

Measuring Health Plan Relative Resource Utilization

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Executive Summary

Health care costs have continued to escalate at rates that outpace inflation; in 2003 health care expenditures in the United States were nearly \$1.7 trillion, this represents 15.3 percent of the Gross Domestic Product (GDP).¹ In 2004, health care premiums experienced their fourth consecutive year of double-digit growth (11 percent), and they continue to increase much faster than overall inflation (2.3 percent) and wage gains (2.2 percent). Since 2000, health care premiums for family coverage have increased by 59 percent, compared with inflation growth of 9.7 percent and wage growth of 12.3 percent.²

While the upward trend in health care costs continues, employers, consumers and other stakeholders seek improved information on the value of healthcare they purchase. Over the last 15 months, the National Committee for Quality Assurance (NCQA) has engaged in investigations related to the development of economic outcome measures for health plans. The information provided here summarizes these research efforts to measure differences in resource utilization in key clinical areas between health plans. The investigation focused on patients with diabetes, cardiovascular disease, pulmonary and musculoskeletal conditions. Resource utilization was measured along different dimensions, including by condition and by type of service.

NCQA proposed a number of specific objectives to be addressed during the research project:

- Investigate methods for measuring the relative resource consumption for patients with selected conditions.
- Apply alternative methodologies for measuring relative resource consumption – assessing different measurement issues.
- Measure total service and disease-related service costs for patient populations and assessing the merit of these approaches.
- Assess the variation in relative resource consumption findings across different populations, comparing the sensitivity of the results to different measurement approaches.
- Identify denominators (patients) and numerators (cost and utilization measures) for each condition. Assess using both diagnosis and procedure codes to accurately and completely identify populations.
- Apply risk adjustment within clinical conditions for each population.
- Identify resource consumption categories that can be reliably and consistently captured. (For example, evaluation & management visits, procedures, diagnostics etc.)
- Identify resource consumption categories that can be used as a proxy for total resource consumption.
- Investigate the impact of distinguishing between disease-related and non-disease related (or total) resource consumption. Determine if resource consumption scores restricted to disease-related costs only compare to scores based on total services.
- Test the impact of morbidity adjustment using age and gender case-mix adjustment—the Morbidity and Age-Sex Adjusted approach (a study defined methodology using initial clinical categorization of patients with specific morbidity and age-sex classifications within those clinical categories), as well as a more widely available population morbidity adjustment method on performance results, Episode Risk Groups (ERGs – a proprietary population-based health risk assessment technology distributed by Symmetry Health Data Systems, Inc.)

- Test the impact of assigning services to disease-related episode of care approach (a more widely available approach) to assigning disease-related services. Compare results from Episode Treatment Groups (ETGs – a proprietary episode of care grouping methodology distributed by Symmetry Health Data Systems, Inc.) to an alternative using the same logic as used to identify patients for the study, Disease Identification (DID – a study-defined methodology that employs the primary diagnosis codes for a service to identify disease-treated).
- Determine the performance range on resource consumption scores between targeted chronic conditions, health plans and insurance product types.

Study measures included the cost, overall and by type of service, for patients with the selected clinically and financially important conditions. Relative resource utilization was measured for study patients, overall, and for those services directly related to the treatment of the study condition. All study measures were risk-adjusted to support valid comparisons across conditions and health plans.

The study produced a number of key findings related to resource measurement at the health plan level:

- Health plans can be meaningfully measured and compared with respect to the relative resource consumption of their networks for select resource categories.
- Methodologically defensible non-proprietary methods can be identified for severity and case adjustment.
- Standard pricing methods can be employed that removed unit price variation as a factor in resource measurement. A significant obstacle in sharing cost information at the health plan level is the proprietary nature of the fee schedules and contracts that describe their pricing of services.
- Relative resource consumption seems to vary meaningfully between health plans. More specific findings related to these measures provided insights related to the services, conditions and methods used for study.
- The study explored the potential for the use of a subset of services as a proxy for measuring resource use for all services. In this way, services that can be reliably measured could be the focus of initial measurement and also present a reasonable burden on health plans in collecting this information. The study found measures of relative resource utilization were generally similar using “selected” services (inpatient, pharmacy, evaluation and management, and procedures, including Ambulatory Surgery Centers (ASC) costs) versus measurement using all services.
- The relationship between population size and variation in measures of relative resource utilization – i.e., what is a sufficient sample size to produce consistently valid numerators and denominators and how large of a health plan is required to achieve these thresholds -- was explored. Typical standard errors were measured for each condition – demonstrating the relationship between population size and likely precision of measures of relative resource use. A typical standard error for measuring total service relative resource utilization was observed to be approximately 0.025 at samples of 2,000 patients or more. In general, the standard errors were relatively higher for measures of disease-related services versus total services

To further these findings and their utility NCQA plans to continue research in this area and engage in discussions with health care industry consultants, actuaries and other experts to assist in this process. In addition, NCQA is interested in refining the methods developed during this study and finalizing measure specifications for health plan or large health care organization comment and implementation. The feasibility, including health plan burden for collecting and programming measures, needs to be further explored by engaging health plans in a field test study. The field test would also inform an understanding of the metrics comparability, and regional differences which are not sufficiently explored here. NCQA also plans to relate the relative resource utilization measures with quality outcomes, which is an important step to fully understanding health care services efficiencies. This study only looked at selected chronic conditions and it is unknown how the study developed method could be applied to acute events or illnesses. In addition, provider level resource consumption was not explored and it is likely that a more robust risk-adjustment method than the study-developed Age-Sex Morbidity, as well as patient or illness attribution, would need to be applied.

I. Background & Research Development

A. Background

Health care costs continue to escalate at rates that outpace inflation; in 2003 health care expenditures in the United States were nearly \$1.7 trillion, this represents 15.3 percent of the Gross Domestic Product (GDP).³ In 2004, health care premiums experienced their fourth consecutive year of double-digit growth (11 percent), and they continue to increase much faster than overall inflation (2.3 percent) and wage gains (2.2 percent). Since 2000, health care premiums for family coverage have increased by 59 percent, compared with inflation growth of 9.7 percent and wage growth of 12.3 percent.⁴ According to the Center for Medicare and Medicaid Service Office of the Actuary, by 2010 we can expect health care expenditures to represent approximately 17 percent of GDP.⁵

How to contain health care costs is one of the most challenging policy issues facing the United States. Health plans and purchasers are interested in standard measures of relative resource utilization because of their potential to be used as a tool to reduce costs. Health system efficiencies are often defined as attainment compared to the maximum that could be achieved for the observed level of resource use.⁶ Research by Wennberg, Fisher and others shows that the problem of variation in intensity of treatment for chronic illness is primarily a problem of overuse and waste, not underuse and health care rationing (i.e., poor quality). In several studies of Medicare data, Wennberg and Fisher found that Medicare spending can vary by more than twofold in different regions of the United States even after adjusting for differences in health of the population.⁷ In exploring if these differences in Medicare spending led to different outcomes, or health, they found no evidence that the regions of higher spending had any survival advantage.⁸ Differences in resource utilization with no net positive health outcomes represent waste in the health care delivery system.

Methodological solutions are emerging to measure such differences in a reliable and valid fashion. The science of measuring health plan quality has advanced considerably in recent years, and there is good understanding within the industry on how to measure health care quality at various levels (outputs), especially at the health plan and hospital levels. On the other hand, efforts to measure relative resource utilization (input costs) in a standardized method are only just emerging.

NCQA has over the last 15 months engaged in targeted activities to identify opportunities to develop economic outcome measures for health plans. The information provided here summarizes these research efforts to measure differences in resource consumption in key clinical areas between health plans. The development of these metrics is essential to better able relate input costs to output for health care services.

B. Development and Field Study

As part of the investigation, NCQA convened a panel of experts, the Efficiency Measurement Advisory Panel (EMAP), to discuss different methodological issues related to relative resource use measurement and develop an approach to reliably and validly measure relative resource use. Using a large managed care database and with the assistance of Integrated Healthcare Information Services, Inc (IHCIS), NCQA performed research focusing on different methodological issues proposed by the EMAP. This document presents the findings of the field test research study.

The approach to measurement used for the investigation focused on creating and testing a meaningful and “manageable” approach. In particular:

- Select relevant clinical conditions for study – conditions that are both financially and clinically important, but also conditions that can support generalization to a broader group of diseases. These conditions were further selected because relevant quality metrics are currently available for the same conditions allowing for subsequent linking of quality and resource use for the same conditions.
- Employ measures of resource utilization that can be obtained in a reliable and practical way – using methods that can be replicated across health plans and also present a reasonable burden in measurement.
- Explore those components of resource costs that can be measured reliably – if a subset of services can be found that can be measured reliably, that subset can serve as a good proxy for all services.

C. Research Objectives and Questions

NCQA proposed a number of specific objectives to be addressed during the research project:

- Investigate methods for measuring the relative resource consumption for patients with selected conditions.
- Apply alternative methodologies for measuring relative resource consumption – assessing different measurement issues.
- Measure total service and disease-related service costs for patient populations and assessing the merit of these approaches.
- Assess the variation in relative resource consumption findings across different populations, comparing the sensitivity of the results to different measurement approaches.
- Identify denominators (patients) and numerators (cost and utilization measures) for each condition. Assess using both diagnosis and procedure codes to accurately and completely identify populations.
- Apply risk adjustment within clinical conditions for each population.
- Identify resource consumption categories that can be reliably and consistently captured. (For example, evaluation & management visits, procedures, diagnostics etc.)
- Identify resource consumption categories that can be used as a proxy for total resource consumption.
- Investigate the impact of distinguishing between disease-related and non-disease related (or total) resource consumption. Determine if resource consumption scores restricted to disease-related costs only compare to scores based on total services.

- Test the impact of morbidity adjustment using age and gender case-mix adjustment—the Morbidity and Age-Sex Adjusted approach (a study defined methodology using initial clinical categorization of patients with specific morbidity and age-sex classifications within those clinical categories), as well as a more widely available population morbidity adjustment method on performance results, Episode Risk Groups (ERGs – a proprietary population-based health risk assessment technology distributed by Symmetry Health Data Systems, Inc.)
- Test the impact of assigning services to disease-related episode of care approach (a more widely available approach) to assigning disease-related services. Compare results from Episode Treatment Groups (ETGs – a proprietary episode of care grouping methodology distributed by Symmetry Health Data Systems, Inc.) to an alternative using the same logic as used to identify patients for the study, Disease Identification (DID – a study-defined methodology that employs the primary diagnosis codes for a service to identify disease-treated).
- Determine the performance range on resource consumption scores between targeted chronic conditions, health plans and insurance product types.

II. Methods

A. Data Source

The IHCIS Managed Care Benchmark Database served as the source of data for the analysis. The Benchmark Database includes medical and pharmacy claims and enrollment for more than 25 million unique individuals, 30 health plans and other contributors. The database population was comprised of primarily non-elderly, commercially enrolled individuals. All data were standardized and evaluated for completeness and consistency. Costs were based on a standard pricing methodology applied across all contributors and time periods (using Relative Value Units (RVUs) and other methodologies).

For the analysis described here, a subset of the Benchmark Database population was selected. In particular, the study population met the following criteria:

- at least 6 months of enrollment in the year (2003) used to identify patients and measure costs and utilization.
- selected from a number of different populations (health plans) that met sufficient product and geographic variation (given available data).

In the end 1 Medicare Risk, 1 Medicaid and 12 commercial populations were selected for the study meeting the above selection criteria. The total population meeting the above criteria exceeded 7.5 million individuals. The population included a mix of HMO, PPO and POS products and included Blue Cross Blue Shield and regional plans of different sizes from across the U.S. The population was disproportionately from the northeast, with only limited enrollment from the Pacific region.

B. Patient Disease Identification Criteria

Chronic conditions known to have both clinical importance and also have high health plan costs and utilization rates were selected for this research project. In 2004, a study by Thorpe, Florence and Joski found that five health conditions accounted for roughly one-third of the increase in health care costs between 1987 and 2000.⁹ These conditions included heart disease, mental health disorders, pulmonary conditions, cancer and trauma. The major chronic conditions selected for this study initially covered three of these conditions: cardiovascular disease, asthma and chronic obstructive pulmonary disease COPD, and depression and excluded patients with one of these conditions: cancer. In the end, the conditions selected for this study were: cardiovascular disease, diabetes, asthma/COPD, arthritis and low back pain. While depression was initially included as part of the study due to concerns related to the collection of complete and consistent mental health claims information from health plans (due to carve outs and benefit differences), and based on EMAP input, depression was subsequently dropped as a major clinical category for the study. Within these major clinical groupings sub-categories of conditions were also identified.

In the end, patients with one or more of the following clinical groupings were selected for study:

- Cardiovascular
 - AMI
 - Angina
 - CAD
 - CHF
- Diabetes
 - Diabetes Type I
 - Diabetes Type II
- Asthma/COPD
 - Asthma
 - COPD
- Arthritis/Low Back Pain
 - Arthritis
 - Low Back Pain (LBP)

In order to identify patients within these categories, HEDIS[®]-based algorithms were identified. The general approaches used to identify patients for a condition were as follows:

- 12-month period of data available.
- Patients selected for a condition who had at least:
 - one inpatient admission or
 - one ER visit or
 - two or more ambulatory evaluation and management (E&M) services during that period of time with a diagnosis code that met the criteria for a study condition categories (first 3 diagnosis positions searched).
- For condition categories that can be identified by a CPT procedure code (CAD, CABGs and PTCAs), then a patient with one or more services with those procedure codes was used.
- For condition categories that can be identified by a National Drug Code (NDC) (i.e., asthma, diabetes), then members could be identified based on two or more prescriptions on separate days that match one or more of the NDC codes specified.

Clinical Grouping Hierarchies

Members could be identified for more than one of the four major clinical groupings in the study (cardiovascular, asthma/COPD, diabetes, arthritis/LBP). However, within a major clinical group hierarchies were imposed so that a patient was identified only once within that major grouping (see Table A). Thus, within cardiovascular disease, a patient was assigned to one condition using the following hierarchy: CHF, AMI, CAD, or Angina. Within asthma/COPD, a member was assigned to one condition using a hierarchy of COPD and then asthma. Within diabetes, a member was assigned to one condition using a hierarchy of Type I diabetes and then Type II diabetes. Within arthritis/LBP, a member was assigned to one condition using a hierarchy of arthritis and then LBP.

Co-Morbid Identification

The primary clinical groupings, with the exception of arthritis and LBP, were further stratified using the presence of a relevant co-morbid condition. For this analysis, co-morbid conditions included: cardiovascular disease, diabetes, depression, hypertension, COPD/asthma, and chronic renal failure (CRF) (for diabetes only). Hypertension and CRF were not initially included as co-

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morbid conditions in but were added during the research study based on clinical expert input following review of proposed methods.

Based on the four major clinical categories, the ten sub-clinical categories, and the co-morbidities, the following 18 patient populations were identified. As stated previously, patients could be identified for more than one of the four major clinical groupings. However, within a major clinical group (i.e., cardiovascular, asthma/COPD, diabetes, and arthritis/LBP) a member was assigned to only one sub-clinical condition using the hierarchy described above. All study analyses were performed at the 18 detailed clinical categories and then aggregated to higher levels using appropriate methods.¹

Table A: Clinical Hierarchies and Co-Morbid Groups

Major Clinical Category	Clinical Sub-Category	Co-Morbidity Group
Cardiovascular	CHF	CHF
Cardiovascular	CHF	CHF, with Co-morbidity
Cardiovascular	AMI	AMI
Cardiovascular	AMI	AMI, with Co-Morbidity
Cardiovascular	CAD	CAD
Cardiovascular	CAD	CAD, with Co-Morbidity
Cardiovascular	Angina	Angina
Cardiovascular	Angina	Angina, with Co-Morbidity
Diabetes	Diabetes, Type I	Diabetes, Type I
Diabetes	Diabetes, Type I	Diabetes, Type I, with Co-Morbidity
Diabetes	Diabetes, Type II	Diabetes, Type II
Diabetes	Diabetes, Type II	Diabetes, Type II, with Co-Morbidity
Asthma/COPD	COPD	COPD
Asthma/COPD	COPD	COPD, with Co-Morbidity
Asthma/COPD	Asthma	Asthma
Asthma/COPD	Asthma	Asthma, with Co-Morbidity
Arthritis/LBP	Arthritis	Arthritis
Arthritis/LBP	LBP	LBP

Patient Exclusions

Members with evidence of other dominant medical conditions, such as active cancer, organ transplants, end stage renal disease (ESRD) or HIV/AIDS, were excluded from the analysis. Patient age criteria were also used to exclude individuals, specifically: patients less than 5 years of age were excluded from asthma/COPD; patients less than 18 years of age were excluded from diabetes, LBP, and arthritis; and patients less than 35 years of age were excluded from all cardiovascular conditions.

¹ Note that the clinical categorization provides the first step in risk adjustment for the study and is built into all analyses – whether or not any further methodological approaches/adjustments are applied. All other methods, including ERGs and ETGs build from this structure.

C. Cost and Utilization Experience

Cost and utilization experience were measured for the same 12 months used to identify patients. All inpatient facility, outpatient facility, professional, ancillary and pharmacy claims for the disease-identified members were selected. Measures of cost and utilization were produced for all services and some selected service categories that may serve as a proxy for all services. The selected service categories included inpatient facility, pharmacy, evaluation and management (including consults), and procedures (including outpatient facility and ambulatory surgical center services.) These categories were identified by NCQA and the EMAP as potential services that can be reliably and consistently captured based on initial analyses. The following service categories were used to measure costs and utilization:

- Ambulatory surgery – services provided by outpatient facilities for procedures.
- Consultations – patient consultations in the office and other settings.
- Diagnostic – diagnostic services, other than lab and radiology, provided by professional and facility providers.
- Evaluation and management (E&M) – evaluation and management services other than consultations and emergency room visits (primarily office and inpatient physician visits)
- Emergency room (ER) – emergency room services provided by professional and facility providers.
- Inpatient facility – inpatient services provided by facilities.
- Laboratory – lab services provided by professional and facility providers.
- Physical medicine – physical therapy and other physical medicine services provided by professional and facility providers.
- Procedures – surgical procedures provided by professional providers
- Pharmacy – prescription drug services.
- Radiology – radiology services provided by professional and facility providers.
- Other – all other services not identified above.

The cost measure used in the analysis was based on a standard costing methodology and priced at calendar year (CY) 2003 levels. Early on in the process it was determined that collecting true unit price would not be possible due to the proprietary nature of prices and discounts negotiated between health plans and providers. In this study, pricing levels reflect total allowed payments, inclusive of health plan liability and patient cost-sharing. Costs were reported by a cost per patient per month (PMPM) measure. Since a standard costing methodology was employed for the study data, the costs reported can be considered “weighted utilization,” i.e., they were computed using service counts and RVUs per service and a dollar factor to convert RVUs to dollars. These RVUs represent units of standard priced dollars, in relative terms.

