage, lack of access to specialists, lack of patient involvement in treatment decisions, or differences in clinical practice styles are concerning. Continuous measurement and monitoring can help identify systematic, undesirable, and potentially modifiable variations in access to effective, evidence-based care for patients with rheumatoid arthritis. However, it is important to know what aspect of the medication therapy sequence to measure, and what variability in a given measurement can tell us.

Figure 1, which is a simplified representation of the sequence of key events relating to the use of DMARDs, can be used to illustrate this concept. Ideally, in order to understand DMARD *use* patterns, one would try to measure medication dosing events – i.e., events signaling that the patient consumed the prescribed dose of the DMARD. However, reliably and consistently measuring the rate at which patients who are prescribed a medication actually *receive* a dose poses challenges. As an alternative, we often try to estimate DMARD *use* by measuring DMARD medication dispensing events using either pharmacy data or prescription drug claims. In contrast to medication dosing events, medication dispensing events can be measured reliably and consistently over time in an ambulatory context. It is important to acknowledge that when a patient takes possession of a prescribed medication through a dispensing event, this does not guarantee that a patient receives a

dose of the medication. However, dispense events can be detected reliably and consistently in pharmacy and claims data and can serve as an informative proxy to DMARD use across a population of patients with rheumatoid arthritis.

**Figure 1.** Continuum of key events relating to DMARD use in patients with Rheumatoid Arthritis. The decision to initiate, continue or change a DMARD therapeutic agent ideally is made collaboratively by *physician and patient* after consideration of a number of factors including, but not limited to: current functional status, symptom severity, anticipated benefits from DMARD, anticipated side effects and tolerance of these side effects. After a decision to initiate a DMARD, the *physician* prescribes, the *pharmacist* fills and dispenses/delivers the drug to the *patient* (or their agent). The *patient* then must decide to take the medication (dose or self-administer). Initial dosing and/or re-dosing does not always occur even after the patient has taken possession of the DMARD and initial dosing and redosing as prescribed are neither predictable nor easily measured across a large population. Patients may continually reassess the perceived value of the DMARD in terms of symptom relief vs. tolerability vs. cost vs. other factors. After successive redosing events, the patient may decide to continue on the DMARD and either request a refill or a renewal of the prescription. Ideally, the *patient* shares information with the *prescribing physician* and modifications can be made, as needed, in the DMARD regimen (e.g., continuation, dose change, therapeutic agent change, discontinuation, etc.).



In this report, Komodo is measuring DMARD dispense rates in the US population of patients with rheumatoid arthritis using a specific method referred to as NQF ID 0054 *Disease-Modifying Anti-Rheumatic Drug Therapy for Rheumatoid Arthritis (ART)*. This is characterized as a process measure – a quantitative measure of the degree to which the process of care meets a defined goal or standard. This measure also has been endorsed by US and European specialty organizations as a reliable way of measuring the proportion of patients with rheumatoid arthritis who are receiving medications that have been demonstrated to control symptoms and possibly slow the progression of disease.

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## What Data Did We Use for Measurement?

Komodo combined its internal Commercial and Medicaid data sources with the Centers for Medicare & Medicaid Services (CMS) Medicare 100% fee-for-service data set. This enabled us to evaluate and measure processes of care across a diverse group of patients. We also were able to look for differences in how care is delivered to patients depending on where a patient lives and whether they enrolled in a private insurance plan (Commercial), the Medicaid program, or the Medicare program.

Komodo Health's substantial all-payer data assets provided us with a sufficiently large population of eligible patients so that we were able to measure dispense rates at the national, regional and local levels, stratify by health plan enrollment category, and by rural/urban residency using guidelines established by the Federal Office of Rural Health Policy. The following is a list of U.S. states and territories in which Komodo's combined data produced eligible or relevant patient population cohorts of sufficient size to support measure calculation and reporting:

AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY

## How Is the Measure Calculated?

Komodo applied the standard metric specification for **NQF ID: 0054** to patients enrolled in any of the following types of health insurance categories: Commercial, Medicaid Managed Care, Medicaid-Medicare Dual, Medicare Advantage and Medicare Fee-for-Service. Table 1 briefly summarizes the numerator, the denominator and the exclusions that were applied prior to calculating DMARD dispense rates. See **Appendix 1** for full details of the HEDIS® measure specifications. Compared to Measurement Year 2017, there are no significant changes to the numerator or denominator definitions for **Measurement Year 2018**. Komodo used a combination of enrollment and claims data to assign each patient to a health insurance category. For this analysis, the Commercial-Private category represents a mix of traditional indemnity insurance and managed care product types including PPO, HMO and EPO. It includes employer-sponsored health plans and qualified health plans available through a state or federal health insurance exchange. The Medicaid- Medicare Dual category represents the program for individuals concurrently ('dually') eligible for Medicare and Medicaid. Medicaid Managed Care, Medicaid- Medicare Dual and Medicare Advantage each are programs in which services are provided under a managed care payment model. Finally, the Medicare Fee-for-Service category represents the traditional Medicare in which services are not provided under a managed care payment model. The Medicare Advantage category excludes Special Needs Plans or SNPs; all patients enrolled in SNPs were assigned to the Medicaid-Medicare category.

