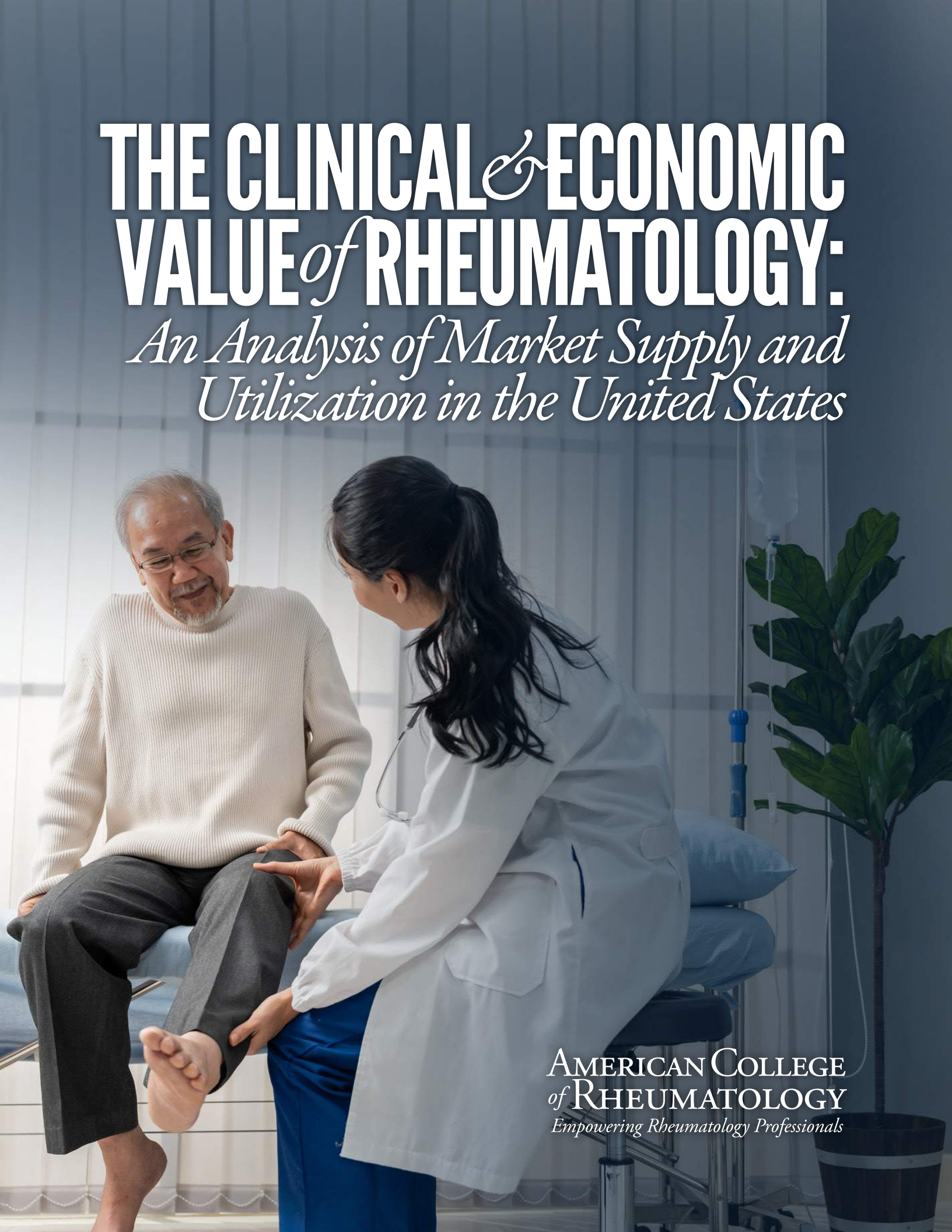
THE CLINICAL & ECONOMIC VALUE of RHEUMATOLOGY:

An Analysis of Market Supply and Utilization in the United States



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The Clinical and Economic Value of Rheumatology: An Analysis of Market Supply and Utilization in the United States

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TAKE HOME POINTS:

- Previous literature has shown that care by rheumatologists:
  - Decreases rheumatoid arthritis related long term disability and frequency of total hip and knee replacements
  - Reduces 30-day re-admission rates in patients with Systemic Lupus Erythematosus (SLE) upon discharge from the hospital
  - Reduces flare rate of patients with gout
- This analysis demonstrated:
  - A higher supply of rheumatologists led to a reduction in emergency room (ER) costs and hospitalization costs per patient
  - A lower supply of rheumatologists in an area leads to higher spending per patient per year
  - An average of direct billings per rheumatologist of $3.5 million per year

Introduction/Background

Rheumatologists play a critical role in the management of patients with rheumatic and musculoskeletal diseases and have an important and financially viable role in healthcare systems. This paper will briefly review the wide-ranging impact that a rheumatologist has on the health of their patients and subsequently present an analysis of the economic benefits of care by a rheumatologist.

Rheumatologists care for high acuity patients with chronic, complex conditions such as rheumatoid arthritis, systemic lupus, vasculitis, myositis and others [1]. Rheumatoid arthritis (RA) is the most common chronic, autoimmune inflammatory arthritis and is associated with significant comorbidities such as cardiovascular disease, increased risk of infection, RA associated lung disease, decline in functional capacity, decline in psychosocial health, increased risk of lymphoma, and decreased overall survival [2,3,4,5]. RA can be severely disabling when ineffectively treated or unresponsive to therapy resulting in decline in functional status and participation in the workforce [6,7]. Appropriate medical therapy with disease modifying anti-rheumatic drugs (DMARDs) or biologics provided by rheumatologists can significantly decrease disease activity, modify comorbidities, and improve quality of life for those affected by RA [8, 9, 10]. “Treat to target” strategies, where treatment is escalated to a goal of low disease activity or remission, has become the standard of care [11, 12].