Disease-Related Costs and Utilization

Two different approaches were used to identify disease-related costs. The first approach employed a widely-used tool, ETGs, which uses an episode of care approach to assign medical and pharmacy services to conditions and diseases. More specifically, ETGs use a basic illness classification methodology that combines related services into a medically relevant unit describing a complete episode of care. Episodes are created based on a series of rules and the diagnoses and procedures found on medical claims, including drug treatments listed on

pharmacy claims. Examples of ETGs are: insulin-dependent diabetes, with co-morbidity; coronary disease, with AMI, with coronary artery bypass graft; and asthma, without co-morbidity, age less than 18. For this field study the ETG grouper software was applied to 12-months of medical and pharmacy claims used for each patient. The result was an output file that includes the ETG assigned to each service, along with other information, which were then mapped to each of the major clinical groupings.

Where patients were identified for a clinical grouping within a larger major clinical category (e.g., cardiovascular or asthma/COPD), all of the disease-related costs within that category were assigned as disease-related for that clinical grouping for that patient. For example, for a member assigned ultimately to a CHF clinical category, any disease-related costs for all ETGs assigned to CAD, angina, and AMI were also included. The same approach was used for asthma/COPD, where a patient identified ultimately as a COPD patient received the disease-related costs for both asthma and COPD. Since ETGs assign each service uniquely to a single episode of care, services could not be disease-related to multiple major clinical categories. For example, an inpatient stay could not be assigned as disease-related to both CHF and type I diabetes.

The second approach to assigning disease-related costs employed the same diagnosis and procedure-based methodology as was used to identify patients for the study. This approach was called the Disease Identification (DID) approach. A medical service was determined to be disease-related if any of the diagnosis (using the first 3 diagnostic positions) or procedure codes on the service corresponded to one or more of the diagnosis or procedure codes used to identify the clinical categories. Disease-related pharmacy services were identified based on the NDC code on the pharmacy claim and were mapped to the highest-level therapeutic categorization developed for each major clinical category. For example, Cardiovascular System Agents, Blood Agents, Agents that Affect Blood Lipids/Sugar/Amino Acids, and Drugs Given To Alter Blood Coagulation were included as disease-related to cardiovascular conditions. Since a single service could have multiple diagnosis codes (some of which could be assigned to a different clinical category), using the DID approach allows a service to be used as disease-related for multiple conditions. For example, an inpatient stay with diagnoses listed for both CHF and diabetes type I would be assigned as disease-related for both conditions.

Further in the research study, hypertension episode of care services were included as co-morbid clinical category in disease-related costs for the cardiovascular clinical category.

Total Costs and Utilization: Morbidity Adjustment

The disease-related methodologies were used to assign services and costs to each clinical category. An important objective of the study was also to measure total service costs for patients in each clinical category, including those related to the disease and other services. This measurement required a population-based risk assessment approach that could capture the overall patient morbidity, including conditions related to the clinical category being studied as well as all conditions observed for the patient.

Morbidity categories include groups of patients with similar levels of health risk. Two different approaches were used to assign patients to morbidity categories for the analysis. The first method employed a widely used diagnosis-based tool, Episode Risk Groups (ERGs). ERGs are an episode-based approach to health risk assessment and compute an overall level of risk for an

individual based on their observed mix of episodes of care. A patient's relative risk score is a number such as 0.50, 1.00, or 1.50. A risk score of 0.50 indicates a health risk approximately half of that of the average member in an index population, a score of 1.00 means the patient's relative risk is equal to the average member, and 1.50 indicates a fifty percent greater risk. The index population for ERGs is a large, non-elderly managed care population. Retrospective (concurrent) values of health risk were used for the analysis. Eight ERG morbidity categories were created for use in the study:

- | | |
|--------------------------------------|--|
| 1. risk score less than 1.00 | 5. risk score 8.00 to less than 12.00 |
| 2. risk score 1.00 to less than 2.00 | 6. risk score 12.00 to less than 15.00 |
| 3. risk score 2.00 to less than 4.00 | 7. risk score 15.00 to less than 20.00 |
| 4. risk score 4.00 to less than 8.00 | 8. risk score 20.00 or higher |

Using their risk score a patient was assigned to the appropriate ERG morbidity category. The ranges used for these categories were based on the observed distribution of risk for study patients and the desire to create a limited number of categories to support sufficient sample size within each grouping and also to limit reporting burden.

The second approach to morbidity adjustment for measuring the relative resource utilization for total service employed an age-sex model. Based on an analysis of the distribution of study patients and their costs, the following age-sex categories were employed, where "All" indicates both genders for the same age range:

- | | |
|------------------------|--------------------|
| • All, 00-17 years | • All, 55-64 years |
| • Females, 18-44 years | • All, 65-74 years |
| • Males, 18-44 years | • All, 75+ years |
| • All, 45-54 years | |

In summary, ERGs and the age-sex model were used as the basis for creating morbidity categories to support total service measurement. Further, given the stratification of patients into the 18 clinical categories previously described, the final population-based risk assessment methodology was:

- ERG-based Morbidity Adjustment – using ERGs within clinical categories, including with and without co-morbidity.
- "Age-Sex" and Clinical Category-based Morbidity Adjustment – using age-sex groupings, within clinical categories, including with and without co-morbidity. (The study controlled for a clinical condition, such as CHF, with co-morbidity, and then applied age-sex morbidity adjustment within that condition.)

D. Measures of Relative Resource Utilization

Relative resource utilization was measured along a number of dimensions, including clinical categories, service categories, and populations. Relative resource utilization is defined as the observed costs or utilization for a service category (or total services) divided by the "peers" amount. Peers experience is the expected resource consumption if the peers had a similar mix of patients to that observed for the population. In other words, for this study, the peers amount is the risk adjusted value for that service category, after accounting for the patient's clinical

category (including co-morbidity) and morbidity category (based on ERGs or age-sex). For this study, *peers* was based on the total population of patients used for the study. Alternatively, peers could be based on an external population or benchmark, using different assumptions.

Services were also assigned to disease-related, or not disease-related categories using the ETG and the DID methodology. Patients were assigned to an ERG and an Age-Sex morbidity category.

For example, for disease-related cost ETG approach, a patient's costs determined to be CHF-related were summarized by service category and overall, which is the observed CHF-related experience for that patient. Peer values for CHF-related costs for that patient were determined by averaging CHF-related costs, by service category, for all patients assigned to the CHF with co-morbidity clinical category. The resource consumption index for that patient for disease-related CHF is their observed costs divided by peer amounts. The observed and peers disease-related costs using the DID approach were computed separately, using a similar methodology.

For total-service cost ERG approach, the patient's overall costs, i.e., CHF-related and other, were summarized by service category and overall, which is the observed costs for total services for that patient. Peer values for total service costs for that patient were determined by averaging the total service costs, by service category, for all patients assigned to the CHF with co-morbidity clinical category. The resource consumption index for that patient for total service costs for CHF is their observed costs divided by peer amounts. The observed and peers total service costs using the Age-Sex morbidity approach were computed separately, using a similar methodology.

The observed and peers amounts created in this way can then be aggregated across patients to produce findings at different levels (e.g., population and sub-clinical category or population and major clinical category). Further, these amounts and the resource index can be computed using four different approaches:

- Total services, ERG Morbidity Approach
- Total services, Age-Sex Morbidity Approach
- Disease-related services, ETG Approach
- Disease-related services, DID Approach

III. Results

A. The Relative Resource Utilization Index

The research focused on patients identified with one or more of the following major clinical groupings:

- Cardiovascular disease
- Diabetes
- Asthma/COPD
- Arthritis/LBP

Methods were developed to identify denominators (patients) and numerators (cost and utilization measures) for each condition. Risk adjustment within clinical conditions for each population was performed using different approaches. Cost and utilization was measured by type of service and for both total services and disease-related services.

Results and general conclusions in this part of the research are presented in Tables 1 – 10.

Table 1: Description of Enrolled Populations used for Selecting Study Populations (General description of population size, the percentage of members less than 35 and over 64, the percent female, and pharmacy benefit status.

Question/Issue Addressed -- What are the general characteristics of the study populations?

High-Level Interpretation

- The populations describe enrolled populations of different size, including some larger groups of enrollees.
- As expected, the Medicare and Medicaid populations include primarily elderly and younger individuals, respectively.
- The commercial populations (populations A-S), were mostly similar in terms of age and gender mix.
- There was some variation in the percentage of each population with a pharmacy benefit (63 to 100 percent) suggesting pharmacy data was available for that component of the population for the study.

Table 2: Percent Prevalence of Patients, by Population and Clinical Grouping (Describes the prevalence of each clinical category (before co-morbidity split).) The table includes the percentage of the enrolled population identified with a condition. As noted before, members can be identified for multiple major clinical categories, but with some major categories, hierarchies were applied to assign the patient to a single category within that group (e.g., cardiovascular).

Question/Issue Addressed -- What is the prevalence of each condition? How does it vary across populations? What will be the typical sample of patients for a health plan of a certain size for a particular condition?

High-Level Interpretation

- For the commercial population, the prevalence of patients by clinical condition was similar, in general, across the individual populations.
- The magnitudes of prevalence were consistent, in general with expectations, given the study identification methods and a typical elderly, Medicaid, and commercial population.
- For the commercial population, the most prevalent conditions were asthma, depression and LBP; the least prevalent were AMI, angina, and CHF.
- For the Medicare population, the most prevalent conditions were arthritis, CAD and diabetes (combined); the least prevalent were asthma and angina.
- For the Medicaid population, the most prevalent condition was asthma; the least prevalent were the cardiovascular conditions.

Table 3: Percent Prevalence of Patients Identified with One or More Study Co-Morbidities (Describes the prevalence of co-morbidities within each clinical category. The table includes the percentage of the patients for a clinical category that were also identified as having a qualified co-morbidity (cardiovascular, diabetes, asthma/COPD, and depression.))

Question/Issue Addressed -- What is the prevalence of co-morbidities for each condition? How does it vary across populations? What will be the typical sample of patients for a health plan of a certain size for a particular condition, by co-morbidity?

High-Level Interpretation

- For the Medicare population, co-morbidity prevalence was somewhat higher than that for the other populations – reflecting the relatively high likelihood of multiple chronic and other conditions for an elderly patient with one or more of the study conditions.
- For the Medicaid population, co-morbidity prevalence varies and was highest for the cardiovascular conditions.
- For the commercial populations, although some modest differences were observed, co-morbidity prevalence, by condition was similar across populations. In general, diabetes and cardiovascular conditions have the higher co-morbidity prevalence, while depression and asthma were lowest.
- No co-morbid conditions were identified for arthritis and LBP.

NOTE: All the remaining tables are for the commercial populations only.

Table 4: Total Costs PMPM, by Population and Clinical Groupings, Commercial Population (Describes the total costs for all services, by sub-clinical grouping and population. The table includes costs PMPM for patients in each grouping.)

Question/Issue Addressed -- What is the typical total expenditures for patients with different conditions? Do patients with the same condition and co-morbidity have different costs? How do the estimates vary across populations?

High-Level Interpretation

- Patient costs were highest for AMI and CHF and lowest, on average, for asthma patients.
- As expected, costs for members with a condition and a qualified co-morbidity were higher than for patients with the same condition without co-morbidity.

- In general (with a few exceptions), the average costs for a clinical grouping were similar across plans.

Table 5: Cost PMPM, by Clinical Grouping and Service Category, Commercial Population

(Describes costs for all services, by detailed clinical grouping and service category. The table includes service category costs PMPM for patients in each grouping. The bottom portion of the tables presents service category costs as a percentage of total costs for each clinical category.)

Question/Issue Addressed -- What is the typical total expenditures for patients with different conditions, by service category? What is the most important service category financially? How do the estimates vary across clinical categories?

High-Level Interpretation

- As expected, variation in patient costs across clinical categories was observed. Further, differences in the relative importance of categories by clinical grouping were also evident.
- Inpatient and pharmacy services comprise the largest individual service category percentages. Inpatient services were most important for cardiovascular conditions.
- The “Other” category (denoting services that may be more difficult to quantify and measure) comprises 10-15 percent of total service costs – a consistent percentage across clinical groupings.

Table 6: Total Disease Related Costs PMPM, by Population and Service Category, Using ETG Methodology, Commercial Population (Focuses on disease-related costs. Estimates were provided by clinical grouping and service category for the ETG methodology of disease-related costs. These analyses were also conducted using the study-developed DID methodology.)

Question/Issue Addressed -- What is the magnitude of disease-related costs for each clinical grouping? How do these amounts vary by service category?

High-Level Interpretation

- Disease-related costs represent a significant portion of total service costs for some conditions – in particular the cardiovascular conditions (approx 50-80 percent). These percentages vary by service category.
- Disease-related costs represent a lesser portion of total service costs for some conditions, e.g., asthma, COPD, arthritis and LBP.
- For many conditions, the magnitude of the disease-related costs was comparable whether using the ETG or DID approach – the exceptions were asthma, COPD and diabetes, with co-morbidity, where the DID amounts were higher (for total services and other service categories). In general, findings were comparable between the two approaches.

Table 7: Resource Consumption Index, Total Patient Costs, by Population and Services Category, Cardiovascular Clinical Groupings ERGs used for Risk Adjustment (Describes the resource utilization index findings for cardiovascular conditions and presents the total service results (disease plus non-disease related costs) using ERG morbidity adjustment.)

Table 8: Resource Consumption Index, Disease-Related Patient Costs, by Population and Service Category, Cardiovascular Clinical Groupings ETGs used for Assignment of Disease Related Costs (Presents disease-related results using the ETG disease-related approach.)

The results for the cardiovascular conditions represent the aggregate findings across AMI, CHF, angina and CAD at the population level.

Question/Issue Addressed-- Tables 7 and 8 and their charts focus on the variation in relative resource utilization across service categories and populations for a clinical grouping. The importance of each service category to total costs for cardiovascular conditions is shown at the bottom of each table (as a percentage of total costs, excluding other). The questions/issues addressed by these tables relate to the correspondence of findings across measurement methods and clinical categories and the variation in resource utilization across the studied plans.

Table 9: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Measurement Approach, Across Major Clinical Categories (Compares the relative resource consumption index findings across different methods, by major clinical category and population. The index is the ratio of actual to peers experience, adjusted for risk.)

Table 10: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Major Clinical Categories, Including ALL Study Conditions and Diseases (This table compares the relative resource consumption index findings across different methods, by major clinical category and population. The index is the ratio of actual to peers experience, adjusted for risk.)

Question/Issue Addressed-- Tables 9 and 10 describe the resource utilization index findings for all major clinical categories and for all study conditions combined. Both tables include the results for total costs both for total services or total disease-related services. Table 9 compares the findings for a given measurement approach across clinical categories. Table 10 compares the findings for a given clinical category, across the four measurement approaches. The charts at the bottom of the tables present the key findings graphically.

The following four measurement approaches were compared for each major clinical category:

- Total services, ERG Morbidity Approach
- Total services, Age-Sex Morbidity Approach
- Disease-related services, ETG Approach
- Disease-related services, DID Approach

High Level Interpretation of Tables 7 through 10

- Findings on Relative Resource Utilization – Variation by Type of Service (**Table 7**):
 - For a given health plan and clinical category, measures of relative resource utilization were generally similar across different types of service, with only some modest variations. The consistency was greatest for those services comprising a larger portion of overall costs measured (e.g., inpatient and pharmacy).
 - In addition to showing the variation in findings across type of service categories, Table 7 also shows the correspondence of findings when using all types of services or the subset of services (rightmost columns of the table). For a given health plan and clinical category, measures of relative resource utilization were generally similar using the “selected” group of services (inpatient, pharmacy, E&M and procedures) versus all types of service. In general, where differences were observed, relative resource utilization for diagnostic services (radiology, laboratory, and other diagnostic testing) were the primary factor.

- Findings on Relative Resource Utilization – Variation Across Clinical Category (**Table 9**)
 - For a given population, measures of relative resource utilization were generally similar across the major clinical categories, i.e., similar findings were observed for the same population for cardiovascular disease, diabetes, depression, asthma/COPD, and arthritis/LBP. This was particularly true for total service costs. For disease-related costs somewhat greater variation was observed across conditions for the same population.
- Findings on Relative Resource Utilization – Variation Across the Four Methods (**Table 10**)
 - For a given population and clinical category, measures of resource utilization were generally similar across the four different approaches to measurement described above, with only some modest variations.

B. Refining the Metrics and Findings

Following review of the research findings discussed above NCQA and the EMAP identified additional analyses necessary to further this study findings. Some of these analyses addressed refinements to the study methodologies, while others focused on different approaches to summarize key findings and results. The primary component during the later part of the work was to update the analyses using changes to the underlying methodologies and explore related issues summarizing the findings.

In addition to refining these methods, the following was also addressed:

- Identify potential service categories that were straightforward to measure and were reasonable proxies for total resource measurement. These categories included:
 - Inpatient utilization
 - Pharmacy Services
 - Evaluation and Management
 - Procedures, including Outpatient Facility and ASC costs.
- Summarize the relationship between population size and variation in measures of relative resource utilization – i.e., determine sufficient sample size to produce consistently valid numerators and denominators and how large of a health plan is required to achieve these thresholds. Provide information to determine expected confidence intervals for key study measures.

Figure 1a: Standard Error of Relative Resource Utilization, by Condition Member Sample Size-- Total Services, ERG Adjustment (This figure describes the effect of sample size within a major clinical category and the relative resource utilization measurement when using the ERG adjustment method.)

Figure 1b: Standard Error of Relative Resource Utilization, by Condition Member Sample Size-- Total Services, Age-Sex Adjustment (This figure describes the affect of sample size within a major clinical category and the relative resource utilization measurement when using the study developed Age-Sex adjustment method.)

Figure 1c: Standard Error of Relative Resource Utilization, by Condition Member Sample Size—Disease-Related Services, ETG Adjustment (This figure describes the affect of sample

size within a major clinical category and the relative resource utilization measurement when using the ETG adjustment method.)

Figure 1d: Standard Error of Relative Resource Utilization, by Condition Member Sample Size—Disease-Related Services, DID Adjustment (This figure describes the affect of sample size within a major clinical category and the relative resource utilization measurement when using the study developed DID method.)

Summary Questions/Issues Addressed -- What is the relationship between population size and variation in measures of relative resource utilization – i.e., what is a sufficient sample size to produce consistently valid numerators and denominators and how large of a health plan is required to achieve these thresholds? What is the expected confidence interval around a measure for a health plan of typical size and disease characteristics? Does the relationship between sample size and variation differ by disease or methodology used?

Figures 1a-1d Summary Interpretation

- A typical standard error for measuring total service relative resource utilization was observed to be approximately 0.025 at samples of 2,000 patients or more. For example, for a condition with a typical prevalence of 1 percent of enrolled members, a health plan of 250,000 members would yield a patient sample of 2,500. Based on the above standard error, the expected 95 percent confidence interval around the estimated resource utilization index would be approximately +/- 0.05, where 0.05 equals twice 0.025 (a 95 percent confidence interval is approximately 2 standard errors).
- In general, the standard errors were relatively higher for measures of disease-related services versus total services.