Komodo used prescription drug claims data to identify DMARD dispense events. After confirming that a patient was concurrently enrolled in a medical *and* a prescription drug health benefit, we

screened all prescription drug data for that patient and attributed a DMARD dispense event to the patient if a claim was paid for a complete fill, a partial fill, or the completion of a partial fill by either retail, hospital-based or mail order pharmacy.<sup>1</sup> If a patient changed health insurance categories during the measurement year, Komodo assigned them to the health insurance category that was active on the date of the first prescription fill event for the DMARD agent (i.e., the medication dispense event). If a patient was concurrently enrolled in Medicare and a commercial supplemental benefit, Komodo assigned that patient to their Medicare category (either Medicare Advantage or Medicare Fee-for-Service). If a patient was enrolled in Medicare for medical coverage but concurrently was participating in the Retiree Drug Subsidy (RDS) Program, Komodo assigned that patient to their Medicare category. Komodo assigned each patient in the eligible population exclusively to one state or territory based on their state of residence in January of the measurement year. If the patient’s residential state or territory could not be confirmed via an enrollment file, Komodo assigned the patient to the prescriber’s state or territory.

**Table 1.** Summary of inclusion and exclusion criteria for NQF ID 0054. See Appendix 1 for full details of measure specification

<b>Measure Description</b>	The percentage of beneficiaries 18 years of age and older who were diagnosed with rheumatoid arthritis and who were dispensed at least one ambulatory prescription for a disease-modifying anti-rheumatic drug (DMARD).
<b>NQF Status</b>	<ul style="list-style-type: none"> <li>• NQF-Endorsed</li> <li>• Measure ID 0054</li> <li>• Process Measure Type</li> <li>• <b>Measurement Year 2018</b></li> </ul>
<b>Denominator (eligible population)</b>	<ul style="list-style-type: none"> <li>• All patients 18 years or older <b><i>and</i></b></li> <li>• Continuously enrolled in a medical and prescription drug health benefit (private or public insurance plan) <b><i>and</i></b></li> <li>• Diagnosed with rheumatoid arthritis</li> </ul>
<b>Numerator</b>	Patients in the eligible population who had at least one prescription dispensed for a DMARD during the measurement year.
<b>Exclusions</b>	<ul style="list-style-type: none"> <li>• Exclude all patients with a diagnosis of HIV any time during the member’s history through December 31 of the measurement year.</li> <li>• Exclude female patients with a diagnosis of pregnancy any time during the measurement year.</li> <li>• Exclude all patients who are in hospice at any time during the measurement period</li> </ul>

<sup>1</sup> An adjudicated, paid claim typically signals that the prescription was both filled by the pharmacy and picked up by the patient.

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## What Did We Discover?

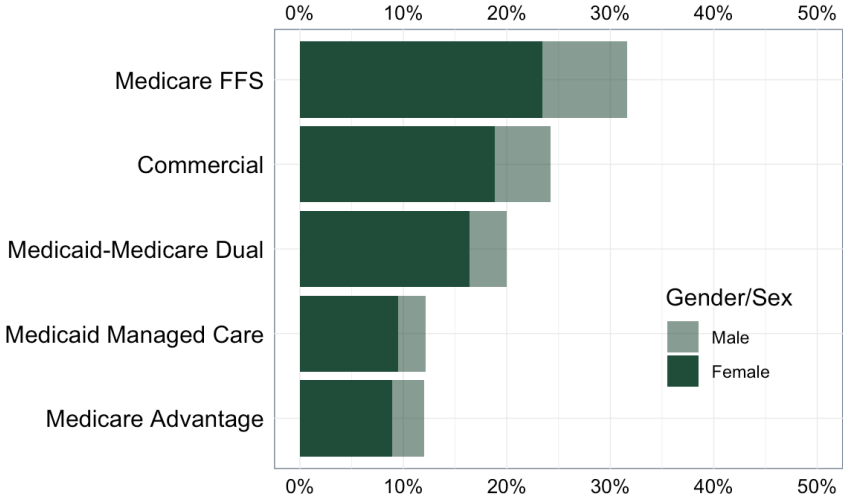
### *Population Overview and Demographics*