In addition to clinical improvement in physical function, aggressive treatment for RA has been shown to decrease clinically important vascular inflammation in RA and reduce cardiovascular risk of events overall [13, 14, 15]. Reducing cardiovascular events in RA patients significantly improves the overall quality of life and decreases health care costs. Similarly, more aggressive treatment for RA has shown benefits in long term joint health. The introduction of biologic therapy has been proven to reduce the incidence of hip and knee replacements in patients with RA despite their overall rise in the general population [16]. In a recent Canadian study, there was a 26.9 percent reduction in total hip replacement and a 12.6 percent reduction in knee replacements for patients with RA after the introduction of biologics. This contrasts with a 11.7 percent increase in total hip and a 16.6 percent increase in knee replacements in osteoarthritis (OA) during the same time period [17]. The significant decline in hip and knee joint replacements results in decreased joint damage, improved physical function, and improved quality of life and further offsets a significant direct cost of joint replacements for individual patients.

Another complex disease where rheumatologists provide quality care for patients is systemic lupus erythematosus (SLE). SLE is among the leading causes of death of young women in the United States with higher disease activity being associated with higher morbidity and mortality [18,19]. Due to the high level of morbidity and mortality in this disease, SLE has one of the highest 30-day hospital readmission rates among chronic diseases in the United States. However, access to a rheumatology clinic post-discharge reduces rates of readmission in this group [20]. Readmission rates for patients with SLE rival those of patients with heart failure and without readily available outpatient rheumatologic care, SLE will negatively impact readmission quality metrics [21]. A driver of high morbidity and mortality in SLE patients is the development of lupus nephritis, which may result in the need for hemodialysis or a kidney transplant. Data has shown that lupus patients with Medicaid are more likely to develop lupus nephritis and yet this population experiences greater barriers to rheumatology access than those with Medicare or commercial insurance [22, 23].

In addition to RA and SLE, patients with gout managed by a rheumatologist have better outcomes as well. Compared to patients managed by a primary care physician, these patients have fewer emergency room visits resulting in considerable cost savings [24, 25, 26, 27, 28]. Rheumatologists are three times more likely to confirm the diagnosis of gout and are more likely to follow published gout guidelines. As a result, patients are more likely to receive appropriate urate lowering therapy, to have prophylaxis to avoid flares associated with urate lowering therapy and require less acute care for gout flares.

Rheumatologists also played a critical role during the recent COVID-19 public health crisis. During the COVID-19 pandemic, task forces of rheumatologists and infectious disease specialists from North America were convened by the American College of Rheumatology to promote guidance for optimal care of adult and pediatric patients with rheumatic disease during the pandemic [29, 30]. Once COVID-19 vaccines were available in 2021, a task force provided timely vaccination guidance for adult patients with rheumatic diseases [31]. Characteristics of rheumatic disease patients hospitalized with COVID-19 were rapidly shared by a global rheumatology alliance to optimally treat these infected patients [32]. In addition to the guidance and care that rheumatologists provided to patients with rheumatic diseases, their expertise in the treatment of patients with systemic inflammation and skills in prescribing immune modulating therapy meant that they were called on to assist in the care of the most critically ill patients with COVID-19 [33].

Like all physicians, rheumatologists have a critical impact on the local and national economy. The national economic impact of physicians at state and federal levels has been quantified with metrics on output, the creation of jobs, wages and benefits to society, and the large-scale support for state and federal tax revenue. In 2018, the total number of US physicians providing patient care generated 12.6 million total jobs (average of 17.1 direct and indirect jobs per physician), $1 trillion total wages and benefits, and $92.9 billion in total state and tax revenue [34]. Independent university rheumatology practices have also analyzed and justified the local economic impact through data points, such as job creation and downstream revenue benefits [35]. Therefore, the healthcare system as a whole and rheumatology care in specific should not be perceived simply as ‘billing for fees and services’ but should be appreciated as providing significant ‘revenue enhancement’ for society.

A final but highly important component for evaluating rheumatology care is measuring quality of care. As the US moves from a fee-for-service to a fee-for-value system, healthcare systems are shifting their focus from short term gains to investments which will lower healthcare costs, increase quality of care, and help people lead healthier lives. Rheumatologists have developed electronic registries, such as the Rheumatology Informatics System for Effectiveness (RISE), to track and improve the quality of care administered by rheumatologists across the

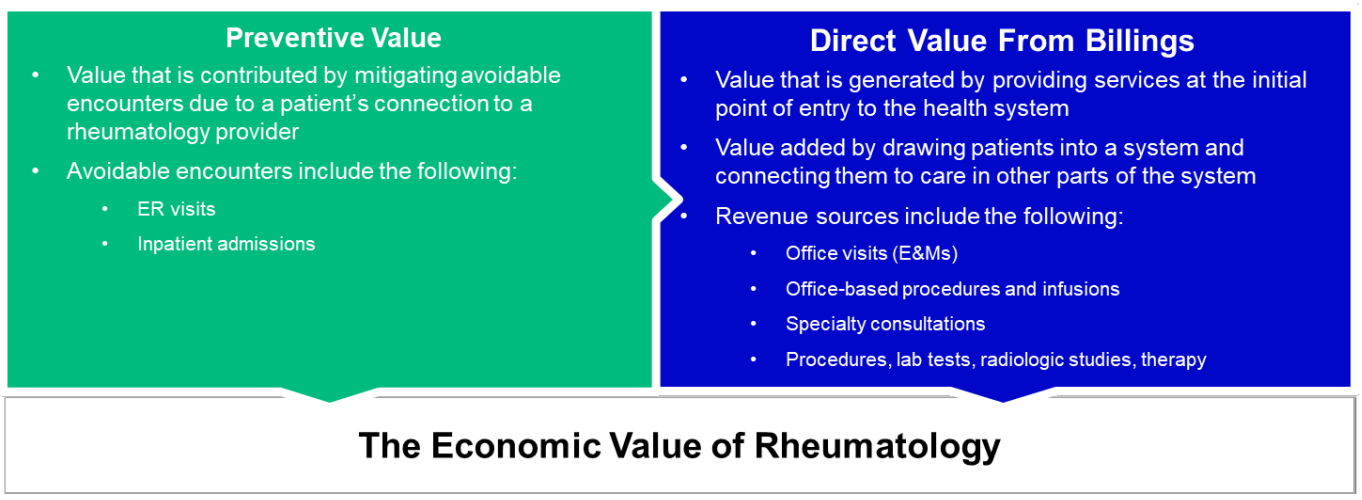
country. This registry provides timely feedback on performance of 24 different quality metrics including functional status and receipt of DMARD prescriptions for RA patients. Rheumatologists have consistently performed so well (>90%) on the former that it has been retired from the Merit-Based Incentive Payment System program [37]. Another such way that healthcare systems demonstrate the quality of care provided is by joining an Accountable Care Organization (ACO), where payment is tied to quality outcomes such as hospital readmissions, adverse events, and population health. The benefit that rheumatologists bring by providing specialized care, such as reduced emergency room visits, reduced hospital readmissions, and modified morbidity and mortality, contribute significantly to adding value to patient care and increased quality within hospital systems.