IV. Summary and Conclusions

The investigations described in this report can provide insights into the conceptual and methodological issues in measuring relative utilization at a health plan level. Using a large research database and the methods described above, the study addressed a number of questions related to assessing resource utilization at the health plan and population levels. Study measures included the cost, overall and by type of service, for patients with selected clinically and financially important conditions. Relative resource utilization was measured for study patients, overall, and for those services directly related to the treatment of the study condition. All study measures were risk-adjusted to support valid comparisons across conditions and health plans.

The study produced a number of key findings related to resource measurement:

- Health plans can be meaningfully measured and compared with respect to the relative resource consumption of their networks for select resource categories.
- Methodologically defensible non-proprietary methods can be identified for severity and case adjustment. These methods can serve as the basis for the development of practical algorithms to support measurement of resource utilization at the health plan level – involving a reasonable burden on health plans in measurement and also avoiding the need for requiring their use of a proprietary tool.
- A significant obstacle in sharing cost information at the health plan level is the proprietary nature of the fee schedules and contracts that describe their pricing of services. This study employed standard pricing methods that removed unit price variation as a factor in resource measurement.
- Relative resource consumption seems to vary meaningfully between health plans. More specific findings related to these measures provided insights related to the services, conditions and methods used for study:
 - Services – for a given health plan and clinical category, measures of relative resource utilization were generally similar across different types of service, with only some modest variations. The consistency was greatest for those services comprising a larger portion of overall costs measured (e.g., inpatient and pharmacy).
 - Study Conditions – for a given health plan, measures of relative resource utilization were generally similar across the study conditions – i.e., similar findings were observed for the same population for cardiovascular disease, diabetes, depression, asthma/COPD, arthritis and LBP.
 - Methods – four different approaches were used by the study to measure relative resource use – varying by the risk adjustment methodology employed and the focus on total service versus disease-related costs. For a given population and clinical category, measures of resource utilization were generally similar across the four different approaches to measurement described above, with only some modest variations.
- The study explored the potential for the use of a subset of services as a proxy for measuring resource use for all services (see Table 7). In this way, services that can be reliably measured could be the focus of initial measurement and also present a reasonable burden on health plans in collecting this information. The study found measures of relative resource utilization were generally similar using “selected” services

(inpatient, pharmacy, evaluation and management, and procedures, including ASC costs) versus measurement using all services.

- The relationship between population size and variation in measures of relative resource utilization – i.e., what is a sufficient sample size to produce consistently valid numerators and denominators and how large of a health plan is required to achieve these thresholds – was explored. Typical standard errors were measured for each condition – demonstrating the relationship between population size and likely precision of measures of relative resource use. A typical standard error for measuring total service relative resource utilization was observed to be approximately 0.025 at samples of 2,000 patients or more. In general, the standard errors were relatively higher for measures of disease-related services versus total services

Methodological solutions are emerging to measure such differences in a reliable and valid fashion. However, we are still challenged by how to characterize the value of these metrics and their meaning to purchasers. The importance of these metrics with respect to “bottom-line” considerations in the short- or mid-term is not immediately clear. To that end, we plan to engage in discussions with health care industry consultants, actuaries and other experts to assist in this process. In addition, NCQA is interested in refining the methods developed during this study and finalizing measure specifications for health plan or large health care organization comment and implementation. The feasibility, including health plan burden for collecting and programming measures, needs to be further explored by engaging health plans in a field test study. The field test would also inform an understanding of the metrics comparability, and regional differences. In addition, NCQA would like to explore other conditions, including acute episodes of illness. Lastly, a comparison of the relative resource utilization measures with quality outcomes is an important step to fully understanding health care services efficiencies. This study only looked at selected chronic conditions and it is unknown how the study developed method could be applied to acute events or illnesses. In addition, provider level resource consumption was not explored and it is likely that a more robust risk-adjustment method than the study-developed Age-Sex Morbidity, as well as patient or illness attribution, would need to be applied.

References

- ¹ Henry J. Kaiser Foundation and Health Research and Educational Trust, “Trends and Indicators in the Changing Health Care Marketplace” <http://www.kff.org/insurance/7031/ti2004-1-1.cfm> (Web accessed April 2005).
- ² Henry J. Kaiser Foundation and Health Research and Educational Trust, “Summary of Findings, Employer Health Benefits 2004 Annual Survey” <http://www.kff.org/insurance/7148/summary/index.cfm> (Web accessed May 2005).
- ³ Henry J. Kaiser Foundation and Health Research and Educational Trust, “Trends and Indicators in the Changing Health Care Marketplace” <http://www.kff.org/insurance/7031/ti2004-1-1.cfm> (Web accessed April 2005).
- ⁴ Henry J. Kaiser Foundation and Health Research and Educational Trust, “Summary of Findings, Employer Health Benefits 2004 Annual Survey” <http://www.kff.org/insurance/7148/summary/index.cfm> (Web accessed May 2005).
- ⁵ Center for Medicare and Medicaid Services, “An Overview of the U.S. Healthcare System: Two Decades of Change, 1980-2000,” *Office of the Actuary*. March 12 2002.
<http://www.cms.hhs.gov/charts/healthcaresystem/chapter1.pdf>
- ⁶ Tandon, Ajay, Lauer, Jeremy A., Evans, David B., Murray, Christopher J.L. “Health System Efficiency: Concepts” *Health System Performance Assessment*, chapter 50.
[http://whqlibdoc.who.int/publications/2003/9241562455_\(part4\)_chp50-60.pdf](http://whqlibdoc.who.int/publications/2003/9241562455_(part4)_chp50-60.pdf)
- ⁷ Wennberg, John E., Fisher, Elliot S., Skinner, Jonathan, S. “Geography and The Debate Over Medicare Reform,” *Health Affairs* Web Exclusive, February 2002.
- ⁸ E.S. Fisher et al., “Associations among Hospital Capacity, Utilization, and Mortality of U.S. Medicare Beneficiaries, Controlling for Sociodemographic Factors,” *Health Services Research*, 34 no. 6 (2000): 1351-1362.
- ⁹ Thorpe et. al., *Health Affairs*. August 25, 2004.

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Appendix Tables--Results Discussion

Appendix Tables A-1, A-1a, and A-2 provide further descriptive information on the study populations, including:

- Appendix Table A-1. Describes the overlap between the major clinical groupings for the combined commercial population. The table includes the percentage of the patients for a major clinical grouping that were also identified for one or more other clinical groupings included in the study.
- Appendix Table A-1a. Describes the overlap between the major clinical groupings for the combined commercial population in greater detail – showing the multiple overlaps between conditions. The table includes the percentage of the patients for a major clinical grouping that were identified for each combination of the other clinical groupings.

Question/Issue Addressed by Tables A-1 and A-1a -- How often will patients be included in multiple conditions/multiple measures?

- Appendix Table A-2. Describes the impact of excluding pharmacy data from the patient identification process – where pharmacy data is part of the patient identification algorithm. The table includes the number of patients identified for a clinical grouping using medical claims data only, as a percentage of the number identified using both medical and pharmacy claims. Since asthma and diabetes are the only categories which employ pharmacy data in identification, estimates are only included for these conditions.

Appendix Tables A-3a through A-3e. Focus on disease-related costs and their relationship to total costs. Estimates are provided by clinical grouping and service category. In particular,

- Table A-3a includes disease-related costs based on the ETG approach
- Table A-3b includes disease-related costs based on the DID approach
- Table A-3c includes disease-related costs based on the ETG approach as a percentage of total service costs
- Table A-3d includes disease-related costs based on the ETG approach as a percentage of total service costs
- Table A-3e includes disease-related costs based on the DID approach as a percentage of disease-related costs based on the ETG approach (the relative size of the disease-related amounts using each approach)

Question/Issue Addressed by Tables A-3a through A-3e -- How large are disease-related costs as a percentage of total costs for each clinical grouping? How do these amounts vary by service category? What is the difference in the magnitude of disease-related costs using the ETG vs. DID approach?

High-Level Interpretation

- Whether using the ETG or DID approach, disease-related costs represent a significant portion of total service costs for some conditions – in particular the cardiovascular conditions (approx 50-80%). These percentages vary by service category.

-
- Whether using the ETG or DID approach, disease-related costs represent a lesser portion of total service costs for some conditions – e.g., asthma, COPD, arthritis and LBP.
 - For many conditions, the magnitude of the disease-related costs is comparable whether using the ETG or DID approach – the exceptions are Asthma, COPD and Diabetes, with co-morbidity, where the DID amounts are higher (for total services and other service categories).

Appendix Tables A-4 and A-4a. Describes the distribution of patients by ERG morbidity category and their average costs (Table A-4a).

Question/Issue Addressed -- What is the distribution of patients across ERG morbidity categories? Will there be sufficient number of patients in each category to support analysis and the calculation of peer amounts? Do the ranges of risk effectively capture the “tails” of the risk distribution – particularly at the higher end? Do average costs increase with the level of risk?

High-Level Interpretation

- Table A-4 shows a reasonable distribution of patients across ERG morbidity categories. As expected, some clinical conditions require more differentiation at the higher or lower ends of the risk range (e.g., AMI at the higher end, Asthma at the lower end).
- Table A-4a shows increasing total costs with increasing risk --- suggesting the ERG groupings are capturing differences in overall risk for each of the patient populations.

Appendix Tables A-5 and A-5a. Describes the distribution of patients by Age-Sex morbidity category and their average costs (Table A-5a).

Question/Issue Addressed -- What is the distribution of patients across age-sex categories? Will there be sufficient number of patients in each category to support analysis and the calculation of peer amounts? Do the ranges effectively capture the “tails” of the age distribution – particularly at the higher and lower ends? Do average costs vary as expected with age and gender?

High-Level Interpretation

- Table A-5 shows a reasonable distribution of patients across the age-sex morbidity categories. As expected, some clinical conditions experience a different distribution of patients by age. (The missing amounts for some conditions reflect the age-based exclusions used in the patient identification approach.
- Table A-5a shows somewhat increasing total costs with increasing age --- although not as marked as shown in Table A-4a for ERGs – suggesting the age-sex groupings will not provide the same level of precision at the individual level in measuring risk within a clinical category. This is to be expected given the use of greater clinical information by ERGs, but the impact may average out at the population (plan) level – unless the mix of ERG risk differs significantly within an age-sex category across populations.

Appendix Tables A-6 and A-7 include Spearman Rank Order Correlations that address the following questions:

- What is the correlation in the relative population rankings of resource utilization across different types of service? – addresses the issue of potential proxies for using all services in measuring resource utilization.
- What is the correlation in the relative population rankings of resource utilization across the four different methodologies used (Total services, ERG Morbidity Approach; Total services, Age-Sex Morbidity Approach; Disease-related services, ETG Approach; Disease-related services, DID Approach) -- addresses the issue of the impact of methodological approach on the relative findings.

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 1: Description of Enrolled Populations used for Selecting Study Patients

Population	Size Group (Members)	% of Members Age < 35	% of Members Age > 64	% Female	% Pharmacy Benefit
Medicare Risk	0-250K	N/A	92%	59%	100%
Medicaid	251K-500K	90%	0%	56%	100%
Population A	501K+	51%	1%	51%	100%
Population B	501K+	45%		51%	63%
Population C	251K-500K	53%	3%	52%	85%
Population D	251K-500K	51%	1%	51%	86%
Population F	501K+	48%	2%	51%	90%
Population H	251K-500K	53%	1%	50%	89%
Population J	251K-500K	60%	1%	51%	91%
Population M	501K+	49%	3%	51%	86%
Population O	501K+	51%	2%	53%	91%
Population Q	0-250K	49%	1%	53%	72%
Population R	501K+	51%	1%	51%	100%
Population S	251K-500K	51%	2%	51%	100%

Note: A Medicare Risk, Medicaid and 12 Managed Care Populations were selected for the study. This table describes the approximate membership, demographics and pharmacy benefit status.

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 2: Percent Prevalence of Patients, by Population and Clinical Grouping

	Populations						
Clinical Grouping	Medicare Risk	Medicaid	A	B	C	D	F
AMI Year 2	0.6%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%
Angina	0.6%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Arthritis	6.8%	0.4%	0.9%	1.4%	1.0%	0.9%	1.3%
Asthma	2.6%	4.7%	3.4%	2.9%	2.4%	2.8%	3.7%
CAD	8.5%	0.1%	0.6%	1.1%	0.8%	0.5%	0.8%
CHF	4.8%	0.1%	0.1%	0.5%	0.2%	0.1%	0.2%
COPD	5.9%	0.3%	0.4%	0.8%	0.5%	0.4%	0.6%
Diabetes Type I	2.8%	0.5%	0.7%	0.7%	0.7%	0.6%	0.8%
Diabetes Type II	12.9%	0.8%	2.0%	2.4%	2.3%	1.9%	2.5%
Low Back Pain	3.4%	1.8%	2.2%	2.3%	2.3%	2.5%	2.5%

Clinical Grouping	Populations							All Commercial Plans (A-S)
	H	J	M	O	Q	R	S	
AMI Year 2	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Angina	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Arthritis	0.9%	0.5%	1.1%	0.8%	1.2%	0.7%	1.0%	1.0%
Asthma	2.6%	3.1%	2.5%	3.1%	2.7%	3.1%	1.5%	2.9%
CAD	0.5%	0.5%	0.7%	0.9%	0.4%	0.5%	0.9%	0.7%
CHF	0.1%	0.1%	0.3%	0.2%	0.1%	0.1%	0.2%	0.2%
COPD	0.3%	0.3%	0.5%	0.5%	0.3%	0.4%	0.4%	0.5%
Diabetes Type I	0.6%	0.5%	0.8%	0.6%	0.7%	0.7%	0.6%	0.7%
Diabetes Type II	1.8%	1.8%	2.7%	2.1%	2.6%	1.8%	2.3%	2.2%
Low Back Pain	2.2%	1.3%	2.4%	1.5%	2.7%	1.9%	2.2%	2.1%

- Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.
- Pharmacy data used as part of the patient identification for Asthma and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Within Cardiovascular, a patient is assigned to one condition using the following hierarchy, CHF, AMI, CAD, and Angina. Within Asthma/COPD, a member is assigned to one condition using a hierarchy of COPD and then Asthma. Within Diabetes, a member is assigned to one condition using a hierarchy of Type I and then Type II. Within Arthritis/LBP, a member is assigned to one condition using a hierarchy of Arthritis and then LBP.

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions

Final Results Table

Table 3: Percent Prevalence of Patients Identified with One or More Study Co-Morbidities

	% Patients with one or more Study CoMorbidity						
Clinical Grouping	Medicare Risk	Medicaid	Population A	Population B	Population C	Population D	Population F
AMI Year 2	42%	47%	31%	31%	33%	31%	30%
Angina	34%	62%	37%	30%	28%	36%	30%
Arthritis	0%	0%	0%	0%	0%	0%	0%
Asthma	66%	13%	23%	25%	23%	24%	25%
CAD	33%	66%	34%	31%	35%	35%	34%
CHF	51%	70%	59%	50%	53%	56%	58%
COPD	75%	59%	57%	68%	63%	55%	58%
Diabetes Type I	82%	58%	55%	60%	56%	53%	63%
Diabetes Type II	78%	60%	66%	73%	63%	65%	70%
Low Back Pain	0%	0%	0%	0%	0%	0%	0%

	% Patients with one or more Study CoMorbidity						
Clinical Grouping	Population H	Population J	Population M	Population O	Population Q	Population R	Population S
AMI Year 2	28%	27%	33%	27%	35%	31%	25%
Angina	14%	21%	32%	21%	32%	29%	27%
Arthritis	0%	0%	0%	0%	0%	0%	0%
Asthma	23%	13%	24%	21%	24%	22%	25%
CAD	33%	30%	36%	31%	33%	33%	29%
CHF	52%	52%	54%	50%	55%	57%	47%
COPD	61%	42%	64%	53%	53%	53%	64%
Diabetes Type I	56%	38%	59%	55%	57%	49%	63%
Diabetes Type II	64%	43%	64%	63%	57%	59%	66%
Low Back Pain	0%	0%	0%	0%	0%	0%	0%

These tables show the percentage of total member months for each clinical grouping with one or more study comorbidities: Asthma/COPD, Cardiovascular, including Hypertension, Diabetes, Depression, and Renal Failure (for Diabetes).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

**NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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Table 4: Total Costs PMPM, by Population and Clinical Groupings, Commercial Population

	Total Costs PMPM, by Population											
	A	B	C	D	F	H	J	M	O	Q	R	S
AMI	\$2,709	\$2,907	\$3,119	\$3,068	\$3,257	\$3,132	\$2,807	\$2,615	\$2,394	\$2,607	\$2,480	\$2,535
AMI w/Comorbid	\$3,531	\$3,406	\$3,332	\$3,381	\$3,829	\$4,180	\$4,826	\$3,398	\$3,347	\$3,384	\$3,540	\$3,304
Angina	\$739	\$815	\$795	\$690	\$782	\$915	\$762	\$828	\$516	\$690	\$687	\$709
Angina w/Comorbid	\$1,193	\$1,162	\$1,170	\$1,259	\$1,384	\$1,483	\$1,098	\$1,163	\$904	\$1,237	\$786	\$1,054
Arthritis	\$945	\$1,033	\$1,004	\$1,051	\$1,117	\$1,067	\$947	\$904	\$936	\$772	\$891	\$852
Asthma	\$305	\$366	\$380	\$340	\$367	\$337	\$300	\$317	\$326	\$300	\$283	\$315
Asthma w/Comorbid	\$734	\$873	\$886	\$794	\$896	\$869	\$881	\$811	\$793	\$717	\$695	\$767
CAD	\$991	\$1,005	\$1,159	\$1,326	\$1,214	\$1,422	\$1,112	\$1,128	\$951	\$980	\$950	\$1,118
CAD w/Comorbid	\$1,497	\$1,546	\$1,755	\$2,019	\$1,673	\$1,726	\$1,791	\$1,604	\$1,460	\$1,284	\$1,414	\$1,641
CHF	\$2,573	\$2,002	\$3,574	\$2,148	\$2,932	\$2,497	\$2,585	\$2,098	\$2,128	\$2,188	\$2,043	\$2,134
CHF w/Comorbid	\$3,343	\$2,965	\$2,807	\$3,101	\$4,147	\$3,563	\$4,157	\$3,287	\$3,367	\$3,141	\$3,030	\$2,687
COPD	\$721	\$775	\$975	\$798	\$729	\$911	\$704	\$781	\$580	\$636	\$674	\$909
COPD w/Comorbid	\$1,643	\$1,775	\$1,754	\$1,813	\$1,780	\$1,715	\$1,860	\$1,788	\$1,515	\$1,561	\$1,570	\$1,808
Diabetes I	\$583	\$675	\$586	\$678	\$690	\$622	\$687	\$552	\$641	\$609	\$589	\$540
Diabetes I w/Comorbid	\$1,328	\$1,538	\$1,480	\$1,389	\$1,521	\$1,400	\$1,708	\$1,383	\$1,415	\$1,095	\$1,344	\$1,219
Diabetes II	\$394	\$463	\$413	\$435	\$460	\$422	\$419	\$353	\$397	\$351	\$344	\$311
Diabetes II w/Comorbid	\$708	\$880	\$823	\$800	\$861	\$750	\$891	\$731	\$742	\$606	\$656	\$703
LBP	\$579	\$678	\$704	\$655	\$741	\$713	\$593	\$663	\$648	\$518	\$512	\$653