After applying all inclusion and exclusion criteria, Komodo's Healthcare Map yielded 1,184,020 adult rheumatoid arthritis patient cases that could be evaluated for DMARD dispensing during the **Measurement period of 2018**. This compares to 1,185,147 cases identified in Measurement Year 2017. As was the case for the prior Measurement Year, in this 2018 report, we refer to these 1,184,020 adult rheumatoid arthritis patient cases meeting the eligibility inclusion criteria as the *eligible* population. Although the eligible population was identified from a large all-payer data set, when we segmented the eligible population by category of insurance coverage, patients enrolled in Medicare Fee-for-Service (FFS) constituted the largest cohort. Since the majority of Medicare Fee-for-Service and Medicare Advantage beneficiaries enroll at age 65 years, the distribution of ages in the eligible population enrolled from Medicare were significantly different from those of the other healthcare coverage categories, but consistent with values in the underlying populations from which they were selected. The female-to-male sex/gender ratios observed in the measurement population were approximately 3:1 in the Commercial, Medicaid Managed Care, Medicare Advantage and Medicare Fee-for-Service categories and approximately 4:1 in the Medicaid-Medicare Dual category. These sex/gender ratios are consistent with what is known about the epidemiology of rheumatoid arthritis in the adult U.S. population, and what has been published in contemporary population-based research studies using claims data and by public health agencies such as the CDC using survey data, registries and contemporary population-based studies.

**Table 2.** Summary demographics of the population meeting all inclusion and exclusion criteria for measure specification NQF ID 0054.

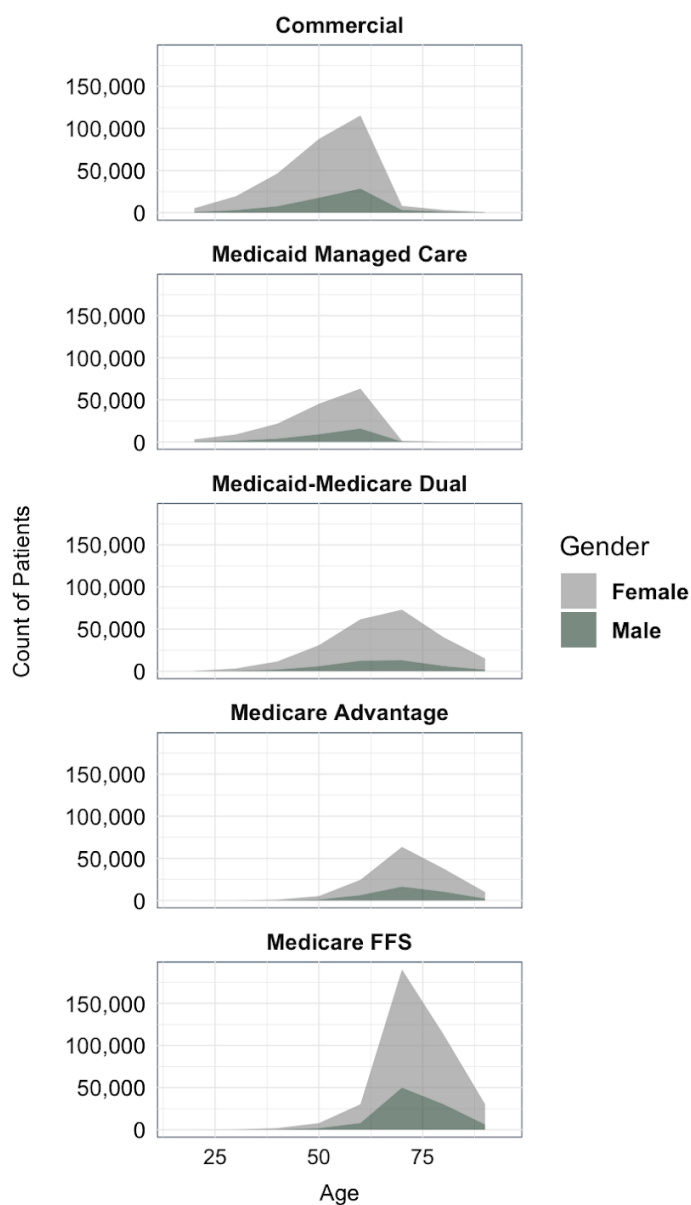
Health Insurance Category	Eligible	Mean Age	Median Age	Percent Female	Percent Male
Commercial-Private	286,602	52.1	54	77.9%	22.1%
Medicaid Managed Care	144,202	52.0	54	77.8%	22.2%
Medicaid-Medicare Dual	236,284	65.9	67	82.0%	18.0%
Medicare Advantage	142,522	71.7	72	73.9%	26.1%
Medicare Fee-for-Service	374,410	73.2	73	74.1%	25.9%

**Figure 2.** Patients enrolled in Medicare Fee-for-Service (FFS) represented the largest cohort when the measure population was segmented by category of insurance coverage. Across all insurance categories, a significantly larger percentage of patients meeting the inclusion criteria were female.