Rheumatologists provide benefits to individual patients and healthcare systems in the form of better outcomes, meeting of quality metrics, preventing disability from end stage joint disease and cardiovascular disease, reducing the need for care in higher cost settings and reducing hospital readmissions for some patients. The goal of this work is to highlight the benefits of establishing a appropriate supply of rheumatologists within a healthcare system.

Methodology

To understand the economic value a rheumatologist adds to a health system, the ACR partnered with ECG Management Consultants (ECG) to conduct a business analysis retrospectively analyzing adjusted insurance claims data to gain insights into specific geographic markets and medical groups. For this analysis, the economic value of a rheumatologist is defined as a combination of two financial buckets; preventive value, defined as the cost savings from reducing care in emergency rooms and inpatient admission mitigation and direct value defined as the billings generated from encounters with a rheumatologist. The direct value was calculated by summing revenue sources from fee for service care including evaluation and management codes and office-based procedures, infusions, and any additional contacts a patient has with the health system as a direct result of receiving care from a rheumatologist. This includes lab testing, radiology services, physical and occupational therapy referrals and other procedures and consultations (see Figure 1). For the purposes of this study, rheumatologist is defined as an MD or DO and did not include advanced practice practitioners.

FIGURE 1: Defining the Economic Value of Rheumatology



To determine the preventive value, as defined by the cost savings of preventing care utilization at either emergency rooms (ER) or inpatient settings for patients associated with a rheumatologist's care, ECG conducted analysis comparing and contrasting care rendered in each quadrant defined in Figure 2. In each market, ECG compiled lists of patients seen by a rheumatologist in 2019, 2020, or 2021. Based on a unique patient identifier, each attributed patient's subsequent ER encounters and hospitalizations were tracked for 2021. Costs for an average ER visit and hospital inpatient encounter were based on reports from the Medicare Cost Report and Kaiser Family Foundation. For each market, total ER and inpatient stays per attributed patient were multiplied by average cost data, aggregated, and averaged to obtain a per patient value in each market (see Figure 3).