-This table shows the total costs PMPM for Year 2 for patients identified for each clinical grouping. Total costs equals the costs for all services, including medical and pharmacy services. For pharmacy services costs, only members with a pharmacy benefit were included.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

Prepared for NCQA by IHCIS, December 2004. Proprietary and Confidential

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions

Final Results Table

Table 5: Cost PMPM, by Clinical Grouping and Service Category, Commercial Population

All Commercial Populations		PMPM Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpat.	Lab	Other	Phys Medicine	Procs	RX	Rad.	Total
AMI	4,051	\$25	\$22	\$112	\$93	\$5	\$54	\$1,712	\$37	\$235	\$37	\$169	\$160	\$74	\$2,735
AMI w/Comorbid	1,750	\$37	\$34	\$119	\$133	\$8	\$65	\$2,180	\$41	\$305	\$37	\$203	\$275	\$85	\$3,523
Angina	2,146	\$34	\$12	\$69	\$52	\$6	\$21	\$145	\$26	\$79	\$10	\$39	\$131	\$65	\$689
Angina w/Comorbid	818	\$34	\$18	\$74	\$71	\$12	\$30	\$284	\$31	\$123	\$10	\$61	\$276	\$87	\$1,112
Arthritis	67,805	\$44	\$14	\$26	\$61	\$8	\$13	\$286	\$28	\$131	\$31	\$85	\$174	\$67	\$970
Asthma	157,768	\$13	\$6	\$11	\$33	\$8	\$12	\$37	\$11	\$48	\$7	\$17	\$102	\$22	\$327
Asthma w/Comorbid	46,204	\$30	\$12	\$33	\$56	\$18	\$19	\$153	\$27	\$99	\$13	\$42	\$253	\$52	\$807
CAD	34,212	\$35	\$13	\$75	\$54	\$4	\$17	\$403	\$29	\$105	\$14	\$72	\$174	\$72	\$1,066
CAD w/Comorbid	16,571	\$44	\$20	\$90	\$79	\$7	\$25	\$591	\$39	\$165	\$18	\$98	\$315	\$88	\$1,580
CHF	6,540	\$34	\$27	\$102	\$117	\$5	\$36	\$1,288	\$40	\$230	\$13	\$101	\$200	\$69	\$2,261
CHF w/Comorbid	7,283	\$44	\$44	\$109	\$180	\$9	\$56	\$1,748	\$54	\$398	\$18	\$128	\$367	\$92	\$3,247
COPD	13,772	\$23	\$12	\$27	\$55	\$7	\$19	\$203	\$21	\$110	\$8	\$38	\$148	\$53	\$725
COPD w/Comorbid	19,679	\$36	\$24	\$63	\$105	\$10	\$35	\$738	\$34	\$204	\$13	\$78	\$281	\$80	\$1,702
Diabetes I	20,129	\$19	\$9	\$11	\$38	\$6	\$12	\$99	\$23	\$115	\$8	\$28	\$218	\$31	\$618
Diabetes I w/Comorbid	26,082	\$38	\$19	\$43	\$80	\$8	\$24	\$462	\$39	\$192	\$14	\$74	\$356	\$60	\$1,409
Diabetes II	54,976	\$17	\$7	\$12	\$31	\$4	\$7	\$43	\$20	\$52	\$8	\$23	\$142	\$28	\$393
Diabetes II w/Comorbid	99,466	\$27	\$11	\$32	\$51	\$5	\$12	\$189	\$28	\$89	\$11	\$45	\$219	\$45	\$765
LBP	146,352	\$34	\$11	\$18	\$49	\$10	\$21	\$119	\$22	\$85	\$34	\$52	\$118	\$73	\$646

-This table shows the costs PMPM for Year 2 for patients identified for each clinical grouping, by service category. Total costs equals the costs for all services, including medical and pharmacy services. For pharmacy services costs, only members with a pharmacy benefit were included.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions

Final Results for Presentation, 12/03/04

Table 7 (cont): Cost PMPM, by Clinical Grouping and Service Category, Commercial Population (Percentage)

All Commercial Populations		Service Category Costs as a Percentage of Total Service Costs													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpat.	Lab	Other	Phys Medicine	Procs	RX	Rad.	Total
AMI	4,051	1%	1%	4%	3%	0%	2%	63%	1%	9%	1%	6%	6%	3%	100%
AMI w/Comorbid	1,750	1%	1%	3%	4%	0%	2%	62%	1%	9%	1%	6%	8%	2%	100%
Angina	2,146	5%	2%	10%	7%	1%	3%	21%	4%	11%	1%	6%	19%	9%	100%
Angina w/Comorbid	818	3%	2%	7%	6%	1%	3%	26%	3%	11%	1%	5%	25%	8%	100%
Arthritis	67,805	5%	1%	3%	6%	1%	1%	30%	3%	13%	3%	9%	18%	7%	100%
Asthma	157,768	4%	2%	3%	10%	2%	4%	11%	3%	15%	2%	5%	31%	7%	100%
Asthma w/Comorbid	46,204	4%	1%	4%	7%	2%	2%	19%	3%	12%	2%	5%	31%	6%	100%
CAD	34,212	3%	1%	7%	5%	0%	2%	38%	3%	10%	1%	7%	16%	7%	100%
CAD w/Comorbid	16,571	3%	1%	6%	5%	0%	2%	37%	2%	10%	1%	6%	20%	6%	100%
CHF	6,540	2%	1%	5%	5%	0%	2%	57%	2%	10%	1%	4%	9%	3%	100%
CHF w/Comorbid	7,283	1%	1%	3%	6%	0%	2%	54%	2%	12%	1%	4%	11%	3%	100%
COPD	13,772	3%	2%	4%	8%	1%	3%	28%	3%	15%	1%	5%	20%	7%	100%
COPD w/Comorbid	19,679	2%	1%	4%	6%	1%	2%	43%	2%	12%	1%	5%	16%	5%	100%
Diabetes I	20,129	3%	1%	2%	6%	1%	2%	16%	4%	19%	1%	5%	35%	5%	100%
Diabetes I w/Comorbid	26,082	3%	1%	3%	6%	1%	2%	33%	3%	14%	1%	5%	25%	4%	100%
Diabetes II	54,976	4%	2%	3%	8%	1%	2%	11%	5%	13%	2%	6%	36%	7%	100%
Diabetes II w/Comorbid	99,466	4%	1%	4%	7%	1%	2%	25%	4%	12%	1%	6%	29%	6%	100%
LBP	146,352	5%	2%	3%	8%	2%	3%	18%	3%	13%	5%	8%	18%	11%	100%

-This table shows the costs PMPM for Year 2 for patients identified for each clinical grouping, by service category. Total costs equals the costs for all services, including medical and pharmacy services. For pharmacy services costs, only members with a pharmacy benefit were included.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 6: Total Disease Related Costs PMPM, by Population and Service Category, using Episode Treatment Groups (ETGs) Methodology, Commercial Population

All Commercial Populations		PMPM Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpat.	Lab	Other	Phys Medicine	Procs	RX	Rad.	Total
AMI	4,051	\$10	\$14	\$98	\$68	\$1	\$45	\$1,573	\$23	\$178	\$30	\$140	\$74	\$45	\$2,299
AMI w/Comorbid	1,750	\$13	\$21	\$103	\$96	\$0	\$52	\$1,889	\$25	\$207	\$28	\$159	\$153	\$50	\$2,797
Angina	2,146	\$11	\$5	\$50	\$26	\$0	\$12	\$80	\$10	\$26	\$3	\$8	\$49	\$31	\$310
Angina w/Comorbid	818	\$9	\$8	\$54	\$41	\$0	\$14	\$155	\$15	\$50	\$4	\$20	\$147	\$43	\$561
Arthritis	67,805	\$11	\$4	\$3	\$20	\$0	\$2	\$162	\$6	\$43	\$21	\$42	\$43	\$22	\$381
Asthma	157,768	\$0	\$1	\$4	\$8	\$0	\$4	\$5	\$1	\$4	\$0	\$0	\$40	\$2	\$69
Asthma w/Comorbid	46,204	\$0	\$1	\$5	\$8	\$0	\$4	\$12	\$1	\$6	\$0	\$0	\$50	\$3	\$92
CAD	34,212	\$12	\$5	\$60	\$31	\$0	\$10	\$310	\$13	\$50	\$7	\$37	\$73	\$40	\$647
CAD w/Comorbid	16,571	\$15	\$10	\$71	\$51	\$0	\$15	\$417	\$21	\$81	\$9	\$50	\$174	\$47	\$961
CHF	6,540	\$12	\$12	\$75	\$63	\$0	\$20	\$788	\$19	\$102	\$7	\$51	\$84	\$29	\$1,262
CHF w/Comorbid	7,283	\$15	\$23	\$82	\$114	\$0	\$36	\$1,168	\$28	\$190	\$10	\$64	\$203	\$41	\$1,973
COPD	13,772	\$1	\$2	\$9	\$16	\$0	\$6	\$53	\$2	\$20	\$0	\$1	\$45	\$7	\$163
COPD w/Comorbid	19,679	\$1	\$3	\$9	\$19	\$0	\$7	\$101	\$2	\$22	\$0	\$1	\$50	\$6	\$221
Diabetes I	20,129	\$2	\$3	\$2	\$19	\$0	\$5	\$24	\$10	\$48	\$2	\$7	\$143	\$3	\$268
Diabetes I w/Comorbid	26,082	\$4	\$5	\$5	\$32	\$0	\$8	\$66	\$14	\$45	\$2	\$14	\$178	\$6	\$380
Diabetes II	54,976	\$1	\$1	\$2	\$12	\$0	\$1	\$5	\$7	\$6	\$1	\$2	\$67	\$2	\$108
Diabetes II w/Comorbid	99,466	\$1	\$2	\$3	\$16	\$0	\$2	\$14	\$9	\$10	\$1	\$4	\$89	\$3	\$156
LBP	146,352	\$13	\$4	\$3	\$18	\$0	\$7	\$43	\$3	\$29	\$28	\$25	\$32	\$35	\$239

-This table shows the disease-related costs PMPM for Year 2 for patients identified for each clinical grouping, by service category. Disease-related costs were identified for this table using Symmetry's Episode Treatment Groups (ETGs). To do this, Year 2 medical and pharmacy claims for each member were grouped using ETGs. Specific ETGs determined to be disease-related were mapped to each clinical category. The patient's disease-related ETG experience for each clinical category was then summarized by service category.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

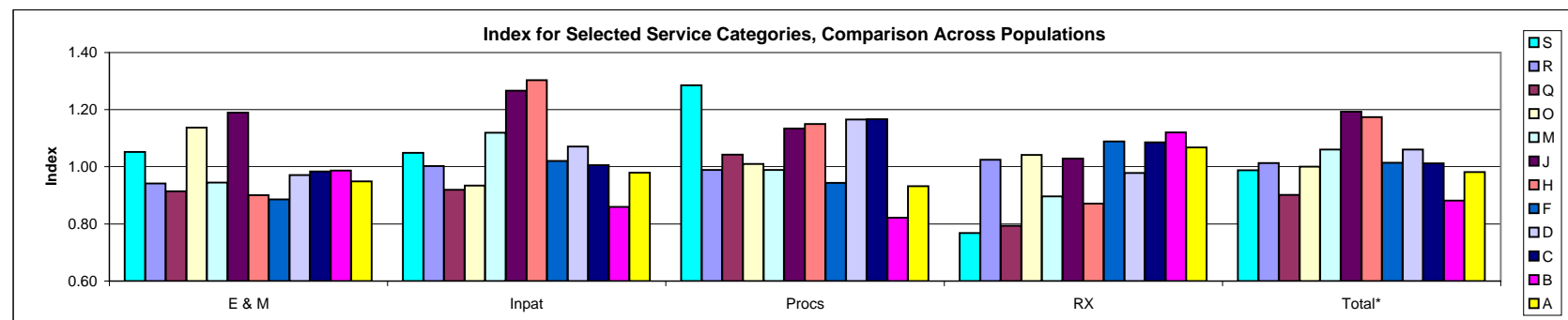
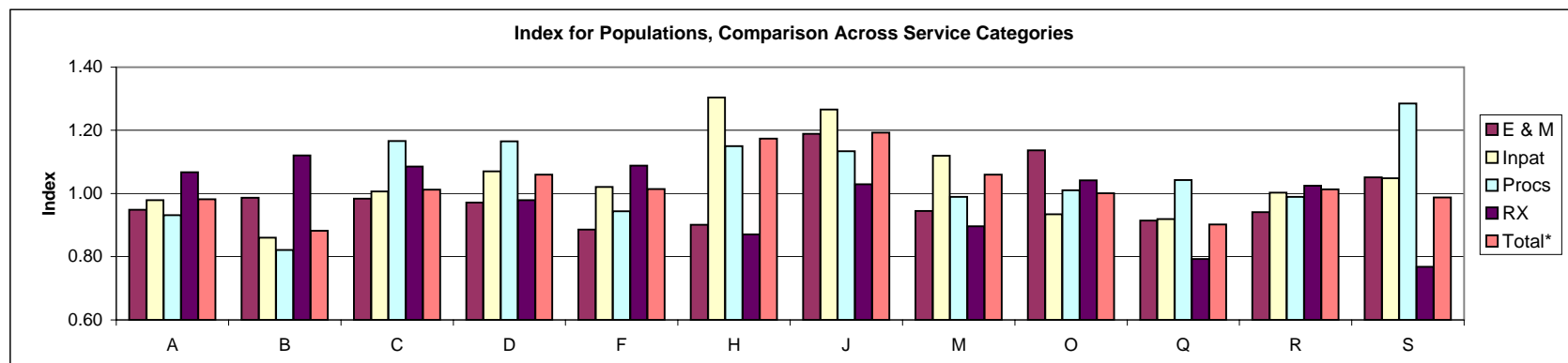
Episode Treatment Groups are proprietary to Symmetry Health Data Systems.

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 7: Resource Consumption Index, Total Patient Costs, by Population and Service Category, Cardiovascular Clinical Groupings
ERGs used for Risk Adjustment

Population	Risk Adjusted Relative Resource Consumption Index, by Service Category -- Total Services													
	AmbSrg	Consult	Diagn	E & M	ER	Inpat	Lab	Other	PhysMed	Procs	RX	Radiol	Total*	Total
A	0.80	0.96	1.01	0.95	0.82	0.98	1.10	1.04	0.92	0.93	1.07	1.05	0.98	1.00
B	0.74	0.88	0.82	0.99	0.83	0.86	0.81	0.90	0.93	0.82	1.12	0.93	0.88	0.88
C	0.72	0.87	1.07	0.98	0.66	1.01	0.74	0.92	1.11	1.17	1.09	0.94	1.01	1.00
D	0.77	0.81	1.91	0.97	1.82	1.07	1.71	1.61	2.12	1.17	0.98	1.55	1.06	1.23
F	0.84	0.82	1.28	0.89	1.24	1.02	1.60	1.29	1.79	0.94	1.09	1.28	1.01	1.10
H	1.14	0.84	1.70	0.90	1.75	1.30	1.58	1.48	1.53	1.15	0.87	1.56	1.17	1.27
J	0.79	1.24	1.68	1.19	1.47	1.27	0.68	0.92	1.06	1.13	1.03	1.19	1.19	1.18
M	0.84	1.07	0.94	0.95	1.53	1.12	0.56	1.05	1.16	0.99	0.90	0.96	1.06	1.04
O	1.54	1.33	0.81	1.14	0.75	0.93	0.33	0.61	0.66	1.01	1.04	0.80	1.00	0.92
Q	0.54	0.59	1.26	0.91	1.32	0.92	1.07	1.24	0.86	1.04	0.79	1.02	0.90	0.97
R	1.48	1.02	0.73	0.94	0.79	1.00	0.92	0.72	0.29	0.99	1.02	0.85	1.01	0.95
S	0.97	0.80	0.82	1.05	0.45	1.05	2.84	1.05	0.54	1.29	0.77	1.00	0.99	1.02
% of Total	3%	1%	6%	6%	2%	52%	2%	n/a	1%	6%	16%	5%	85%	100%



-This table shows the resource consumption index for a clinical category, by Population. The index is the ratio of actual to peers experience, adjusted for risk. Peers experience is the expected resource consumption if the peers had a similar mix of patients to that observed for the population. For this table, ERG Morbidity and clinical categories w/ co-morbidities are used for the risk adjustment.

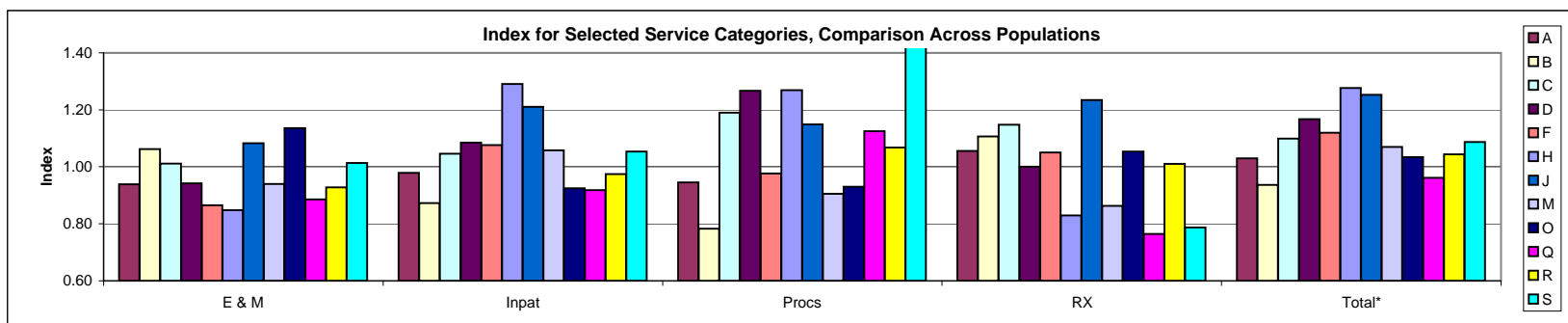
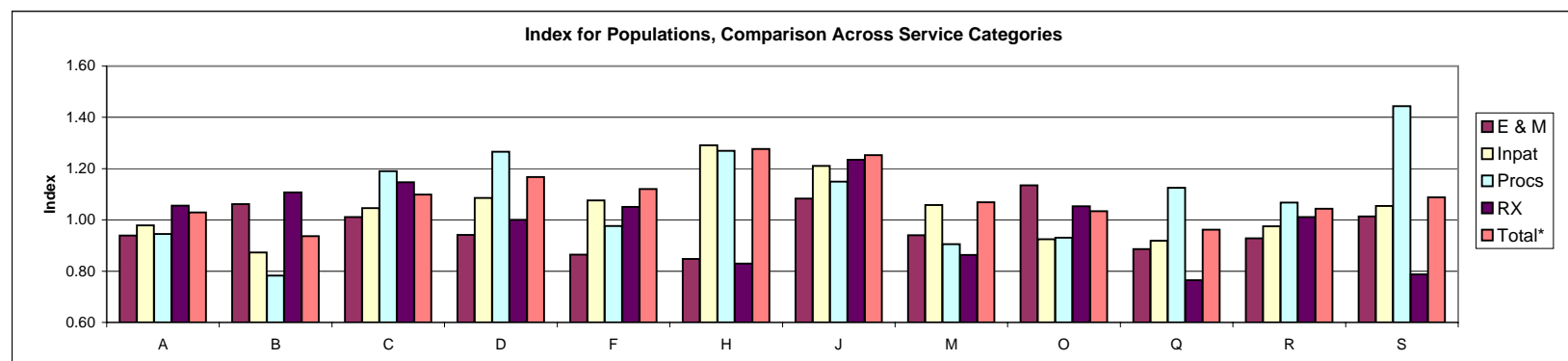
Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology". Patients exceeding \$100,000 in total costs excluded from analysis.