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**Figure 3.** Frequency distribution of patient ages in the eligible population, segmented by health insurance coverage category.

### ***Variations in DMARD Dispense Rates Based on Health Insurance Category***

Komodo found that among the 1,184,020 rheumatoid arthritis patients in the eligible population, approximately 65% were prescribed and had dispensed at least one disease-modifying anti-rheumatic drug (DMARD) sometime during the **2018 measurement year**.<sup>2</sup> This reflects a 9% increase in DMARD dispense rates compared to measurement year 2017. As was observed in 2017, dispense rates varied significantly depending on the type of insurance coverage that a patient had. We summarized the results in Table 2 and Figure 2 below. The highest dispense rate was observed

<sup>2</sup> Per the measure specification, initiation of DMARD therapy and continuation of an existing DMARD regimen during the measurement year both qualified as valid dispense events for patients in the eligible population.

in the group of patients in the Medicaid Managed Care category. This is a significant change from the prior measurement year (2017), during which time, the Medicaid Managed Care category accounted for the lowest dispense rate. During **Measurement Year 2018**, the lowest dispense rate was observed in the group of patients in the Medicaid-Medicare Dual category. Using Pearson's chi-squared test and the Marascuilo procedure, we determined that the differences in the DMARD dispense rates were highly statistically significant. The Marascuilo procedure tests for the statistical significance of differences in DMARD dispense rates between each pair-wise combination of groups.<sup>3</sup>

**Table 3.** Summary results of DMARD dispensing rates in patients diagnosed with Rheumatoid Arthritis. Results are for **Measurement Year 2018**.

Health Insurance Category	Eligible	Dispensed DMARD	Percent (%)	Proportion	Lower Limit	Upper Limit	Change from 2017
Commercial-Private	286,602	180,803	63.09%	0.6309	0.6291	0.6326	↔
Medicaid Managed Care	144,202	104,981	72.80%	0.7280	0.7257	0.7303	↑
Medicaid-Medicare Dual	236,284	130,858	55.38%	0.5538	0.5518	0.5558	↘
Medicare Advantage	142,522	90,105	63.22%	0.6322	0.6297	0.6347	↘
Medicare Fee-for-Service	374,410	261,052	69.72%	0.6972	0.6958	0.6987	↑

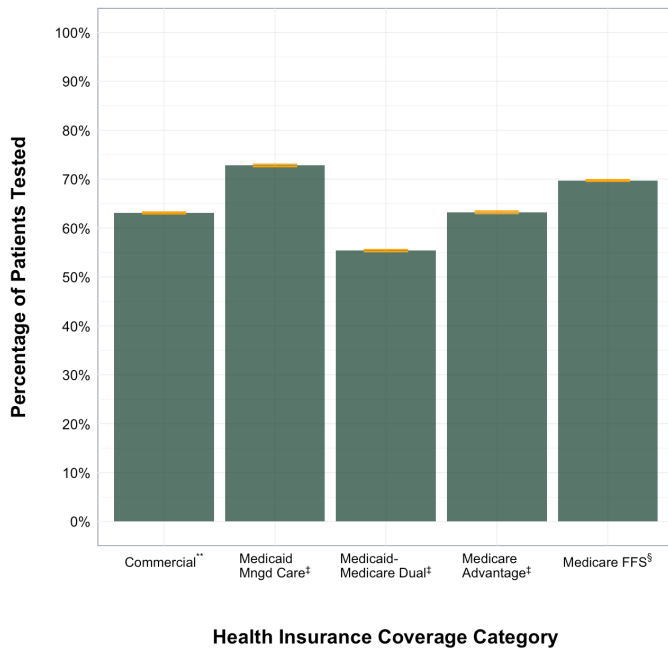
*Table Notes:* \* Confidence Intervals (CIs) for proportions computed using Clopper-Pearson interval method. The 95% confidence level threshold was applied.