FIGURE 2: Market Criteria Quadrant Definitions

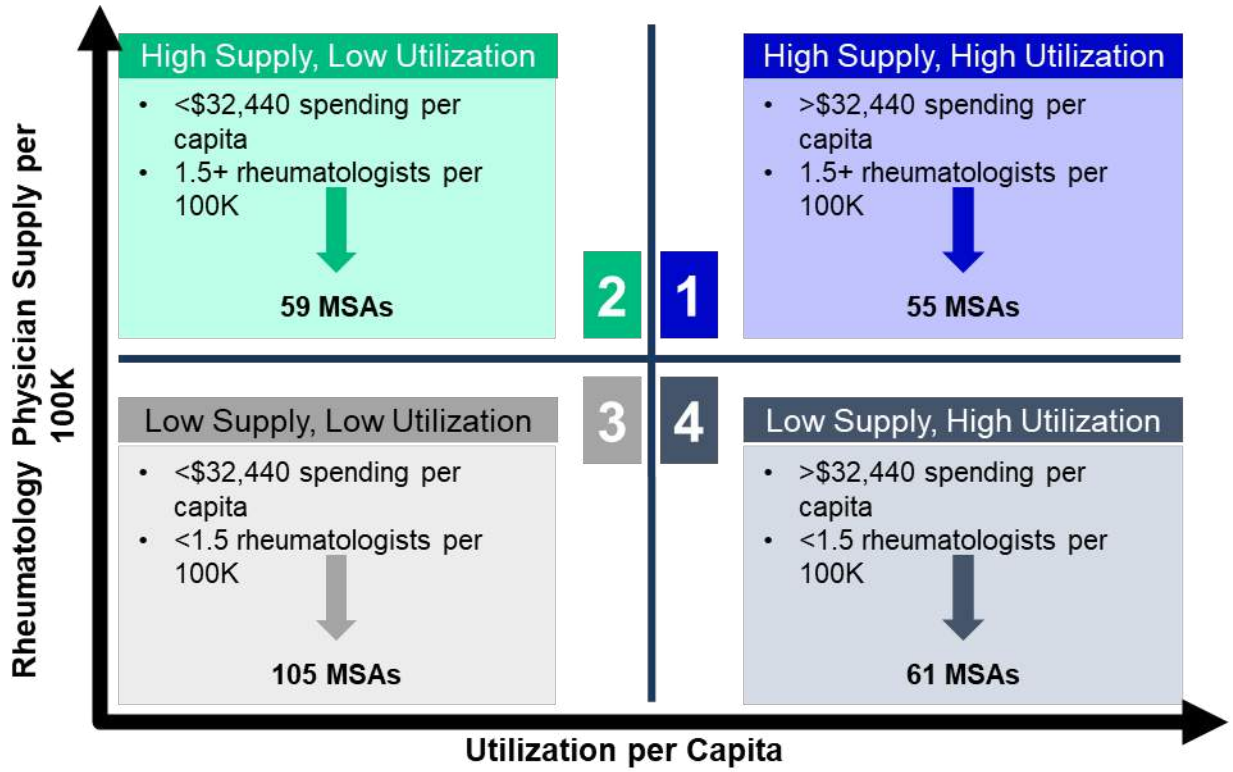
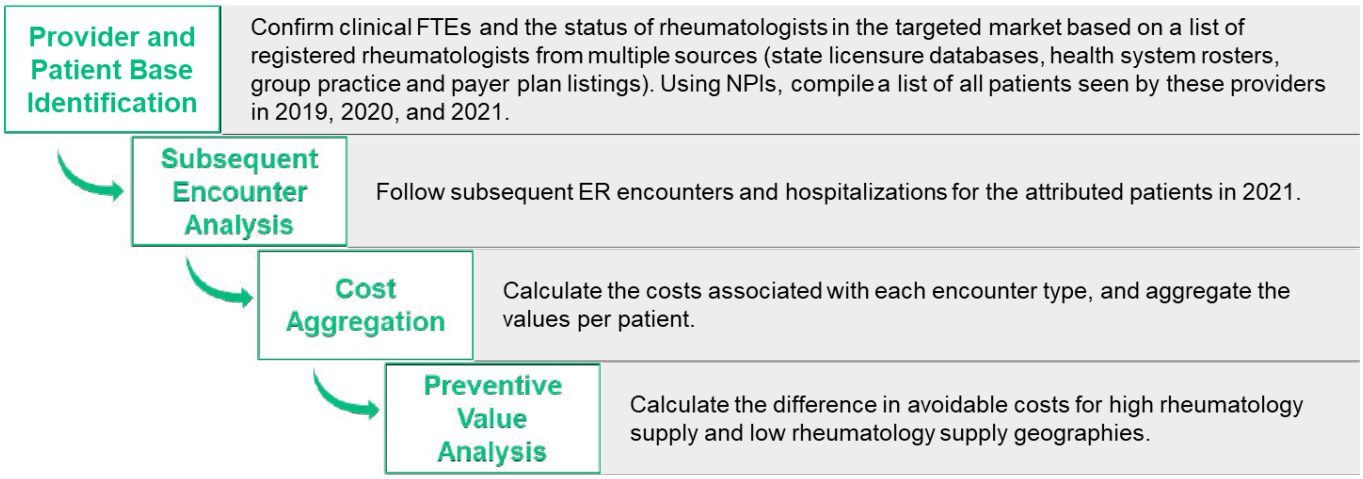


FIGURE 3: Preventive Value Methodology



To these ends, ECG compared markets with a high supply of rheumatologists to markets with a low supply of rheumatologists, which were normalized for per capita utilization. A high supply of rheumatologists was defined as the presence of 1.5 clinical FTE rheumatologists per 100,000 population and a low supply of rheumatologists was below this threshold. Subscription-based claims data were used to track individual providers and patient level data which included provider, facility, and patient information to understand rheumatology utilization patterns. Individual rheumatologists included in the analysis were identified based on National Provider Identifier (NPI) number, state licensure databases, health system rosters, group practice and payer plan listings and clinical full-time equivalents (FTE) validated by phone calls to ensure representative accuracy. Patient/encounter level data included in the analysis was extracted from the claims data based on the following process: identification of rheumatology patients based on provider NPI and unique patient identifiers who were seen by a rheumatologist in 2019, 2020 and 2021. Subsequent encounters were included in the analysis based on patient identifier for the year 2021. These years were chosen as they were readily available in the claims database.

The database collects clearinghouse data to develop an all-payer claims database with approximately 72% coverage of the total US population. Due to the reliance on clearinghouse data, certain data points were left out of the analysis, most notably traditional Medicare fee-for-service claims, Medicaid, self-pay, and any payers that do not use clearinghouses for claims processing (e.g., Kaiser Permanente). The inability to capture a wider representation of claims data is a limitation of this analysis. Given the aim of this analysis, which was to track the billings of individual rheumatologists and their downstream billings for all disease states, disease specific measures were not obtained.

To calculate a dollar amount for preventative value ECG stratified every metropolitan statistical area (MSA) in the United States into four quadrants based on the supply of rheumatology physicians per 100,000 population and the utilization per capita. There are 384 MSAs in the US. Based on high population density defined as at least 50,000 persons, and close economic ties in the area, approximately 83% of the population lives in an MSA. MSAs were classified into one of four categories:

1. High Supply, High Utilization
2. High Supply, Low Utilization
3. Low Supply, Low Utilization
4. Low Supply, High Utilization

Quadrant cutoffs were based on utilization per capita spend above or below $32,440 and a supply of above or below 1.5 rheumatologist FTE per 100,000 population (see Figure 2).

Analysis was conducted at the individual claims level, with a representative market selected from each quadrant. Representative markets were selected for their centrally plotted location within the quadrant to ensure their overall similarity to other markets within the quadrant. The methodology was confirmed by sampling 35 random individual ACR rheumatology physicians to ensure their actual utilization matched their expected market; approximately 70% of the time, these ACR physicians plotted to the quadrant of their home market, as expected. This approach satisfied internal validity measures to ensure the observed results represented accurately the population we are studying, and our findings were not due to methodological errors. This result was satisfactory to the work group, as those that deviated from expected were more likely to have lower utilization of services compared to their expected market and thus would not overestimate the billings generated by an average rheumatologist. This difference was thought to potentially be due to the ACR sampled population being active in non-clinical work such as research, administration or ACR governance.