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year. -Pharmacy data used as part of the patient identification for Asthma and Diabetes

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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Table 8: Resource Consumption Index, Disease-Related Patient Costs, by Population and Service Category,
Cardiovascular Clinical Groupings
ETGs used for Assignment of Disease-Related Costs

Population	Risk Adjusted Relative Resource Consumption Index, by Service Category -- Disease-Related Services													
	AmbSrg	Consult	Diagn	E & M	ER	Inpat	Lab	Other	PhysMed	Procs	RX	Radiol	Total*	Total
A	0.39	0.96	1.02	0.94	0.78	0.98	1.06	1.08	1.30	0.95	1.06	1.04	1.03	0.99
B	0.38	0.94	0.84	1.06	0.77	0.87	0.78	1.00	1.15	0.78	1.11	0.89	0.94	0.89
C	0.39	1.00	1.08	1.01	0.64	1.05	0.65	1.00	1.23	1.19	1.15	0.93	1.10	1.03
D	0.37	0.82	1.99	0.94	1.97	1.09	1.78	1.85	2.43	1.27	1.00	1.50	1.17	1.26
F	0.43	0.89	1.31	0.86	1.31	1.08	1.47	1.35	1.71	0.98	1.05	1.31	1.12	1.12
H	0.67	0.82	1.75	0.85	1.87	1.29	1.60	1.43	1.52	1.27	0.83	1.49	1.28	1.28
J	0.38	1.03	1.68	1.08	1.39	1.21	0.57	0.83	0.89	1.15	1.23	1.07	1.25	1.18
M	0.31	1.03	0.94	0.94	1.57	1.06	0.51	1.12	1.10	0.91	0.86	0.97	1.07	1.01
O	2.46	1.25	0.77	1.14	0.69	0.92	0.20	0.47	0.40	0.93	1.05	0.82	1.03	0.90
Q	0.63	0.58	1.27	0.89	1.41	0.92	1.05	1.56	1.06	1.13	0.76	0.85	0.96	1.00
R	2.25	1.01	0.70	0.93	0.78	0.97	0.81	0.70	0.17	1.07	1.01	0.79	1.04	0.93
S	1.38	0.83	0.78	1.01	0.44	1.05	3.68	1.19	0.43	1.44	0.79	1.09	1.09	1.07
% of Total	1%	1%	7%	5%	2%	54%	2%	n/a	1%	5%	11%	4%	79%	100%



-This table shows the disease-related resource consumption index for a clinical category, by Population. The index is the ratio of actual to peers experience, adjusted for risk. Peers experience is the expected resource consumption if the peers had a similar mix of patients to that observed for the population. For this table, ETGs, clinical categories w/ co-morbidities are used for the risk adjustment. "Index for total" services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology". Patients exceeding \$100,000 in total costs excluded from analysis.

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year. -Pharmacy data used as part of the patient identification for Asthma, Diabetes, and Depression.

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 9: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Measurement Approach, Across Major Clinical Categories

Population	Risk Adjusted Relative Resource Consumption Index, by Measurement Method and Major Clinical Category -- Total Costs*									
	Total Services, ERG					Total Services, Asex				
	Cardiovasc	Asthma/ COPD	Diabetes	Arthritis/ LBP	All Study Conditions	Cardiovasc	Asthma/ COPD	Diabetes	Arthritis/ LBP	All Study Conditions
A	0.98	0.96	1.00	0.99	0.98	0.97	0.93	0.97	0.97	0.96
B	0.88	0.98	1.00	0.97	0.95	0.97	1.02	1.06	0.97	1.00
C	1.01	1.04	1.04	1.06	1.04	1.04	1.08	1.04	1.07	1.06
D	1.06	0.98	1.01	0.97	1.00	1.01	0.93	0.98	0.93	0.96
F	1.01	0.97	0.99	0.98	0.99	1.01	0.99	1.01	1.02	1.01
H	1.17	1.03	1.01	1.10	1.07	1.09	0.99	0.94	1.04	1.01
J	1.19	1.11	1.15	1.07	1.13	1.11	1.09	1.15	0.98	1.09
M	1.06	1.06	1.00	1.02	1.03	1.04	1.07	0.99	1.02	1.03
O	1.00	1.02	1.05	1.08	1.04	0.98	1.02	1.07	1.10	1.04
Q	0.90	0.87	0.85	0.81	0.85	0.89	0.86	0.82	0.77	0.82
R	1.01	0.98	1.00	0.98	0.99	0.99	0.95	0.98	0.97	0.97
S	0.99	0.99	0.90	0.92	0.94	0.98	1.02	0.89	0.93	0.94
StdDev	0.092	0.059	0.073	0.081	0.070	0.060	0.070	0.086	0.084	0.068

Population	Risk Adjusted Relative Resource Consumption Index, by Measurement Method and Major Clinical Category -- Total Costs*									
	Disease-Related Services, ETGs					Disease-Related Services, DID				
	Cardiovasc	Asthma/ COPD	Diabetes	Arthritis/ LBP	All Study Conditions	Cardiovasc	Asthma/ COPD	Diabetes	Arthritis/ LBP	All Study Conditions
A	1.03	1.02	1.02	1.15	0.98	0.99	0.96	0.96	0.96	0.97
B	0.94	1.10	1.17	1.15	0.96	0.93	1.13	1.18	1.03	1.03
C	1.10	1.11	1.03	1.28	1.06	1.04	1.14	1.04	1.11	1.08
D	1.17	0.98	1.08	1.19	1.00	1.24	1.02	1.17	1.13	1.00
F	1.12	1.00	1.08	1.24	1.04	1.12	0.96	1.08	1.12	1.00
H	1.28	1.03	0.91	1.48	1.10	1.27	1.14	1.04	1.32	1.12
J	1.25	1.08	1.22	1.19	1.12	1.16	1.04	1.20	0.96	1.12
M	1.07	1.10	0.95	1.15	0.99	0.98	1.00	0.91	0.97	0.96
O	1.03	1.04	1.07	1.14	1.01	0.90	0.94	0.96	0.89	1.01
Q	0.96	0.95	0.96	0.91	0.85	1.00	0.99	0.93	0.79	0.86
R	1.04	0.98	0.99	1.10	0.98	0.93	0.92	0.90	0.86	0.96
S	1.09	0.96	0.79	1.13	0.95	1.06	1.05	0.86	0.98	0.97
StdDev	0.103	0.057	0.115	0.132	0.073	0.123	0.078	0.119	0.142	0.074

*This table compares the relative resource consumption index findings across different methods, by Major Clinical Category and Population. The index is the ratio of actual to peers experience,

adjusted for risk. Peers experience is the expected resource consumption if the peers had a similar mix of patients to that observed for the population.

For this table, different methodologies are used for services included (disease-related and all services) and population risk adjustment (ERGs and Age-Sex).

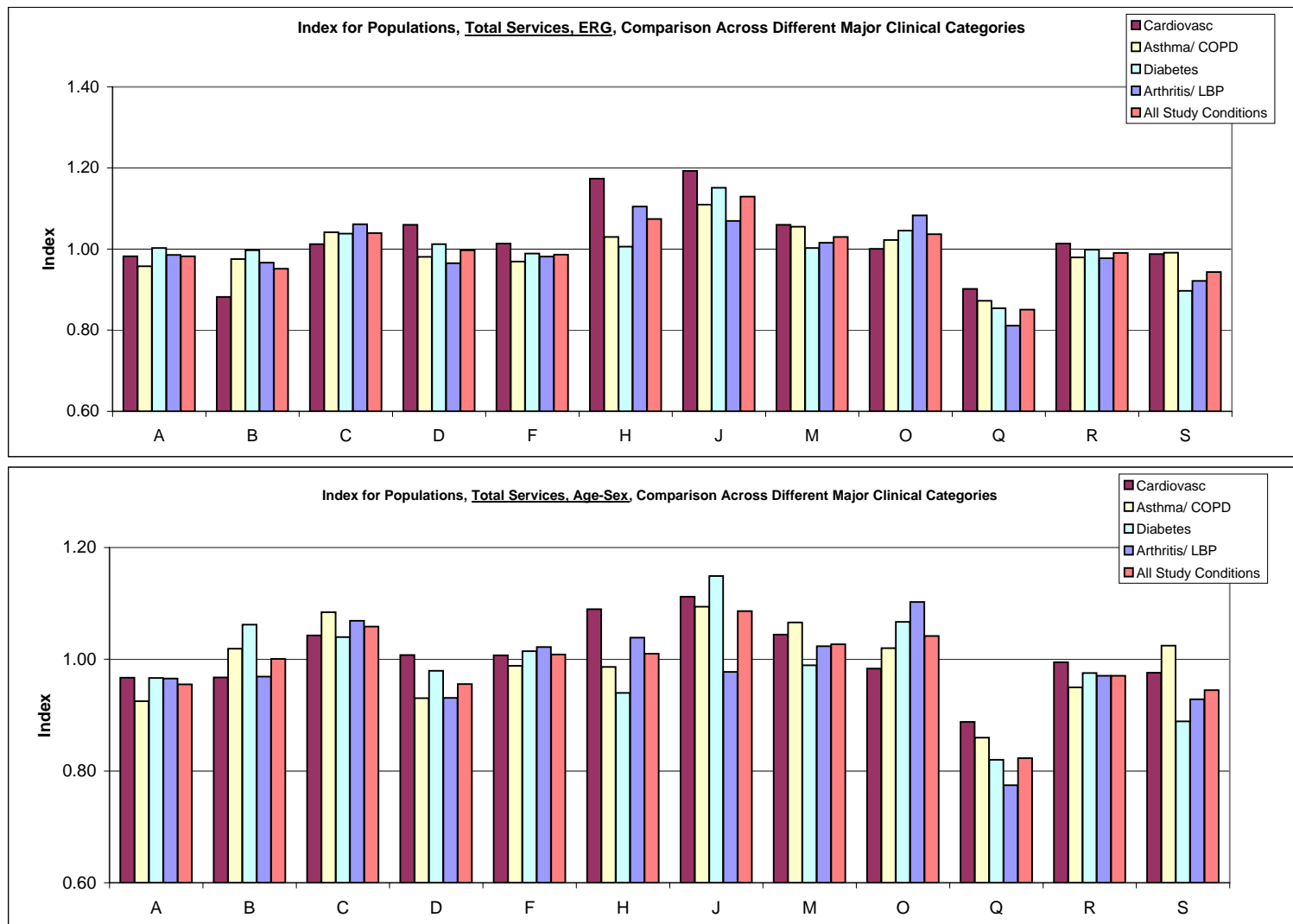
Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology". Patients exceeding \$100,000 in total costs excluded from analysis.

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year. -Pharmacy data used as part of the patient identification for Asthma and Diabetes.

Standard deviation of index measures across populations is shown at the bottom of each column. This can be considered a measure of the variation in the index across populations.

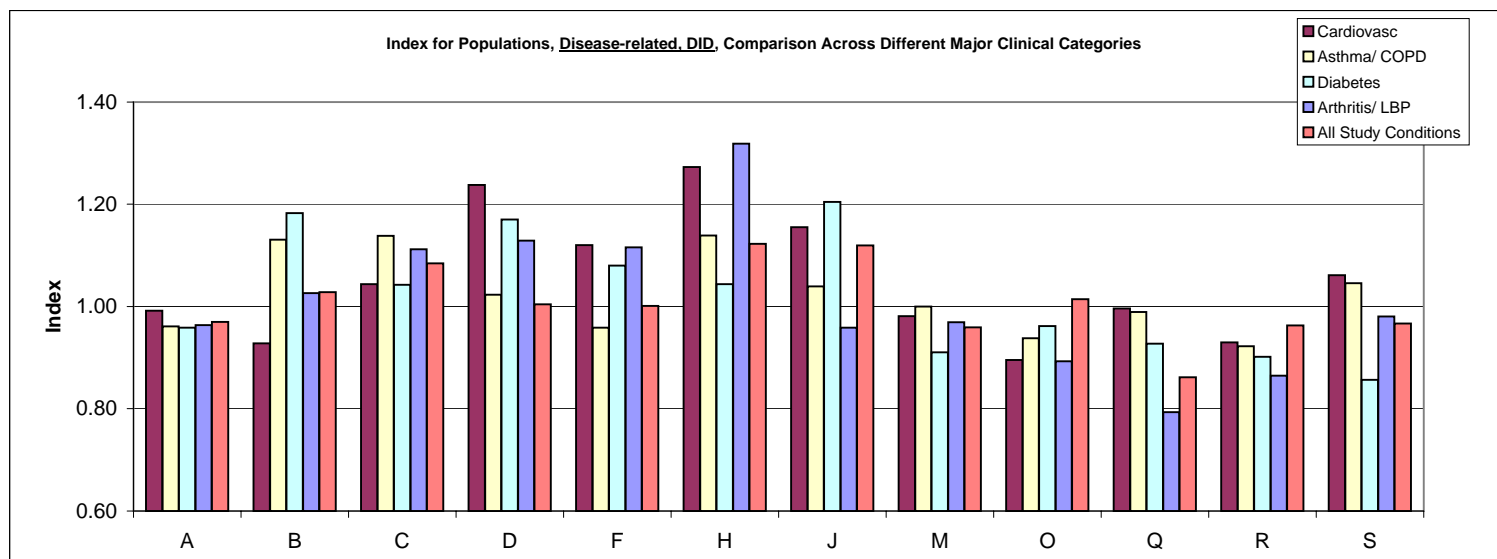
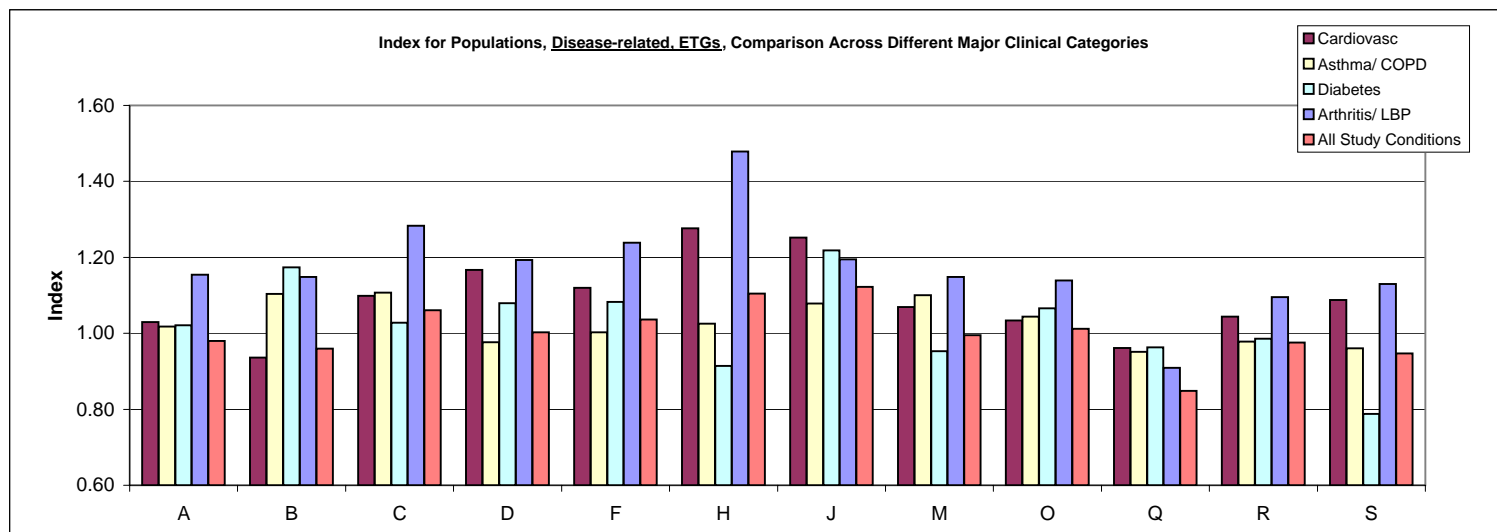
NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results for Presentation, 12/09/04

Table 9: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Measurement Approach, Across Major Clinical Categories



NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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Table 9: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Measurement Approach, Across Major Clinical Categories



NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 10: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Major Clinical Category, including All Study Conditions and Diseases

Population	Risk Adjusted Relative Resource Consumption Index, by Measurement Method and Major Clinical Category -- Total Costs*											
	Cardiovascular				Asthma/COPD				Diabetes			
	Total Services, ERG	Total Services, Asex	Related Services, ETGs	Disease-Related Services, DID	Total Services, ERG	Total Services, Asex	Related Services, ETGs	Disease-Related Services, DID	Total Services, ERG	Total Services, Asex	Related Services, ETGs	Disease-Related Services, DID
A	0.98	0.97	1.03	0.99	0.96	0.93	1.02	0.96	1.00	0.97	1.02	0.96
B	0.88	0.97	0.94	0.93	0.98	1.02	1.10	1.13	1.00	1.06	1.17	1.18
C	1.01	1.04	1.10	1.04	1.04	1.08	1.11	1.14	1.04	1.04	1.03	1.04
D	1.06	1.01	1.17	1.24	0.98	0.93	0.98	1.02	1.01	0.98	1.08	1.17
F	1.01	1.01	1.12	1.12	0.97	0.99	1.00	0.96	0.99	1.01	1.08	1.08
H	1.17	1.09	1.28	1.27	1.03	0.99	1.03	1.14	1.01	0.94	0.91	1.04
J	1.19	1.11	1.25	1.16	1.11	1.09	1.08	1.04	1.15	1.15	1.22	1.20
M	1.06	1.04	1.07	0.98	1.06	1.07	1.10	1.00	1.00	0.99	0.95	0.91
O	1.00	0.98	1.03	0.90	1.02	1.02	1.04	0.94	1.05	1.07	1.07	0.96
Q	0.90	0.89	0.96	1.00	0.87	0.86	0.95	0.99	0.85	0.82	0.96	0.93
R	1.01	0.99	1.04	0.93	0.98	0.95	0.98	0.92	1.00	0.98	0.99	0.90
S	0.99	0.98	1.09	1.06	0.99	1.02	0.96	1.05	0.90	0.89	0.79	0.86
StdDev	0.092	0.060	0.103	0.123	0.059	0.070	0.057	0.078	0.073	0.086	0.115	0.119

Population	Risk Adjusted Relative Resource Consumption Index, by Measurement Method and Major Clinical Category -- Total Costs*									
	Arthritis/LBP				Population	All Study Conditions				
	Total Services, ERG	Total Services, Asex	Related Services, ETGs	Disease-Related Services, DID		Total Services, ERG	Total Services, Asex	Related Services, ETGs	Disease-Related Services, DID	
A	0.99	0.97	1.15	0.96	A	0.98	0.96	0.98	0.97	
B	0.97	0.97	1.15	1.03	B	0.95	1.00	0.96	1.03	
C	1.06	1.07	1.28	1.11	C	1.04	1.06	1.06	1.08	
D	0.97	0.93	1.19	1.13	D	1.00	0.96	1.00	1.00	
F	0.98	1.02	1.24	1.12	F	0.99	1.01	1.04	1.00	
H	1.10	1.04	1.48	1.32	H	1.07	1.01	1.10	1.12	
J	1.07	0.98	1.19	0.96	J	1.13	1.09	1.12	1.12	
M	1.02	1.02	1.15	0.97	M	1.03	1.03	0.99	0.96	
O	1.08	1.10	1.14	0.89	O	1.04	1.04	1.01	1.01	
Q	0.81	0.77	0.91	0.79	Q	0.85	0.82	0.85	0.86	
R	0.98	0.97	1.10	0.86	R	0.99	0.97	0.98	0.96	
S	0.92	0.93	1.13	0.98	S	0.94	0.94	0.95	0.97	
StdDev	0.081	0.084	0.132	0.142	StdDev	0.070	0.068	0.073	0.074	

-This table compares the relative resource consumption index findings across different methods, by Major Clinical Category and Population. The index is the ratio of actual to peers experience, adjusted for risk. Peers experience is the expected resource consumption if the peers had a similar mix of patients to that observed for the population.