In order to estimate the relative strength of the association between Health Insurance Category and DMARD dispense rates and to determine if the variations that we observed were statistically significant, we performed additional analysis. We treated the Medicaid-Medicare Dual category (lowest DMARD dispense rate) as our base reference and did a pairwise comparison of the probability of being prescribed **and** dispensed a DMARD for management of rheumatoid arthritis. This pairwise analysis is referred to as the *relative risk* or *risk ratio* and is defined as the ratio of the probability of a specific outcome in one group compared to another group. It attempts to answer the following specific questions:

*Compared to patients in the Medicaid-Medicare Dual category, how much more likely were patients to be prescribed and dispensed at least one DMARD agent during the measurement period if they were in each of the following coverage categories:*

- *Commercial-Private*
- *Medicaid Managed Care*
- *Medicare Advantage*
- *Medicare Fee-for-Service*

<sup>3</sup> E.g., Medicaid Managed Care vs. Commercial; Medicaid Managed Care vs. Medicare Advantage; Medicaid vs. Dual; Commercial vs. Medicare Advantage, etc.



**Figure 4.** Graphic representation of Table 1 results. DMARD dispense rates for **Measurement Year 2018**, segmented by health insurance coverage category. Orange bars represent confidence intervals.

Notes: See additional notes associated with Table 1

\*\* Signifies a mix of indemnity and managed care product types, including PPO, HMO and EPO.

† Signifies exclusively a managed care product type.

§ Signifies exclusively indemnity product type (not managed care).

Although the use of the term *risk* might suggest that the event or outcome is harmful or undesirable, in this case, the event of interest is a prescription medication dispense event. As summarized in Table 3, we found that compared to rheumatoid arthritis (RA) patients enrolled in a Medicaid-Medicare Dual eligibility plan, Medicaid Managed Care patients were 1.3 times more likely to be dispensed a DMARD; Medicare Fee-for-Service patients were 1.25 times more likely to be dispensed a DMARD; Commercial-Private insurance patients and Medicare Advantage patients were approximately equally likely to be dispensed a DMARD.

**Table 4.** Risk Ratio of DMARD dispensing comparing Medicaid-Medicare Dual to other coverage categories. Refer to text for detailed explanation and interpretation of risk ratios. Using Medicaid Managed Care as the exemplar, all differences were statistically highly significant with  $p < 0.001$ .

Health Insurance Category	Risk Ratio Estimate	Lower Limit	Upper Limit	Confidence Level *
Medicaid-Medicare Dual	1	NA	NA	0.95
Commercial	1.14 †	1.13	1.14	0.95
Medicare Advantage	1.14 †	1.14	1.15	0.95
Medicare Fee-for-Service	1.25 †	1.25	1.26	0.95
Medicaid Managed Care	1.31 †	1.31	1.32	0.95

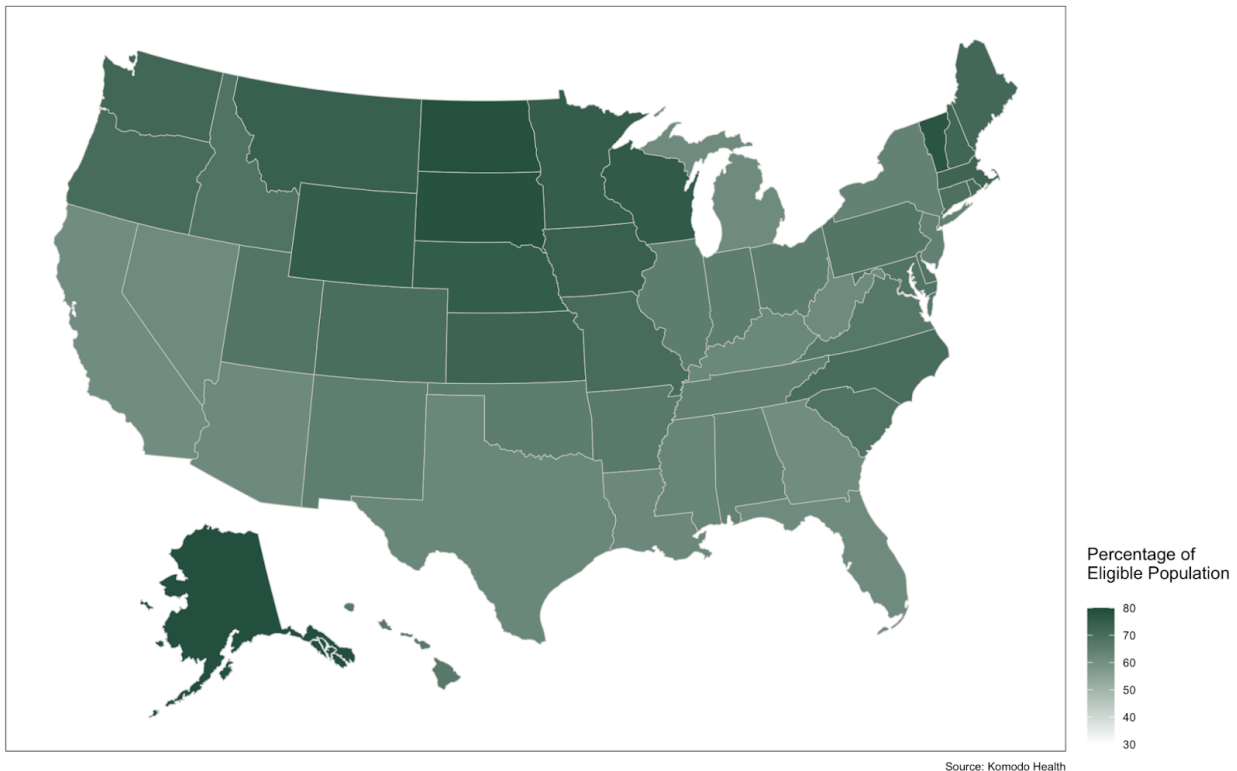
† Difference is statistically significant with  $p\text{-value} < 0.001$ . Test statistic is a z-score (z) defined by the following equation:  $*z = (p1 - p2) / SE*$  and used to compare two observed proportions.