Contrasting the values across the four markets allowed for a comparison of areas with high supply of rheumatology versus low supply of rheumatology, adjusting for natural market utilization patterns. This number was calculated based on the total ER and hospital inpatient admission costs in each of the four markets divided by the number of patients in each market. The difference in average per patient was then compared in the markets with high supply versus low supply to derive the total savings.

Market utilization is a measure that adjusts for a pattern in health care utilization in a given MSA. It is well established that different markets have a wide variability in health care related utilization and expenditures [38]. It is commonly observed that the undersupply of providers results in higher costs due to delayed diagnosis and treatment requiring higher acuity interventions and due to patient throughput issues like longer wait times and fewer patient/physician interactions [39]. This layer was added to our analysis to better control for regional variability in utilization when comparing regions of higher and lower density of rheumatologists.

Direct value was determined from billing data that was aggregated for both individual provider NPIs and the facility NPIs for activities performed in 2021 and was calculated by summing the total billings attributable to a rheumatology provider on an individual patient level for services referred by the rheumatology provider. Total individual and facility billings were averaged by clinical FTE of these providers to obtain a total direct/downstream value per clinical rheumatologist FTE per year. These include those that directly benefit the affiliated hospital system including provider charges for evaluation and management coded office visits and office-based procedures including ultrasound, inpatient consultations, in-office procedures such as arthrocentesis and office-based infusions during the study period. Also included in this sum are billings for services including laboratory studies, radiologic studies, physical and occupational therapy referrals, referred procedures to other

specialists such as echocardiograms and pulmonary function testing, referrals for orthopedic and other subspecialty consultations and referrals to hospital-based infusion centers including the profits derived from these infusions.

Included in the direct value are infusion billings. Rheumatology practices are frequent prescribers of advanced biologic drugs delivered via infusion centers. However, many rheumatologists practice in academic or health system settings with embedded infusion centers that service a multitude of departments, including oncology, making it difficult to disaggregate rheumatology-attributed costs in adjusted claims. Connecting rheumatology value to drug-related revenue in these settings is complicated from a claims perspective, as reimbursement is frequently tied to the facility or organization, not a provider NPI. In an attempt to quantify billings from infusion services, ECG identified independent rheumatology practices featuring ownership of a freestanding infusion center in each of the four comparison markets.

Results

Across the four MSA quadrants, the highest number of patients was 28,418 (low supply, high utilization) and the lowest was 14,140 (high supply, low utilization). The highest concentration of rheumatologists was 2.3 per 100,000 and the lowest was 0.9 per 100,000. The average cost per patient per ER visits was found to range from $2,751 to $5,636. Hospitalization cost averages per incident per patient ranged from $5,840 to $14,455 (see Figure 4). In markets with a high supply of rheumatologists, ER visits and hospitalizations accounted for an average of $2,882 and $9,542 per patient per year respectively. In markets with a low supply of rheumatologists, these numbers were found to be $4,194 and $10,992. In total, across avoided ERD costs and hospital admissions, the preventive value per patient of rheumatology was found to be $2,762 per patient per year (see Figure 5). This amount represents the preventative value of having a high supply of rheumatologists versus having a low supply of rheumatologists.

FIGURE 4: Preventive Value Analytic Findings, by Market

Description	High Supply, High Utilization	High Supply, Low Utilization	Low Supply, Low Utilization	Low Supply, High Utilization
Number of Patients	18,048	14,140	21,013	28,418
Rheumatologists per 100,000 Population	2.3	2.2	0.9	1.2
Encounters per Patient				
ER Visits	1.5	1.4	1.4	2.8
Hospitalizations	4.6	2.0	2.6	5.0
Costs				
Total ER Visit Cost	$53,356,256	$39,705,280	$57,816,496	$160,172,400
Total Hospitalization Cost	$239,033,600	$82,584,385	$158,216,110	$410,781,540
Average Cost per Patient: ER Visits	$2,956	$2,808	$2,751	$5,636
Average Cost per Patient: Hospitalizations	$13,244	$5,840	$7,529	$14,455

FIGURE 5: Total Preventive Costs Per Patient Per Year, High versus Low Supply of Rheumatology

Description	High Supply	Low Supply	Preventive Value per Patient
Legend	A	B	C = B – A
ER Visits	$2,882	$4,194	$1,312
Hospitalizations	$9,542	$10,992	$1,450
Total			**$2,762**

In MSAs with low rheumatology supply for both low and high utilization, the average group consisted of 26.7 clinical FTE compared to a high rheumatology supply MSA with either high or low utilization of just 4.05 clinical FTE per group. This may represent consolidation of physician practices to increase their referral base, to protect their market share and/or to increase their revenues [31]. This may partially explain the disparities of facility drug total billings in the low versus high rheumatology supply areas; an average of $31.3M vs. an average of $2.8M. If a rheumatologist is affiliated with a large health system with an infusion center on site, it may be more difficult to track those billings back to the rheumatologist, whereas if an independent rheumatologist refers to an outside infusion center those billings may be easier to associate with a single NPI as explained in the methods section. Known regional differences in practice patterns and resource utilization are other explanations for the large differences in billings across quadrants.

Direct billings attributable to a rheumatology NPI for services rendered aside from infusion billings in the low supply areas ranged from $25.3M to $64.9M and in the high supply areas ranged from $1.9M to $6.6M. Per clinical FTE this becomes $1.7M to $4.1M in the low supply areas and $737,184 and $2M in the high supply areas. Downstream and direct revenue varied across markets, with the highest billings found in markets with low rheumatology supply and the lowest values in markets with high rheumatology supply. In total, the average annual direct and downstream/drug billings associated with a rheumatologist clinical FTE was found to be $3.5 million (Figure 6).