For this table, different methodologies are used for services included (disease-related and all services) and population risk adjustment (ERGs and Age-Sex).

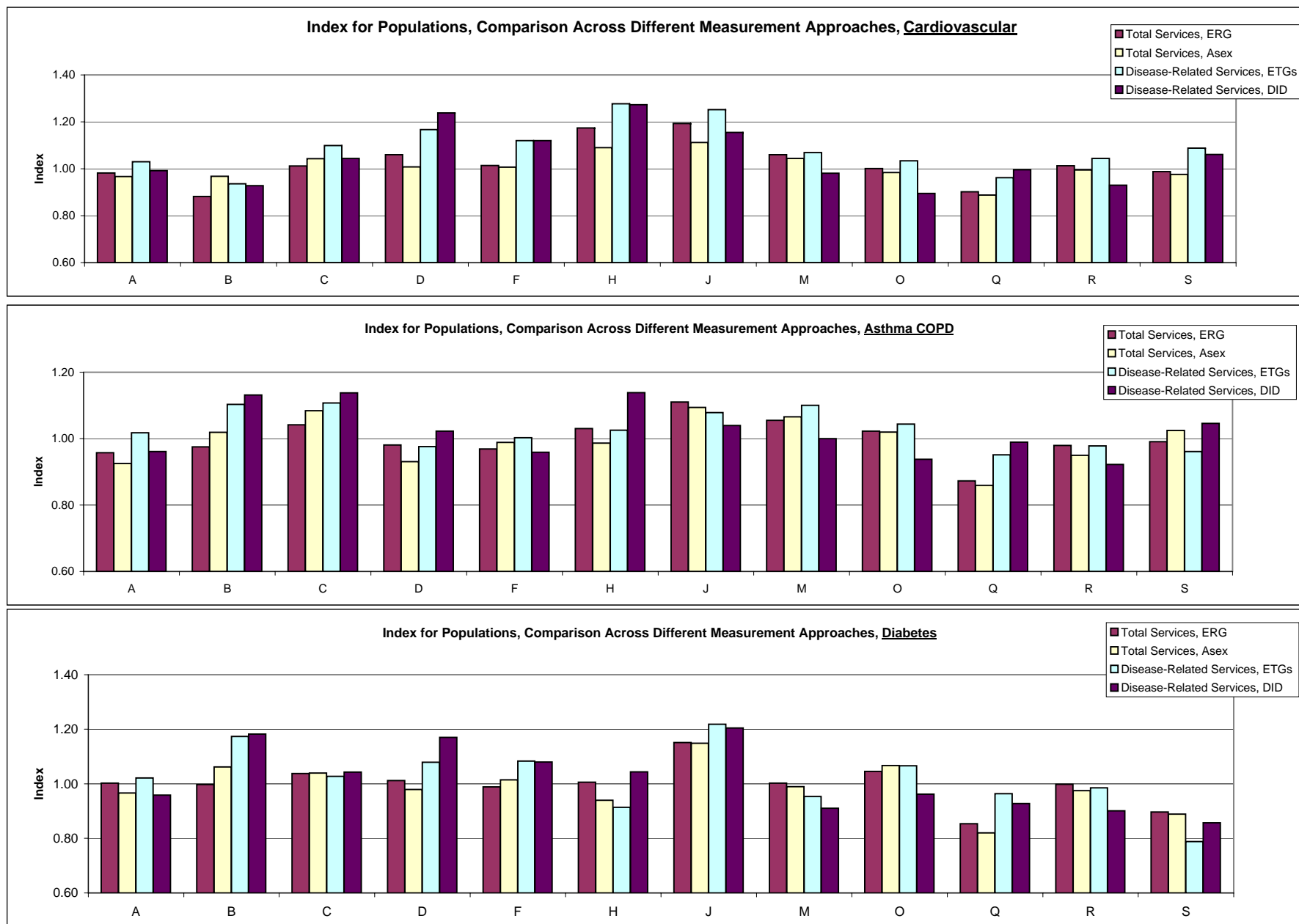
Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology". Patients exceeding \$100,000 in total costs excluded from analysis.

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year. -Pharmacy data used as part of the patient identification for Asthma and Diabetes

Standard deviation of index measures across populations is shown at the bottom of each column. This can be considered a measure of the variation in the index across populations.

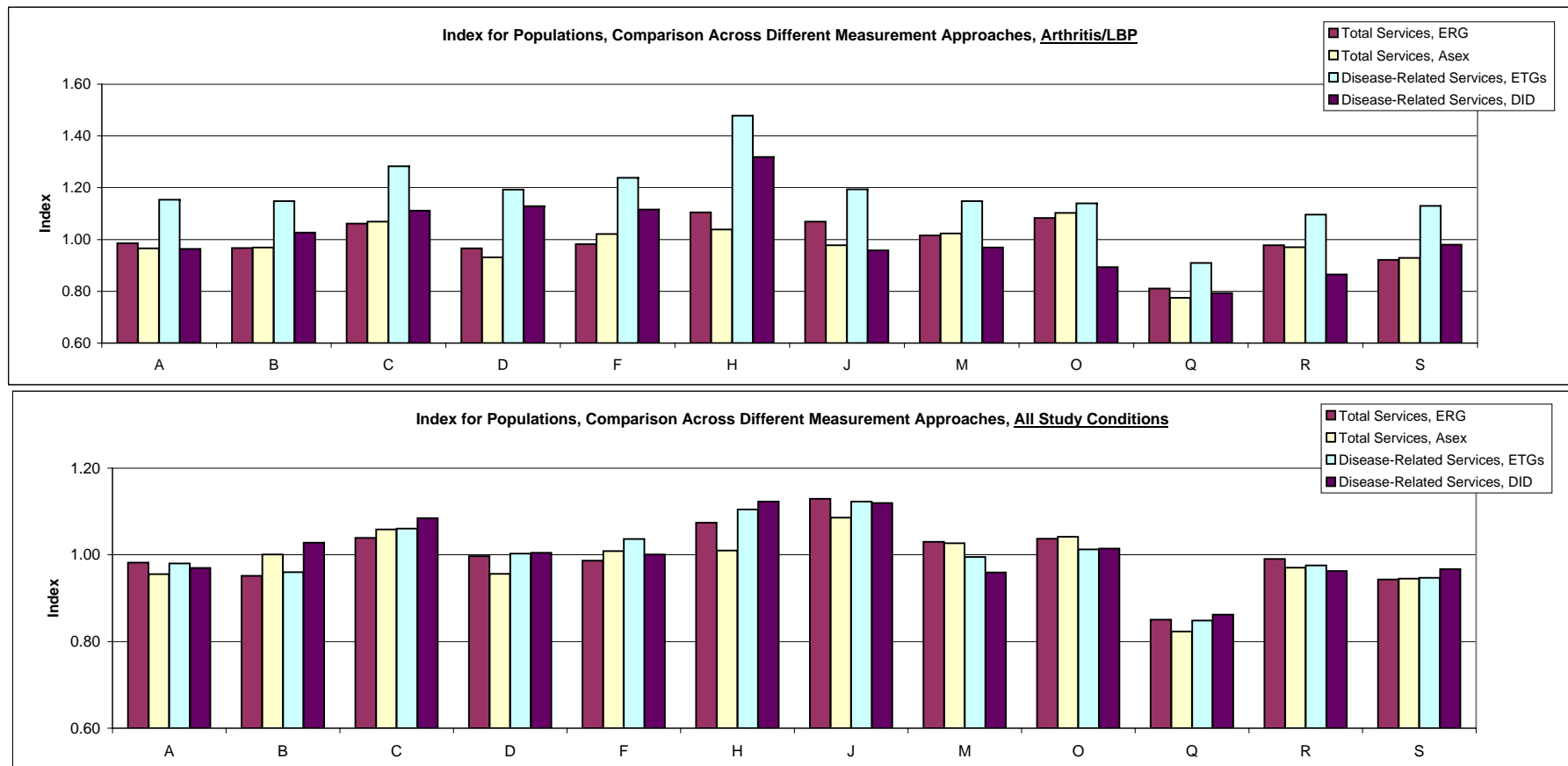
NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results for Presentation, 12/09/04

Table 10: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Major Clinical Category, including All Study Conditions and Diseases



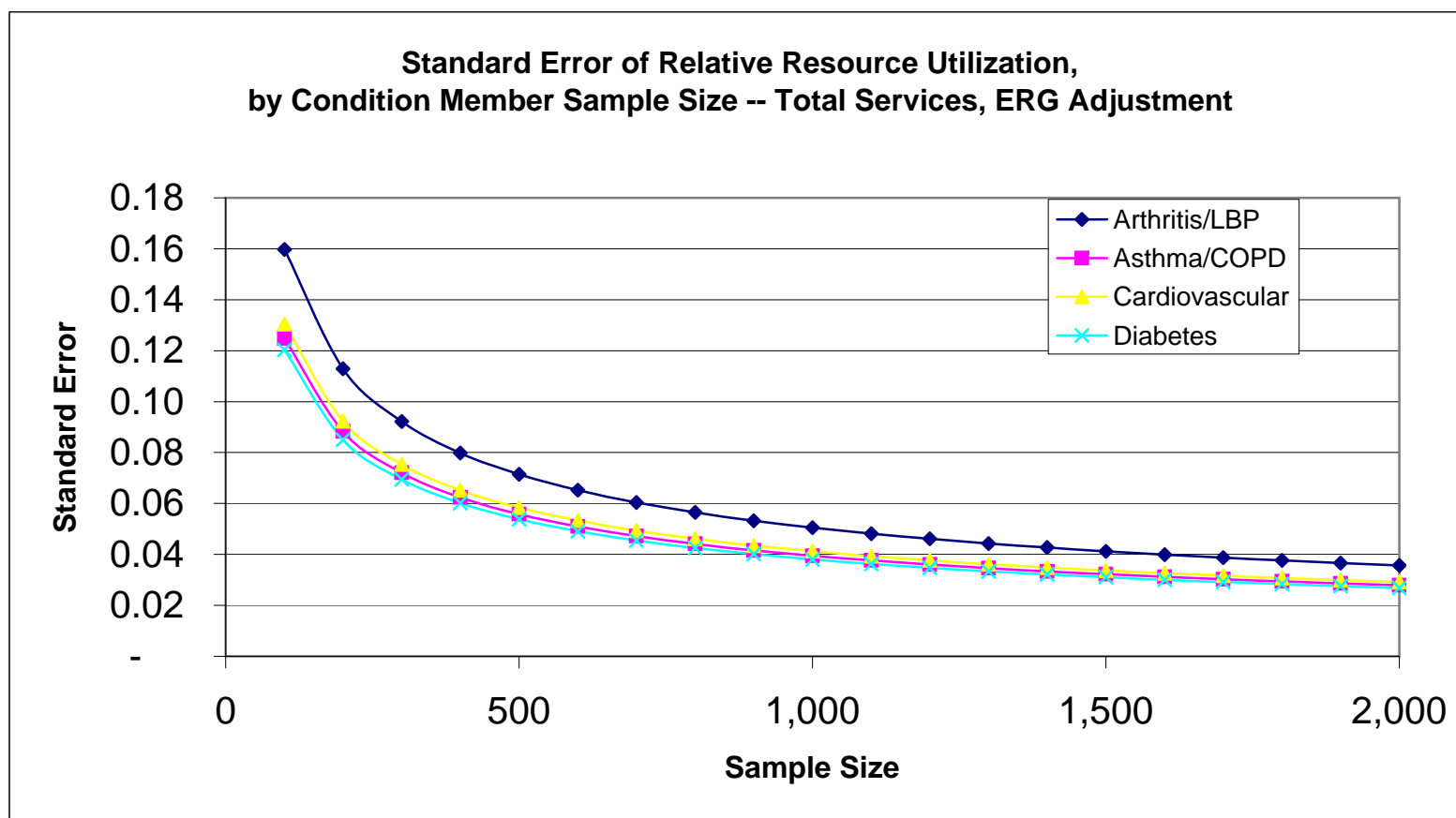
NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results for Presentation, 12/09/04

Table 10: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Major Clinical Category, including All Study Conditions and Diseases



NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 11a: Sample Size and Standard Error, by Clinical Category
Total Costs*, Total Services, ERGs used for Risk Adjustment

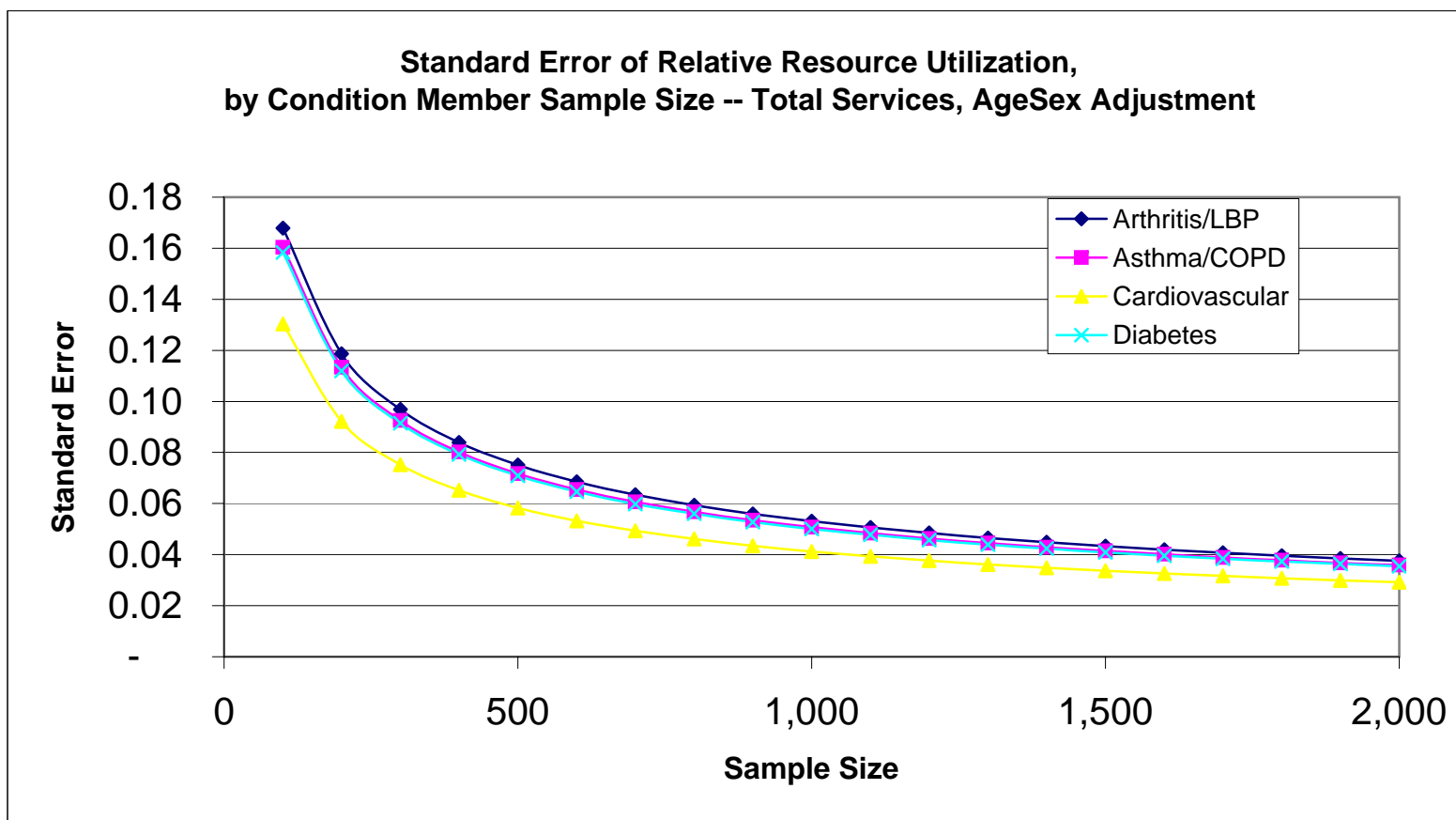


Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology".