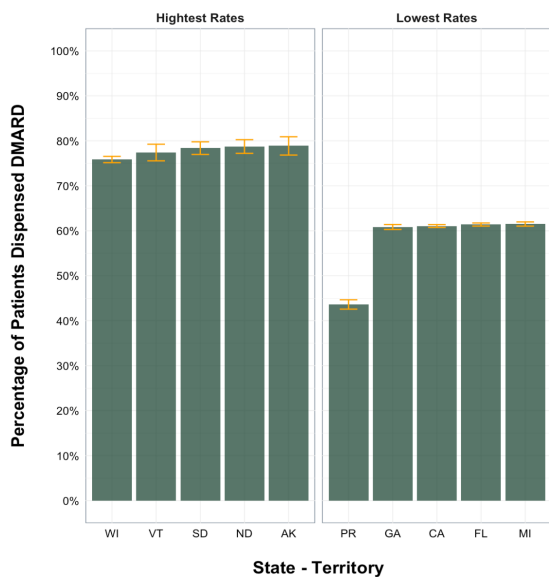
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### **Variations in DMARD Dispense Rates Based on State or Territory of Residence**

Komodo observed variations in DMARD dispense rates as a function of a patient’s state or territory of residence. After uniquely assigning each patient to one and only one state or territory of residence, Komodo then grouped patients from all health insurance categories together and recalculated DMARD dispense rates for each state or territory. As was the case in 2017, the dispense rates were lowest for patients in the Commonwealth of Puerto Rico, where only 43.62% of the 8,842 patients meeting inclusion/exclusion criteria were dispensed at least one DMARD agent during the measurement period. While DMARD dispense rates for patients in the Commonwealth of Puerto Rico continue to lag significantly compared to patients in other states, the gap has closed somewhat compared to measurement year 2017, when Puerto Rico had a dispense rate of ~ 28% for eligible patients. In **Measurement Year 2018**, we observed a 35.3% difference between the five states with the highest DMARD dispense rates (North Dakota, Alaska, South Dakota, Vermont and Wisconsin) and the state/territory with the lowest DMARD dispense rate (Puerto Rico). We confirmed that sample size for each state and territory was sufficiently large to detect significant differences in proportion using methods of Fleiss, Tytun, and Ury. Results are summarized in Figures 5 and 6 below. Rates for each state are summarized in Table 5.

**Figure 5.** Heatmap representation of DMARD dispense rates by state-territory. Patients from all health insurance categories were aggregated. Power and sample size for each state were assessed retrospectively and determined to be sufficiently large to detect significant differences in proportion. Note: Puerto Rico is not displayed on the heat map but results are reported in Table 5.





**Figure 6.** Graphic representation of DMARD dispense rates by state-territory. Patients from all health insurance categories were aggregated. The five states- territories with the highest dispense rates are compared to the five states-territories with lowest dispense rates. Orange bars represent confidence intervals.

**Table 5:** Complete list of DMARD dispense rates by state-territory for Measurement Year 2018. Patients from all health insurance categories were aggregated. Cohort size from U.S. territories was not sufficiently powered to support analysis.