FIGURE 6: Direct and Downstream Value

Rheumatology Supply per 100,000	Utilization Per Capita	Group Clinical FTE	Facility Drug Total	Provider Total	Total Billings, Adjusted	Total Billings per Clinical FTE
Low	High	26.0	$30.3M	$64.9M	$157.0M	$6.0M
Low	Low	27.4	$32.3M	$25.3M	$105.4M	$3.9M
High	High	3.9	$4.7M	$6.6M	$11.3M	$2.9M
High	Low	4.2	$0.9M	$1.9M	$4.5M	$1.1M

Average Annual Direct/Downstream Value Per Rheumatologist = $3.5M

Note: Dollars represent total billings in 2021, adjusted by market claims coverage. Clinical FTE verified in 2022.

Discussion

It is easier to appreciate the clinical value of a rheumatologist in practice and through research studies that show positive outcomes, rather than simply by looking at the economic value of the Evaluation and Management codes they generate. The rationale for this business analysis was to compare areas with a high supply of rheumatologists to areas of a low supply of rheumatologists to assess trends in total rheumatology care costs and preventive cost savings based on the methodology. The business analysis can also provide insight into the economic impact and economic value of a rheumatologist in the community.

In our work, when ER visits and hospitalizations were analyzed, areas with a higher supply of rheumatologists were found to have relative cost savings when compared to areas with lower supply of rheumatologists. The analysis also shows notable financial productivity per FTE, even when infusion revenue is not included. As predicted by prior literature, revenue per FTE varies based on rheumatologist supply and regional utilization trends. The highest total billings per clinical FTE were found in markets with a low supply of rheumatologists, meaning that more money is spent per FTE in regions with fewer rheumatologists. This holds true even for markets where there was a difference in utilization per capita. For MSAs with a low supply of rheumatologists, there was a spend of $6.0M in high utilization and $3.9M being spent in low utilization. In areas with a higher concentration of rheumatologists, the total spend is much lower, dropping to $2.9M in the high utilization markets and $1.1M in the low utilization markets. The significant variation in healthcare utilization is consistent with established utilization patterns described in the Dartmouth atlas [42].

Our analysis also found that a lower supply of rheumatologists increases drug infusion revenue per FTE regardless of utilization pattern. The exact reason behind this is unclear but it could be hypothesized that lower density of rheumatologists led to higher levels of infusion owned revenue. This further supports the idea that a lower supply of providers generally results in higher health care costs [39]. Comparing outpatient prescribing habits could have provided more insight into drug spending in low supply areas.

Our direct billing analysis assessed freestanding infusion centers owned by a rheumatologist to more accurately pinpoint the billings of individual rheumatologists and to separate billings from infusion revenue. The infusion drug billings in smaller practices were found to be markedly less than those in very large group practices. There is no clear reason behind this finding, but one hypothesis could be due to the possibility that infusion centers in large practices could provide services to other specialties such as oncology, gastroenterology, primary care, infectious disease, and others. In this way, the attribution of infusions to a single provider (or group of providers) may inflate the billings for a single provider. Similarly, the dollar amount found for smaller practices, an average of $2.8M, may represent the billings that can be attributable to rheumatology physicians directly. Other possibilities of the marked difference could be due to local (and individual) prescribing patterns, ease of infusion access, or coverage variability. It is important to note that the dollar values listed here are for revenue and do not account for expenses.

While this analysis provides insight into trends into the economic impact of having a rheumatologist involved in the care of a patient, it does have limitations. The most notable being the years selected for representation of rheumatology practice overlapping with a global pandemic which changed the way healthcare was delivered for nearly all physicians. These years were chosen for their availability and completeness in data. During the global COVID 19 pandemic telehealth services were adopted and implemented at a speed that is not typically seen in the healthcare sector. This has improved access for some and hindered it for others during the global health crisis that started in early 2020 and has persisted with the writing of this paper.

Another large limitation of this analysis is the lack of Medicare and Medicaid data, which exclude large swaths of those at the extremes of age (children and adults aged greater than 65 years). Data limitations around Medicaid claims made the inclusion of pediatric patients in this analysis challenging and all data that are presented are from adult patients. Understanding the unique needs of the pediatric and Medicare aged rheumatology population would add to the overall value and help to predict future community needs. Due to typically higher levels of Medicare and Medicaid payers seen in rheumatology practices, as well as the contribution to infusion drug revenue, it may be helpful to consider the impact of rheumatology to a facility's 340B drug program, as well as other disproportionate share funding streams. These analyses are difficult to conduct as 340B pricing is proprietary and not publicly available.

Finally, the authors looked for independent groups that were in the representative quadrant based on rheumatology supply and utilization with no association with a health system or academic system and who owned a stand-alone, rheumatology only infusion center. The data garnered are from independent rheumatologists who own an infusion center. While this data is important in the analysis of the economic impact of rheumatologic care, studies have estimated approximately 50% of physicians are employed by a large health systems (including academic health centers), limiting the generalizability of this analysis study [43].

The strengths of the business analysis involved the comparison of areas with a high supply of rheumatologists to areas with a low supply of rheumatologists and trends of cost spending and cost savings. These observations support that an undersupply of rheumatologists resulted in higher costs overall. The study attempted to control for understanding infusion costs per rheumatologist FTE by focusing on rheumatology practices with infusion services and infusion center costs that would have included infusion revenues from multiple sub-specialties. Although the analysis had significant limitations in some claims data (i.e., Medicare, Medicaid, 340B program, etc.), the analysis demonstrates valuable trends in rheumatology spending and revenue enhancement for communities throughout the U.S. supporting the economic value of a rheumatologist. This business analysis further supports the benefit and the need for more rheumatologists in low supply or underserved regions. The higher supply of rheumatologists decreases the overall cost of rheumatology care for many possible reasons. Lastly, utilization of care per capita in this analysis was consistent with variable utilization practices previously described and was generally unrelated to high or low supply of rheumatologists.