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 11b: Sample Size and Standard Error, by Clinical Category
Total Costs*, Total Services, AgeSex used for Morbidity Adjustment

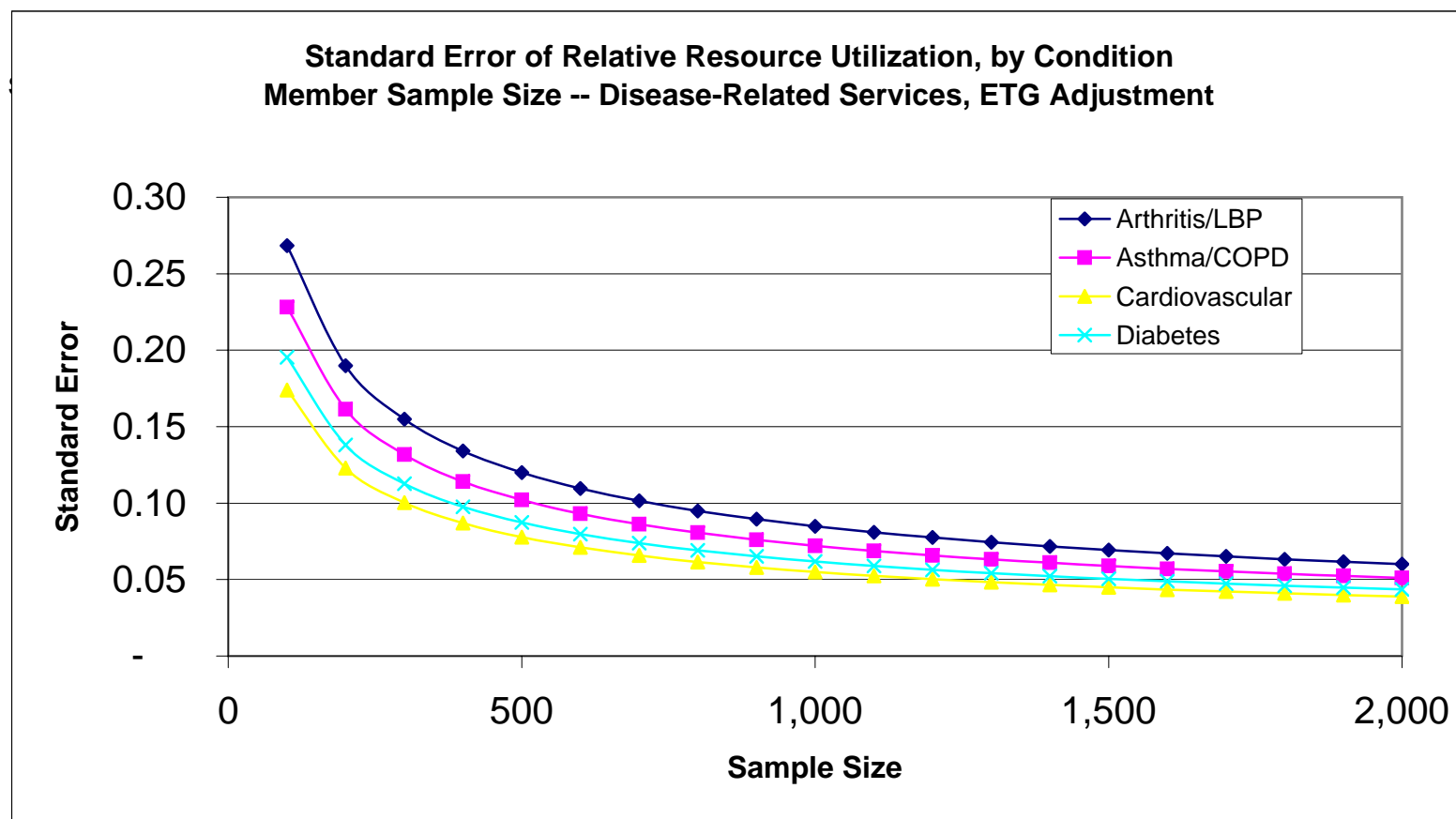


Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology".

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 11c: Sample Size and Standard Error, by Clinical Category
Total Costs*, Disease-Related Services, ETGs

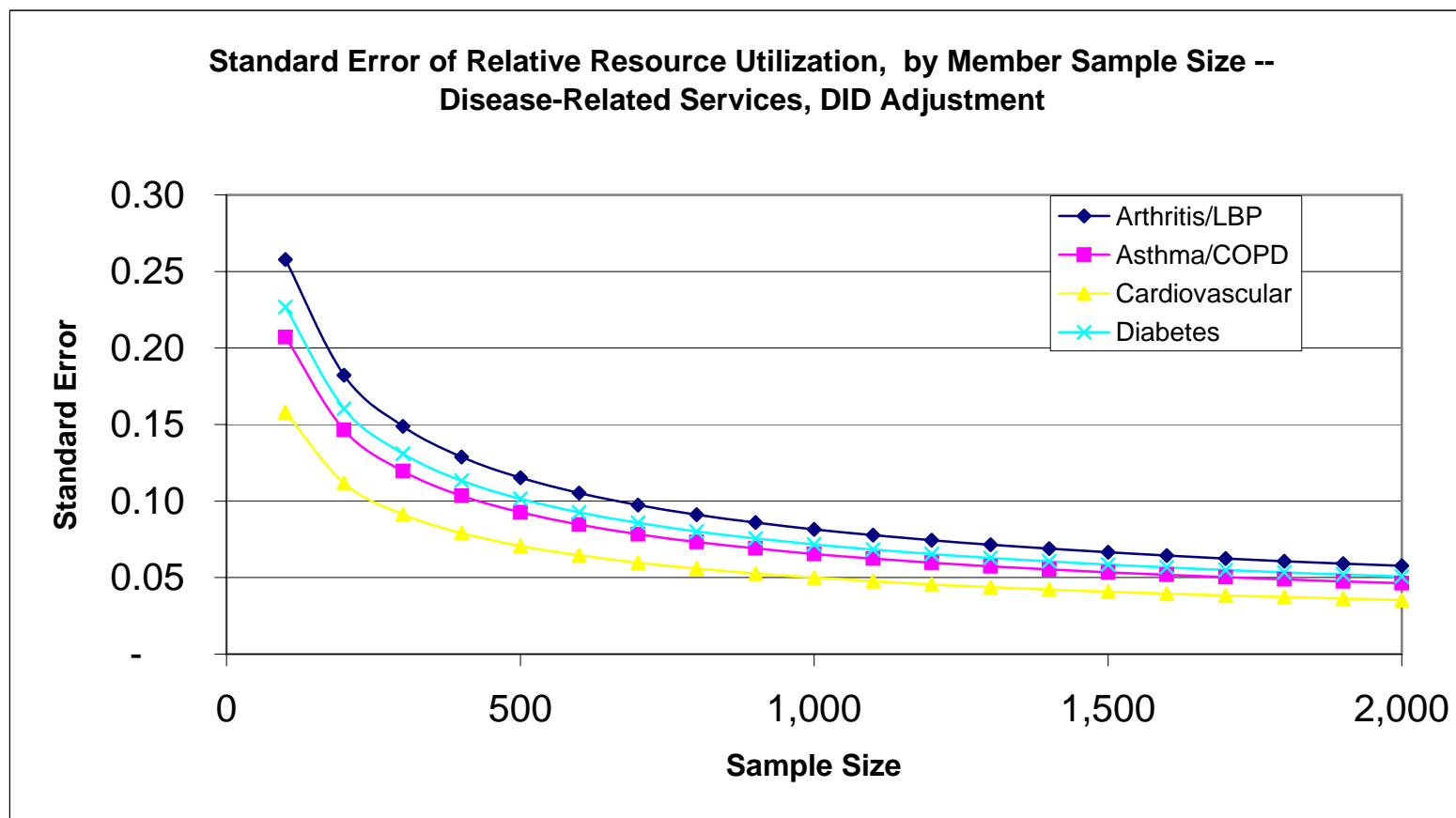


Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology".

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results Table

Table 11d: Sample Size and Standard Error, by Clinical Category
Total Costs*, Disease-Related Services, DID



Index for total services excludes "Diagnostics", "E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology".

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions

Appendix Table

Table A-1: Percent of Patients Identified with a Clinical Grouping also Identified for Another Clinical Grouping (Overlap between Clinical Groupings)

Major Clinical Grouping	Total Patients	Cardiovasc	Asthma/ COPD	Arthritis/ LBP	Diabetes
Cardiovascular	73,371	100%	12%	11%	26%
Asthma/COPD	237,423	4%	100%	6%	5%
Arthritis/LBP	214,157	4%	7%	100%	7%
Diabetes	200,653	9%	6%	8%	100%

-This table shows the percentage of total members identified for a clinical grouping that were also identified for another clinical

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions

Appendix Table

Table A-1a: Percent of Patients Identified with a Clinical Grouping also Identified for Another Clinical Grouping (Includes Multiple Overlap between Clinical Groupings)

Major Clinical Grouping	Number of Patients
Cardiovascular	73,371
Asthma/COPD	237,423
Arthritis/LBP	214,157
Diabetes	200,653

Major Clinical Grouping					% of Members in Major Clinical Category			
Cardiovascular	Asthma/COPD	Arthritis/LBP	Diabetes	# of Patients	Cardiovascular	Asthma/COPD	Arthritis/LBP	Diabetes
No	No	No	Yes	159,301				79%
No	No	Yes	No	180,314			84%	
No	No	Yes	Yes	12,270			6%	6%
No	Yes	No	No	206,143		87%		
No	Yes	No	Yes	8,863		4%		4%
No	Yes	Yes	No	12,518		5%	6%	
No	Yes	Yes	Yes	1,258		1%	1%	1%
Yes	No	No	No	43,412	59%			
Yes	No	No	Yes	14,789	20%			7%
Yes	No	Yes	No	4,814	7%		2%	
Yes	No	Yes	Yes	1,715	2%		1%	1%
Yes	Yes	No	No	5,268	7%	2%		
Yes	Yes	No	Yes	2,105	3%	1%		1%
Yes	Yes	Yes	No	916	1%	0%	0%	
Yes	Yes	Yes	Yes	352	0%	0%	0%	0%

-This table shows the percentage of total members identified for a clinical grouping that were also identified for another clinical Grouping.

For example, 79% of members identified with Diabetes were not identified for another study condition.

As a second example, 7% of the patients identified with Diabetes were also identified with Cardiovascular -- but not Asthma/COPD nor Arthritis/LBP.

-Members identified with a condition in Year 2 with 6 or more member months enrolled during

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

Table A-2: The Impact of Pharmacy Data on Identification--the Number of Patients Identified for a Clinical Grouping Using Only Medical Claims Data as a Percentage of the Number Identified Using both Medical and Pharmacy Claims.

	Patients Identified using Medical Claims as a Percentage of Patients Identified using Medical and Pharmacy Claims						
Clinical Grouping	Medicare Risk	Medicaid	A	B	C	D	F
AMI Year 2							
Angina							
Arthritis							
Asthma	56%	63%	56%	66%	59%	61%	64%
CAD							
CHF							
COPD							
Diabetes Type I	59%	42%	47%	65%	45%	48%	54%
Diabetes Type II	92%	101%	85%	92%	84%	92%	89%
Low Back Pain							

	Patients Identified using Medical Claims as a Percentage of Patients Identified using Medical and Pharmacy Claims						
Clinical Grouping	H	J	M	O	Q	R	S
AMI Year 2							
Angina							
Arthritis							
Asthma	56%	54%	63%	64%	63%	54%	48%
CAD							
CHF							
COPD							
Diabetes Type I	45%	42%	51%	50%	50%	45.9%	42.6%
Diabetes Type II	91%	72%	84%	83%	91%	82.9%	76.1%
Low Back Pain							

-This table shows the number of patients identified for a clinical grouping using medical claims as a percentage of the number of patients identified using medical and pharmacy claims.

Blank denotes Disease where Pharmacy is not part of the Identification Criteria

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

Table A-3a: Total Disease Related Costs PMPM, by Population and Service Category, using Episode Treatment Groups (ETGs) Methodology, Commercial Population

All Commercial Populations		PMPM Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpat.	Lab	Other	Phys Medicine	Procs	RX	Rad.	Total
AMI	4,051	\$10	\$14	\$98	\$68	\$1	\$45	\$1,573	\$23	\$178	\$30	\$140	\$74	\$45	\$2,299
AMI w/Comorbid	1,750	\$13	\$21	\$103	\$96	\$0	\$52	\$1,889	\$25	\$207	\$28	\$159	\$153	\$50	\$2,797
Angina	2,146	\$11	\$5	\$50	\$26	\$0	\$12	\$80	\$10	\$26	\$3	\$8	\$49	\$31	\$310
Angina w/Comorbid	818	\$9	\$8	\$54	\$41	\$0	\$14	\$155	\$15	\$50	\$4	\$20	\$147	\$43	\$561
Arthritis	67,805	\$11	\$4	\$3	\$20	\$0	\$2	\$162	\$6	\$43	\$21	\$42	\$43	\$22	\$381
Asthma	157,768	\$0	\$1	\$4	\$8	\$0	\$4	\$5	\$1	\$4	\$0	\$0	\$40	\$2	\$69
Asthma w/Comorbid	46,204	\$0	\$1	\$5	\$8	\$0	\$4	\$12	\$1	\$6	\$0	\$0	\$50	\$3	\$92
CAD	34,212	\$12	\$5	\$60	\$31	\$0	\$10	\$310	\$13	\$50	\$7	\$37	\$73	\$40	\$647
CAD w/Comorbid	16,571	\$15	\$10	\$71	\$51	\$0	\$15	\$417	\$21	\$81	\$9	\$50	\$174	\$47	\$961
CHF	6,540	\$12	\$12	\$75	\$63	\$0	\$20	\$788	\$19	\$102	\$7	\$51	\$84	\$29	\$1,262
CHF w/Comorbid	7,283	\$15	\$23	\$82	\$114	\$0	\$36	\$1,168	\$28	\$190	\$10	\$64	\$203	\$41	\$1,973
COPD	13,772	\$1	\$2	\$9	\$16	\$0	\$6	\$53	\$2	\$20	\$0	\$1	\$45	\$7	\$163
COPD w/Comorbid	19,679	\$1	\$3	\$9	\$19	\$0	\$7	\$101	\$2	\$22	\$0	\$1	\$50	\$6	\$221
Diabetes I	20,129	\$2	\$3	\$2	\$19	\$0	\$5	\$24	\$10	\$48	\$2	\$7	\$143	\$3	\$268
Diabetes I w/Comorbid	26,082	\$4	\$5	\$5	\$32	\$0	\$8	\$66	\$14	\$45	\$2	\$14	\$178	\$6	\$380
Diabetes II	54,976	\$1	\$1	\$2	\$12	\$0	\$1	\$5	\$7	\$6	\$1	\$2	\$67	\$2	\$108
Diabetes II w/Comorbid	99,466	\$1	\$2	\$3	\$16	\$0	\$2	\$14	\$9	\$10	\$1	\$4	\$89	\$3	\$156
LBP	146,352	\$13	\$4	\$3	\$18	\$0	\$7	\$43	\$3	\$29	\$28	\$25	\$32	\$35	\$239

-This table shows the disease-related costs PMPM for Year 2 for patients identified for each clinical grouping, by service category. Disease-related costs were identified for this table using Symmetry's Episode Treatment Groups (ETGs). To do this, Year 2 medical and pharmacy claims for each member were grouped using ETGs. Specific ETGs determined to be disease-related were mapped to each clinical category. The patient's disease-related ETG experience for each clinical category was then summarized by service category.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

Episode Treatment Groups are proprietary to Symmetry Health Data Systems.

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

Table A-3b: Total Disease Related Costs PMPM, by Population and Service Category, using Disease Identification(DID) Methodology, Commercial Population

All Commercial Populations		PMPM Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpat.	Lab	Other	Phys Medicine	Procs	RX	Rad.	Total
AMI	4,051	\$11	\$11	\$76	\$59	\$1	\$39	\$1,590	\$19	\$136	\$21	\$138	\$103	\$33	\$2,234
AMI w/Comorbid	1,750	\$17	\$18	\$79	\$88	\$0	\$47	\$1,997	\$23	\$169	\$21	\$155	\$170	\$37	\$2,823
Angina	2,146	\$12	\$3	\$34	\$23	\$0	\$9	\$96	\$8	\$21	\$2	\$7	\$68	\$21	\$305
Angina w/Comorbid	818	\$16	\$6	\$42	\$39	\$0	\$15	\$204	\$15	\$48	\$2	\$13	\$157	\$27	\$585
Arthritis	67,805	\$12	\$4	\$2	\$22	\$0	\$3	\$177	\$6	\$40	\$12	\$38	\$53	\$14	\$383
Asthma	157,768	\$2	\$1	\$4	\$10	\$0	\$5	\$17	\$1	\$7	\$0	\$0	\$49	\$1	\$97
Asthma w/Comorbid	46,204	\$3	\$1	\$5	\$12	\$0	\$5	\$39	\$2	\$10	\$0	\$0	\$63	\$2	\$142
CAD	34,212	\$15	\$4	\$45	\$27	\$0	\$8	\$315	\$13	\$41	\$5	\$36	\$108	\$29	\$645
CAD w/Comorbid	16,571	\$21	\$8	\$55	\$48	\$0	\$13	\$474	\$21	\$74	\$7	\$49	\$192	\$35	\$997
CHF	6,540	\$11	\$8	\$44	\$55	\$0	\$18	\$945	\$16	\$75	\$4	\$38	\$96	\$20	\$1,331
CHF w/Comorbid	7,283	\$20	\$18	\$53	\$108	\$0	\$35	\$1,345	\$27	\$172	\$8	\$52	\$193	\$29	\$2,062
COPD	13,772	\$3	\$2	\$9	\$22	\$0	\$9	\$134	\$3	\$28	\$0	\$1	\$48	\$6	\$266
COPD w/Comorbid	19,679	\$4	\$4	\$10	\$32	\$0	\$13	\$392	\$5	\$45	\$1	\$1	\$54	\$6	\$567
Diabetes I	20,129	\$6	\$3	\$2	\$19	\$0	\$6	\$53	\$11	\$50	\$1	\$4	\$87	\$3	\$247
Diabetes I w/Comorbid	26,082	\$13	\$6	\$8	\$38	\$0	\$10	\$202	\$18	\$62	\$2	\$9	\$113	\$7	\$487
Diabetes II	54,976	\$3	\$1	\$2	\$13	\$0	\$2	\$17	\$8	\$9	\$1	\$1	\$49	\$2	\$108
Diabetes II w/Comorbid	99,466	\$6	\$2	\$5	\$21	\$0	\$3	\$66	\$12	\$18	\$1	\$3	\$58	\$3	\$199
LBP	146,352	\$11	\$3	\$2	\$18	\$0	\$8	\$49	\$3	\$24	\$22	\$20	\$35	\$28	\$223