State - Territory	Dispense Rate *	State - Territory	Dispense Rate	State - Territory	Dispense Rate
Alaska	78.92%	Louisiana	62.29%	Oklahoma	65.17%
Alabama	64.07%	Massachusetts	72.71%	Oregon	70.49%
Arkansas	66.53%	Maryland	68.20%	Pennsylvania	67.74%
Arizona	61.75%	Maine	71.70%	Puerto Rico	43.62%
California	61.06%	Michigan	61.51%	Rhode Island	71.20%
Colorado	70.04%	Minnesota	74.98%	South Carolina	68.54%
Connecticut	69.36%	Missouri	70.49%	South Dakota	78.40%
District of Columbia	62.64%	Mississippi	62.99%	Tennessee	64.59%
Delaware	68.17%	Montana	74.01%	Texas	62.44%
Florida	61.39%	North Carolina	70.21%	Utah	67.88%
Georgia	60.84%	North Dakota	78.77%	Virginia	67.08%
Hawaii	66.69%	Nebraska	75.17%	Vermont	77.44%
Iowa	74.31%	New Hampshire	72.24%	Washington	72.07%

Idaho	68.38%	New Jersey	64.37%	Wisconsin	75.85%
Illinois	65.35%	New Mexico	65.02%	West Virginia	61.58%
Indiana	65.35%	Nevada	61.60%	Wyoming	75.20%
Kansas	73.00%	New York	64.05%		
Kentucky	62.19%	Ohio	65.44%		

## Discussion of Findings

Komodo Health uses its comprehensive all-payer data assets to measure important indicators of clinical-effectiveness, cost-effectiveness and equity of access to high-quality and evidence-based healthcare across a diverse set of patients, providers and healthcare systems. Our objectives are to provide stakeholders with additional and potentially actionable insights relating to variations in quality or effectiveness of care. In the analysis reported here, we evaluated dispense rates of DMARD among patients in the United States diagnosed with Rheumatoid Arthritis as an important indicator of quality and the use of evidence-based healthcare processes for patients with serious and chronic health conditions. Three factors enabled us to conduct a unique comparative analysis and detect important variations across regions and payer types. First, Komodo was able to evaluate a relatively large number of patients on whom we had a complete longitudinal record of clinical encounters and prescription drug use. Second, the number of evaluable patients in each of the Commercial, Medicaid and Medicare health insurance coverage categories was sufficiently large that the results of the payer segmented analysis were statistically supported. Finally, the national coverage was complete and the number of evaluable patients in each of the individual states, Puerto Rico and the District of Columbia was sufficiently large that the results of the state segmented analysis were statistically supported.

With respect to demographics of the eligible population, the observations in Measurement Year 2018 are consistent with our understanding of the condition in the United States. The sex/gender and age distributions that we observed in this rheumatoid arthritis measurement population are consistent with distributions reported in the peer-reviewed literature and public health registries and in a prior public report released by Komodo Health. Population-based research studies using claims data, disease registries and public health surveys consistently report female-to-male sex/gender ratios ranging from approximately 2:1 to 3:1, and this is consistent with our observations in this measurement population.

Our analysis revealed statistically significant variations in DMARD dispense rates in association with specific health insurance categories. However, the 2018 Measurement Year reveals significant improvement in DMARD dispense rate in the Medicaid Managed Care patients cohort. In the 2017 measurement year, this cohort of patients demonstrated the lowest dispense rates compared to Commercial cohorts and cohorts covered under a Medicare Part D benefit. One possible explanation

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for improved DMARD dispense rates in the Medicaid Managed Care population is the entrance of new agents including biological original (boDMARDs), biosimilar DMARDs (bsDMARDs) and targeted synthetic DMARDs (tsDMARDs) to formularies, augmenting the oral conventional synthetic disease-modifying antirheumatic drugs (csDMARDs). Komodo Health is in the process of conducting a detailed analysis of formulary coverage, adherence and differential dispensing activity between csDMARDs, tsDMARDs and bsDMARDs.