While rheumatologists provide a superior quality of care for patients with rheumatic diseases, as defined by disease specific outcomes as shown in the introduction, there are areas in need of improvement. Specifically, health outcomes disparities exist even among patients who receive subspecialty care from a rheumatologist. Data from the nationwide RISE registry has shown that patients with RA who live in an area with the highest levels of area deprivation index (a proxy for low socioeconomic status) have the poorest functional status outcomes as measured by validated measures designed to capture this outcome [44]. In this analysis, no adjustments were made for socioeconomic or demographic factors that may influence utilization patterns, acuity, or patient needs. It is also important to note that billings do not equal collections and the total billings generated by a rheumatologist does not equal the dollar amount a health system should expect to collect from rheumatology evaluation and management services.

The healthcare industry and patient care have been evolving and have improved overall, but the "value" as determined by healthcare systems, by rheumatologists and by the patients are not equally prioritized or equitable. Patients and practicing physicians can readily appreciate the clinical value that a rheumatologist provides for diagnosis, treatment, and better outcomes for rheumatic diseases. The AMA study highlights the impact of physicians, including rheumatologists, on the overall economy. [34] Our business analysis comparing high and low rheumatologist supply with cost spending and revenue enhancement also supports the economic value of a rheumatologist in the community.

We should strive toward a value-based healthcare model that is equitable and sustainable with transparent use of available resources to achieve better outcomes and experiences for every person [45]. It is also important to maintain the wellness of the rheumatology health care team with thoughtful teamwork to prevent burnout [46]. The goals of lower costs and better outcomes with improved access to care for all patients includes noble principles that the American College of Rheumatology strongly values [47].

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Market Definitions by Quadrant

The Value of Rheumatology
Attachment A

American College of Rheumatology

October 2022

AMERICAN COLLEGE of RHEUMATOLOGY
Empowering Rheumatology Professionals

American College of Rheumatology
The Value of Rheumatology
Market Definitions by Quadrant

Quadrant One Metro Areas (High Supply, High Utilization)	Quadrant Two Metro Areas (High Supply, Low Utilization)
Albany-Schenectady-Troy, NY	Akron, OH
Albuquerque, NM	Altoona, PA
Allentown-Bethlehem-Easton, PA-NJ	Anchorage, AK
Amarillo, TX	Appleton, WI
Asheville, NC	Barnstable Town, MA
Athens-Clarke County, GA	Bend-Redmond, OR
Augusta-Richmond County, GA-SC	Binghamton, NY
Baltimore-Columbia-Towson, MD	Bloomsburg-Berwick, PA
Billings, MT	Boulder, CO
Birmingham-Hoover, AL	Bridgeport-Stamford-Norwalk, CT
Bismarck, ND	Burlington-South Burlington, VT
Boston-Cambridge-Newton, MA-NH	Cheyenne, WY
Champaign-Urbana, IL	Columbia, MO
Charleston-North Charleston, SC	Dayton, OH
Charlottesville, VA	Dover, DE
Chattanooga, TN-GA	Duluth, MN-WI
Chicago-Naperville-Elgin, IL-IN-WI	Eau Claire, WI
Cincinnati, OH-KY-IN	Elmira, NY
Cleveland-Elyria, OH	Fargo, ND-MN
Columbia, SC	Fort Wayne, IN
Columbus, OH	Gainesville, FL
Denver-Aurora-Lakewood, CO	Green Bay, WI
Durham-Chapel Hill, NC	Greenville, NC
Harrisburg-Carlisle, PA	Hartford-West Hartford-East Hartford, CT
Houston-The Woodlands-Sugar Land, TX	Huntsville, AL
Indianapolis-Carmel-Anderson, IN	Iowa City, IA
Jackson, MS	Kalamazoo-Portage, MI
Kansas City, MO-KS	La Crosse-Onalaska, WI-MN
Knoxville, TN	Lawrence, KS

Quadrant One Metro Areas (High Supply, High Utilization)	Quadrant Two Metro Areas (High Supply, Low Utilization)
Lexington-Fayette, KY	Manchester-Nashua, NH
Lubbock, TX	Michigan City-La Porte, IN
Madison, WI	Morgantown, WV
Milwaukee-Waukesha-West Allis, WI	Mount Vernon-Anacortes, WA
Minneapolis-St. Paul-Bloomington, MN-WI	Muncie, IN
Nashville-Davidson--Murfreesboro--Franklin, TN	Naples-Immokalee-Marco Island, FL
New Orleans-Metairie, LA	New Bern, NC
New York-Newark-Jersey City, NY-NJ-PA	New Haven-Milford, CT
Oklahoma City, OK	Norwich-New London, CT
Omaha-Council Bluffs, NE-IA	Pensacola-Ferry Pass-Brent, FL
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Pittsfield, MA
Pittsburgh, PA	Portland-South Portland, ME
Portland-Vancouver-Hillsboro, OR-WA	Rapid City, SD
Providence-Warwick, RI-MA	Saginaw, MI
Richmond, VA	San Diego-Carlsbad, CA
Roanoke, VA	San Jose-Sunnyvale-Santa Clara, CA
Rochester, MN	San Luis Obispo-Paso Robles-Arroyo Grande, CA
Rochester, NY	Santa Maria-Santa Barbara, CA
San Antonio-New Braunfels, TX	Seattle-Tacoma-Bellevue, WA
San Francisco-Oakland-Hayward, CA	South Bend-Mishawaka, IN-MI
Savannah, GA	Spokane-Spokane Valley, WA
Shreveport-Bossier City, LA	Springfield, MA
Sioux Falls, SD	St. Cloud, MN
St. Louis, MO-IL	Syracuse, NY
Toledo, OH	Trenton, NJ
Virginia Beach-Norfolk-Newport News, VA-NC	Tucson, AZ