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### **Statistical Analysis**

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## Appendix 1: HEDIS® Measure Specifications

### Rheumatoid Arthritis: Disease Modifying Anti-Rheumatic Drug (DMARD) Therapy

**NQF ENDORSEMENT STATUS:** NQF-Endorsed

**NQF ID:** 0054

**MEASURE TYPE:** Process

Measure Description	
The percentage of beneficiaries 18 years of age and older who were diagnosed with rheumatoid arthritis and who were dispensed at least one ambulatory prescription for a disease-modifying anti-rheumatic drug (DMARD).	
Measurement Period (Year in which utilization events occurred)	
2018	
Eligible Population	
<b>Product lines</b>	Commercial, Medicaid, Medicare (report each product line separately).
<b>Ages</b>	18 years and older as of December 31 of the measurement year.
<b>Continuous enrollment</b>	The measurement year.
<b>Allowable gap</b>	No more than one gap in enrollment of up to 45 days. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
<b>Anchor date</b>	December 31 of the measurement year.
<b>Benefits</b>	Medical and pharmacy.
<b>Event/ diagnosis</b>	Two of the following with different dates of service on or between January 1 and November 30 of the measurement year. Visit type need not be the same for the two visits. <ul style="list-style-type: none"> <li>• Outpatient visit (HEDIS® Outpatient Value Set), with any diagnosis of rheumatoid arthritis (HEDIS® Rheumatoid Arthritis Value Set).</li> <li>• Nonacute inpatient discharge, with any diagnosis of rheumatoid arthritis (HEDIS® Rheumatoid Arthritis Value Set). To identify non acute inpatient discharges: <ol style="list-style-type: none"> <li>1. Identify all acute and nonacute inpatient stays (HEDIS® Inpatient Stay Value Set).</li> <li>2. Confirm the stay was for non acute care based on the presence of a non acute code (HEDIS® Non Acute Inpatient Stay Value Set) on the claim.</li> <li>3. Identify the discharge date for the stay.</li> </ol> </li> </ul>

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## Specifications

**Denominator** The eligible population

**Numerator** Beneficiaries who had at least one ambulatory prescription dispensed for a DMARD during the measurement year. There are two ways to identify members who received a DMARD: by claim/encounter data and by pharmacy data. The organization may use both methods to identify the numerator, but a member need only be identified by one method to be included in the numerator.

*Claim/encounter data.* A DMARD prescription (HEDIS® DMARD Value Set) during the measurement year.

*Pharmacy data.* Members who were dispensed a DMARD during the measurement year on an ambulatory basis (HEDIS® DMARD Medications List).

## Exclusions

- Beneficiaries with a diagnosis of HIV (HEDIS® HIV Value Set; HIV Type 2 Value Set) any time during the member's history through December 31 of the measurement year.
- Female beneficiaries with a diagnosis of pregnancy (HEDIS® Pregnancy Value Set) any time during the measurement year.
- Beneficiaries who are in hospice at any time during the measurement period

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## Appendix 2: Glossary of Terms and Abbreviations

**CDC.** Centers for Disease Control and Prevention.

**CMS.** Centers for Medicare & Medicaid Services.

**Coverage.** A term used by healthcare insurers and health plan sponsors to refer to enrollment and continued eligibility for a specific, defined set of healthcare benefits. Coverage can be segmented into *medical benefit coverage*, *prescription drug benefit coverage*, and possible other subsets of healthcare benefits. In the case of employer-sponsored health insurance benefits, eligibility and enrollment is based on employment status with an employer-sponsor and election into a specific benefit. In the case of Medicaid, eligibility and enrollment is based on residency in the state that is sponsoring the health benefit, combined with other criteria such as income, gender, disability status, possibly work status, and other state-specific criteria. In the case of Medicare, eligibility and enrollment is based on age and disability status or end-stage renal disease status; for some benefits, eligibility and enrollment also requires election into and purchase of a specific benefit.

**HEDIS.**<sup>®</sup> Healthcare Effectiveness Data and Information Set. A set of standard metrics quantified using data and designed to measure quality across 6 domains of care: Effectiveness of Care, Access/Availability of Care, Experience of Care, Utilization and Risk-Adjusted Utilization, Health Plan Descriptive Information, Measures Collected Using Electronic Clinical Data Systems.

**National Quality Forum.** A non-profit membership organization that reviews, validates, and provides expert consensus endorsement of specific healthcare quality metrics. See <http://www.qualityforum.org/Home.aspx>.

**Prevalence.** A measure of how common a disease or condition is in the population at a given time.

**Medicaid.** A joint federal- and state-sponsored health insurance program that provides healthcare coverage to eligible low-income adults, children, pregnant women, elderly adults, and people with disabilities. Medicaid is often used to refer to a collection of distinct programs that includes Medicaid fee-for-service, Medicaid Managed Care, Medical Assistance, and Children's Health Insurance Plan (CHIP). It also includes patients, referred to as "dual eligibles," who concurrently qualify for benefits covered under both the Medicare and Medicaid plans.

**Employer-Sponsored Coverage.** Health insurance or a healthcare benefit offered to a person as a benefit relating to their employment status or the employment status of a spouse, parent, or civil partner.