Quadrant Three Metro Areas (Low Supply, Low Utilization)	Quadrant Four Metro Areas (Low Supply, High Utilization)
Alexandria, LA	Abilene, TX
Anniston-Oxford-Jacksonville, AL	Albany, GA
Atlantic City-Hammonton, NJ	Atlanta-Sandy Springs-Roswell, GA
Auburn-Opelika, AL	Austin-Round Rock, TX
Bakersfield, CA	Baton Rouge, LA
Battle Creek, MI	Beaumont-Port Arthur, TX
Bay City, MI	Boise City, ID
Beckley, WV	Bowling Green, KY
Bloomington, IL	Charlotte-Concord-Gastonia, NC-SC
Bloomington, IN	Clarksville, TN-KY
Buffalo-Cheektowaga-Niagara Falls, NY	College Station-Bryan, TX
Canton-Massillon, OH	Columbus, GA-AL
Cape Coral-Fort Myers, FL	Corpus Christi, TX
Cape Girardeau, MO-IL	Dallas-Fort Worth-Arlington, TX
Carbondale-Marion, IL	Davenport-Moline-Rock Island, IA-IL
Cedar Rapids, IA	Des Moines-West Des Moines, IA
Charleston, WV	Detroit-Warren-Dearborn, MI
Chico, CA	Elizabethtown-Fort Knox, KY
Coeur d'Alene, ID	Evansville, IN-KY
Colorado Springs, CO	Fayetteville-Springdale-Rogers, AR-MO
Daphne-Fairhope-Foley, AL	Fort Smith, AR-OK
Decatur, IL	Grand Island, NE
Deltona-Daytona Beach-Ormond Beach, FL	Grand Rapids-Wyoming, MI
El Paso, TX	Greenville-Anderson-Mauldin, SC
Elkhart-Goshen, IN	Gulfport-Biloxi-Pascagoula, MS
Erie, PA	Hattiesburg, MS
Fayetteville, NC	Huntington-Ashland, WV-KY-OH
Flint, MI	Jacksonville, FL
Florence, SC	Jefferson City, MO
Fort Collins, CO	Kingsport-Bristol-Bristol, TN-VA
Fresno, CA	Lafayette, LA
Gainesville, GA	Little Rock-North Little Rock-Conway, AR
Gettysburg, PA	Longview, TX

Quadrant Three Metro Areas (Low Supply, Low Utilization)	Quadrant Four Metro Areas (Low Supply, High Utilization)
Glens Falls, NY	Louisville/Jefferson County, KY-IN
Grand Forks, ND-MN	Louisville/Jefferson County, KY-IN
Great Falls, MT	Lynchburg, VA
Greensboro-High Point, NC	Macon-Bibb County, GA
Hagerstown-Martinsburg, MD-WV	Memphis, TN-MS-AR
Hammond, LA	Miami-Fort Lauderdale-West Palm Beach, FL
Harrisonburg, VA	Montgomery, AL
Hilton Head Island-Bluffton-Beaufort, SC	Ogden-Clearfield, UT
Hot Springs, AR	Orlando-Kissimmee-Sanford, FL
Houma-Thibodaux, LA	Owensboro, KY
Jackson, MI	Peoria, IL
Jackson, TN	Sacramento--Roseville--Arden-Arcade, CA
Jacksonville, NC	Salisbury, MD-DE
Janesville-Beloit, WI	Springfield, MO
Johnson City, TN	St. Joseph, MO-KS
Jonesboro, AR	Tallahassee, FL
Kennewick-Richland, WA	Tampa-St. Petersburg-Clearwater, FL
Killeen-Temple, TX	Terre Haute, IN
Kokomo, IN	Topeka, KS
Lafayette-West Lafayette, IN	Tulsa, OK
Lake Havasu City-Kingman, AZ	Tuscaloosa, AL
Lakeland-Winter Haven, FL	Valdosta, GA
Lancaster, PA	Warner Robins, GA
Lansing-East Lansing, MI	Washington-Arlington-Alexandria, DC-VA-MD-WV
Las Vegas-Henderson-Paradise, NV	Wichita Falls, TX
Lebanon, PA	Wichita, KS
Lincoln, NE	Winston-Salem, NC
Logan, UT-ID	Youngstown-Warren-Boardman, OH-PA
Los Angeles-Long Beach-Anaheim, CA	
Mankato-North Mankato, MN	
Mansfield, OH	
Midland, TX	
Missoula, MT	

Quadrant Three Metro Areas (Low Supply, Low Utilization)	Quadrant Four Metro Areas (Low Supply, High Utilization)
Mobile, AL	
Monroe, LA	
Monroe, MI	
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	
North Port-Sarasota-Bradenton, FL	
Ocala, FL	
Odessa, TX	
Oxnard-Thousand Oaks-Ventura, CA	
Palm Bay-Melbourne-Titusville, FL	
Panama City, FL	
Phoenix-Mesa-Scottsdale, AZ	
Pocatello, ID	
Port St. Lucie, FL	
Pueblo, CO	
Punta Gorda, FL	
Raleigh, NC	
Reading, PA	
Redding, CA	
Reno, NV	
Riverside-San Bernardino-Ontario, CA	
Rockford, IL	
Rome, GA	
Salem, OR	
Salt Lake City, UT	
San Angelo, TX	
Scranton--Wilkes-Barre--Hazleton, PA	
Sebastian-Vero Beach, FL	
Sherman-Denison, TX	
Spartanburg, SC	
Springfield, IL	
St. George, UT	
State College, PA	
Staunton-Waynesboro, VA	

Quadrant Three Metro Areas (Low Supply, Low Utilization)	Quadrant Four Metro Areas (Low Supply, High Utilization)
The Villages, FL	
Victoria, TX	
Vineland-Bridgeton, NJ	
Wilmington, NC	
Winchester, VA-WV	
York-Hanover, PA	