-This table shows the disease-related costs PMPM for Year 2 for patients identified for each clinical grouping, by service category. Disease-related costs were identified for this table using a methodology called the "disease identification" (DID) approach. The DID approach assigns each service to "disease-related" if that service also meets the diagnostic and procedural codes used to identify the patient for that condition. For pharmacy services, additional logic not used for disease identification is also employed. For cardiovascular conditions, services with a hypertension diagnosis were also included as disease related. The patient's disease-related DID experience for each clinical category was then summarized by service category.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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Table A-3c: Disease Related Costs as a Percentage of Total Costs, by Clinical Grouping and Service Category, using ETG Methodology, Commercial Population

All Commercial Populations		Percentage Disease Related Costs of Total Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpatient	Lab	Other	Phys Medicine	Procs	RX	Rad	Total
AMI	4,051	40%	62%	88%	73%	15%	82%	92%	62%	76%	80%	83%	46%	60%	84%
AMI w/Comorbid	1,750	34%	63%	86%	72%	5%	80%	87%	61%	68%	77%	78%	56%	58%	79%
Angina	2,146	32%	38%	72%	50%	1%	55%	55%	38%	33%	30%	21%	37%	48%	45%
Angina w/Comorbid	818	27%	43%	73%	58%	1%	47%	55%	48%	41%	41%	33%	53%	50%	50%
Arthritis	67,805	26%	31%	12%	33%	0%	18%	57%	20%	33%	66%	49%	25%	33%	39%
Asthma	157,768	1%	17%	40%	24%	0%	32%	15%	6%	9%	2%	0%	39%	7%	21%
Asthma w/Comorbid	46,204	1%	10%	17%	15%	0%	19%	8%	4%	6%	1%	0%	20%	6%	11%
CAD	34,212	34%	42%	80%	57%	2%	57%	77%	46%	47%	49%	51%	42%	55%	61%
CAD w/Comorbid	16,571	34%	50%	79%	64%	2%	59%	71%	54%	49%	51%	51%	55%	53%	61%
CHF	6,540	34%	43%	74%	54%	7%	54%	61%	48%	44%	52%	51%	42%	43%	56%
CHF w/Comorbid	7,283	34%	52%	75%	63%	3%	64%	67%	51%	48%	59%	50%	55%	45%	61%
COPD	13,772	3%	19%	33%	30%	1%	34%	26%	12%	18%	2%	3%	30%	13%	22%
COPD w/Comorbid	19,679	1%	12%	15%	18%	0%	21%	14%	7%	11%	2%	1%	18%	8%	13%
Diabetes I	20,129	10%	38%	19%	49%	1%	42%	25%	44%	41%	19%	25%	65%	10%	43%
Diabetes I w/Comorbid	26,082	11%	28%	13%	40%	1%	31%	14%	37%	24%	15%	19%	50%	9%	27%
Diabetes II	54,976	3%	22%	16%	39%	1%	21%	11%	32%	13%	15%	9%	47%	8%	27%
Diabetes II w/Comorbid	99,466	4%	19%	10%	32%	0%	18%	7%	32%	12%	12%	8%	41%	7%	20%
LBP	146,352	39%	38%	18%	38%	1%	33%	36%	13%	34%	80%	48%	27%	47%	37%

This table shows the disease-related costs PMPM as a percentage of total costs (disease-related and other) for Year 2 for patients identified for each clinical grouping, by service category. Disease-related costs were identified for this table using Symmetry's Episode Treatment Groups (ETGs). See also note for Table 7a.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

Episode Treatment Groups are proprietary to Symmetry Health Data Systems.

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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Table A-3d: Disease Related Costs as a Percentage of Total Costs, by Clinical Grouping and Service Category, using Disease Identification (DID) Methodology, Commercial

All Commercial Populations		Percentage Disease Related Costs of Total Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpatient	Lab	Other	Phys Medicine	Procs	RX	Rad	Total
AMI	4,051	42%	48%	68%	63%	12%	71%	93%	53%	58%	55%	82%	64%	45%	82%
AMI w/Comorbid	1,750	47%	53%	66%	66%	5%	73%	92%	57%	55%	58%	76%	62%	44%	80%
Angina	2,146	36%	25%	50%	44%	4%	44%	66%	32%	27%	18%	18%	52%	32%	44%
Angina w/Comorbid	818	48%	33%	57%	54%	1%	50%	72%	48%	39%	21%	21%	57%	31%	53%
Arthritis	67,805	27%	25%	9%	36%	1%	23%	62%	22%	31%	39%	44%	30%	21%	40%
Asthma	157,768	15%	18%	35%	30%	0%	39%	45%	10%	15%	0%	1%	48%	6%	30%
Asthma w/Comorbid	46,204	10%	11%	15%	21%	0%	25%	25%	8%	10%	0%	1%	25%	4%	18%
CAD	34,212	42%	30%	60%	51%	2%	45%	78%	43%	39%	33%	50%	62%	40%	60%
CAD w/Comorbid	16,571	48%	40%	61%	60%	2%	53%	80%	54%	45%	37%	50%	61%	39%	63%
CHF	6,540	34%	31%	44%	47%	7%	50%	73%	39%	33%	34%	37%	48%	29%	59%
CHF w/Comorbid	7,283	45%	42%	49%	60%	2%	62%	77%	49%	43%	47%	40%	53%	32%	63%
COPD	13,772	13%	20%	32%	40%	1%	45%	66%	17%	25%	4%	3%	33%	11%	37%
COPD w/Comorbid	19,679	11%	15%	17%	30%	1%	36%	53%	13%	22%	4%	2%	19%	8%	33%
Diabetes I	20,129	33%	34%	19%	51%	1%	48%	54%	49%	44%	15%	13%	40%	10%	40%
Diabetes I w/Comorbid	26,082	33%	29%	18%	47%	2%	43%	44%	47%	32%	17%	12%	32%	11%	35%
Diabetes II	54,976	19%	20%	16%	41%	1%	28%	40%	37%	18%	11%	6%	34%	6%	27%
Diabetes II w/Comorbid	99,466	21%	20%	15%	42%	1%	29%	35%	43%	20%	10%	6%	26%	8%	26%
LBP	146,352	31%	28%	13%	37%	1%	39%	41%	14%	28%	64%	39%	30%	38%	34%

-This table shows the disease-related costs PMPM as a percentage of total costs (disease-related and other) for Year 2 for patients identified for each clinical grouping, by service category.

Disease-related costs were identified for this table using the Disease Identification (DID) methodology. See also note for Table 7b.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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Table A-3e: Comparison of Disease-Related Costs using Two Alternative Methodologies-ETGs and the DID Approach. The Ratio of Disease-related Costs assigned by DID to Disease-related Costs Assigned by ETGs, by Clinical Grouping and Service Category, Commercial Population

All Commercial Populations		The Ratio of DID Disease-Related Costs to ETG Disease-Related Costs, by Service Category													
Clinical Grouping	Total Patients	Amb. Surg.	Consult	Diagnostic	E & M	E & M (MH)	ER	Inpatient	Lab	Other	Phys Medicine	Procs	RX	Rad	Total
AMI	4,051	1.04	0.78	0.77	0.86	0.82	0.87	1.01	0.86	0.76	0.69	0.98	1.38	0.75	0.97
AMI w/Comorbid	1,750	1.38	0.84	0.77	0.92	0.97	0.91	1.06	0.93	0.81	0.75	0.98	1.11	0.76	1.01
Angina	2,146	1.14	0.68	0.69	0.88	5.49	0.80	1.19	0.86	0.81	0.58	0.85	1.40	0.67	0.98
Angina w/Comorbid	818	1.79	0.77	0.79	0.94	1.07	1.05	1.31	1.00	0.96	0.51	0.65	1.07	0.63	1.04
Arthritis	67,805	1.04	0.82	0.75	1.11	1.89	1.23	1.09	1.10	0.93	0.59	0.90	1.22	0.63	1.01
Asthma	157,768	16.77	1.08	0.88	1.24	1.82	1.24	3.06	1.60	1.63	0.26	2.43	1.24	0.87	1.40
Asthma w/Comorbid	46,204	14.15	1.06	0.93	1.41	3.36	1.30	3.24	1.87	1.64	0.50	2.43	1.24	0.75	1.55
CAD	34,212	1.23	0.71	0.75	0.88	1.05	0.79	1.02	0.93	0.82	0.67	0.98	1.49	0.74	1.00
CAD w/Comorbid	16,571	1.43	0.80	0.77	0.94	1.49	0.89	1.14	1.00	0.91	0.73	0.98	1.10	0.74	1.04
CHF	6,540	0.99	0.72	0.59	0.86	0.94	0.93	1.20	0.81	0.74	0.64	0.73	1.14	0.67	1.05
CHF w/Comorbid	7,283	1.32	0.81	0.65	0.95	0.81	0.98	1.15	0.96	0.91	0.80	0.81	0.95	0.72	1.04
COPD	13,772	4.26	1.07	0.96	1.35	1.64	1.35	2.55	1.43	1.40	1.84	0.98	1.08	0.79	1.63
COPD w/Comorbid	19,679	7.31	1.34	1.13	1.68	2.56	1.70	3.90	1.99	2.08	2.38	1.57	1.09	0.96	2.57
Diabetes I	20,129	3.23	0.90	0.99	1.03	2.03	1.15	2.17	1.12	1.06	0.79	0.53	0.61	0.98	0.92
Diabetes I w/Comorbid	26,082	3.11	1.02	1.45	1.18	1.95	1.36	3.07	1.27	1.37	1.11	0.61	0.64	1.19	1.28
Diabetes II	54,976	6.26	0.91	1.03	1.07	1.58	1.37	3.52	1.15	1.41	0.78	0.67	0.72	0.75	1.00
Diabetes II w/Comorbid	99,466	5.39	1.05	1.50	1.31	2.57	1.58	4.70	1.34	1.69	0.86	0.78	0.65	1.10	1.28
LBP	146,352	0.79	0.74	0.70	0.99	1.45	1.18	1.15	1.11	0.82	0.80	0.80	1.09	0.80	0.93

-This table compares the magnitude of disease-related costs using two alternative approaches Episode Treatment Groups (ETGs) and the Disease Identification (DID) method to assign these costs. The table shows DID assigned disease-related costs as a percentage of ETG assigned disease-related costs. Costs are for Year 2 for patients identified for each clinical grouping, by service category. See also notes for Tables 7a and 7b.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

Table A-4: Assignment of Patients to Morbidity Categories using ERGs-Patients Prevalence by ERG Morbidity Category and Clinical Category, Commercial Population

All Commercial Populations		Percent of Patients, by ERG Morbidity Category							
Clinical Grouping	Total Patients	01	02	03	04	05	06	07	08
AMI	4,051	.	.	6.5%	4.1%	55.6%	21.3%	7.9%	4.5%
AMI w/Comorbid	1,750	.	.	3.0%	4.7%	33.0%	31.7%	15.8%	11.8%
Angina	2,146	7.1%	5.8%	46.6%	31.0%	6.2%	3.3%	.	.
Angina w/Comorbid	818	1.1%	5.9%	28.4%	42.8%	12.8%	9.0%	.	.
Arthritis	67,805	12.9%	25.0%	30.6%	22.4%	5.6%	3.6%	.	.
Asthma	157,768	53.0%	24.1%	15.6%	6.3%	0.8%	0.3%	.	.
Asthma w/Comorbid	46,204	13.3%	27.4%	30.9%	20.9%	4.6%	2.8%	.	.
CAD	34,212	.	.	52.3%	34.8%	7.9%	2.5%	1.5%	0.9%
CAD w/Comorbid	16,571	.	.	24.9%	46.8%	15.5%	5.6%	4.2%	2.9%
CHF	6,540	.	.	21.4%	35.7%	17.8%	8.6%	7.8%	8.7%
CHF w/Comorbid	7,283	.	.	7.4%	27.4%	21.2%	11.6%	13.7%	18.6%
COPD	13,772	.	42.2%	27.3%	21.0%	5.5%	1.8%	2.2%	.
COPD w/Comorbid	19,679	.	15.5%	22.9%	30.3%	13.6%	6.1%	11.7%	.
Diabetes I	20,129	.	42.0%	35.9%	18.0%	2.9%	0.6%	0.6%	.
Diabetes I w/Comorbid	26,082	.	7.3%	31.6%	35.1%	12.2%	5.1%	8.7%	.
Diabetes II	54,976	.	66.2%	21.7%	9.7%	1.7%	0.4%	0.3%	.
Diabetes II w/Comorbid	99,466	.	40.1%	29.3%	20.5%	5.6%	2.1%	2.4%	.
LBP	146,352	30.2%	28.4%	24.1%	13.2%	2.5%	1.6%	.	.

-This table presents the distribution of patients in each clinical category assigned to an ERG Morbidity Category. The ERG Morbidity Categories are used as one approach to risk-adjust total costs for the study. ERGs are an episode-based population health risk assessment tool licensed by Symmetry Health Data Systems. For this analysis, the following ranges of retrospective risk were used to create morbidity categories (category and range of risk shown – a risk score of 1.00 can be considered the average risk of a typical non-elderly commercial population):

01 – risk score less than 1.00	05 – risk score 8.00 to less than 12.00
02 – risk score 1.00 to less than 2.00	06 – risk score 12.00 to less than 15.00
03 – risk score 2.00 to less than 4.00	07 – risk score 15.00 to less than 20.00
04 – risk score 4.00 to less than 8.00	08 – risk score 20.00 or higher

For some clinical categories, morbidity categories at the extremes were collapsed due to low prevalence. Six morbidity groupings were used for each clinical category

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

Table A-4a: Total Costs PMPM for Patients Assigned to Morbidity Categories Assigned using ERGs, Commercial Population.

All Commercial Populations		Average Costs PMPM, by ERG Morbidity Category							
Clinical Grouping	Total Patients	01	02	03	04	05	06	07	08
AMI	4,051	.	.	\$1,834	\$2,680	\$2,379	\$2,993	\$3,756	\$5,584
AMI w/Comorbid	1,750	.	.	\$2,529	\$2,621	\$2,806	\$3,204	\$4,008	\$6,394
Angina	2,146	\$309	\$552	\$482	\$913	\$1,182	\$1,667	.	.
Angina w/Comorbid	818	\$433	\$611	\$732	\$1,115	\$1,544	\$2,052	.	.
Arthritis	67,805	\$328	\$543	\$863	\$1,302	\$1,953	\$3,470	.	.
Asthma	157,768	\$151	\$325	\$547	\$937	\$1,663	\$3,370	.	.
Asthma w/Comorbid	46,204	\$226	\$404	\$721	\$1,206	\$1,894	\$3,556	.	.
CAD	34,212	.	.	\$725	\$1,176	\$1,622	\$2,164	\$2,928	\$5,197
CAD w/Comorbid	16,571	.	.	\$865	\$1,376	\$2,004	\$2,434	\$2,999	\$4,872
CHF	6,540	.	.	\$1,087	\$1,484	\$2,252	\$2,967	\$3,854	\$6,313
CHF w/Comorbid	7,283	.	.	\$1,420	\$1,750	\$2,367	\$3,017	\$4,120	\$6,699
COPD	13,772	.	\$295	\$636	\$1,075	\$1,541	\$2,154	\$3,517	.
COPD w/Comorbid	19,679	.	\$406	\$805	\$1,384	\$2,193	\$2,785	\$4,882	.
Diabetes I	20,129	.	\$284	\$547	\$1,061	\$1,584	\$2,268	\$3,883	.
Diabetes I w/Comorbid	26,082	.	\$361	\$577	\$1,141	\$1,922	\$2,484	\$4,976	.
Diabetes II	54,976	.	\$223	\$521	\$864	\$1,366	\$1,834	\$3,624	.
Diabetes II w/Comorbid	99,466	.	\$297	\$619	\$1,081	\$1,664	\$2,282	\$4,152	.
LBP	146,352	\$210	\$438	\$740	\$1,243	\$2,002	\$3,752	.	.

- This table presents the average total costs PMPM for patients in each clinical category assigned to an ERG Morbidity Category. The ERG Morbidity Categories are used as one approach to risk-adjust total costs for the study. See table 8 for notes on how ERGs were used.
- Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).
- Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.
- Pharmacy data used as part of the patient identification for Asthma, and Diabetes
- Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

Table A-5: Assignment of Patients to Morbidity Categories using Age and Sex Groupings – Patient Prevalence by Age-Sex Category and Clinical Category, Commercial Population.

All Commercial Populations		Percent of Patients, by Age-Sex Morbidity Category						
Clinical Grouping	Total Patients	All, 00-17	Females, 18-44	Males, 18-44	All, 45-54	All, 55-64	All, 65-74	All, 75+
AMI	4,051	0.0%	2.4%	9.2%	32.9%	40.8%	9.2%	5.5%
AMI w/Comorbid	1,750	0.0%	2.1%	5.4%	30.5%	43.1%	12.7%	6.2%
Angina	2,146	0.0%	5.8%	7.5%	27.1%	37.8%	13.5%	8.2%
Angina w/Comorbid	818	0.0%	3.5%	3.9%	23.5%	43.5%	16.5%	9.0%
Arthritis	67,805	0.0%	8.5%	6.6%	28.3%	39.8%	10.9%	6.0%
Asthma	157,768	37.1%	24.0%	15.2%	14.5%	7.7%	1.2%	0.2%
Asthma w/Comorbid	46,204	3.2%	19.1%	9.9%	30.4%	29.7%	6.2%	1.6%
CAD	34,212	0.0%	1.4%	4.3%	22.9%	45.3%	17.0%	9.0%
CAD w/Comorbid	16,571	0.0%	1.2%	2.5%	21.3%	47.3%	19.0%	8.7%
CHF	6,540	0.0%	3.1%	4.6%	18.1%	30.0%	16.3%	27.9%
CHF w/Comorbid	7,283	0.0%	1.3%	2.0%	14.4%	38.3%	22.1%	22.0%
COPD	13,772	7.2%	13.9%	9.9%	23.4%	31.7%	9.4%	4.5%
COPD w/Comorbid	19,679	0.2%	4.1%	2.9%	19.2%	42.6%	18.2%	12.9%
Diabetes I	20,129	0.0%	27.6%	26.7%	24.2%	17.5%	3.3%	0.7%
Diabetes I w/Comorbid	26,082	0.0%	8.7%	8.5%	28.2%	40.2%	10.8%	3.7%
Diabetes II	54,976	0.0%	16.2%	12.5%	31.7%	31.4%	6.6%	1.5%
Diabetes II w/Comorbid	99,466	0.0%	5.7%	6.1%	28.5%	42.9%	12.3%	4.4%
LBP	146,352	0.0%	27.8%	23.0%	27.0%	17.7%	3.2%	1.3%

-This table presents the distribution of patients in each clinical category assigned to an Age-Sex Category. The Age-Sex Morbidity Categories are used as one approach to risk-adjust total costs for the study.

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP). Hierarchies applied for some conditions (see note for Table 2).

"All", indicates both males and females for that age range.

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Table A-5a: Total Costs PMPM for Patients Assigned to Morbidity Categories Assigned using Age-Sex, Commercial Population.

All Commercial Populations		Age-Sex Morbidity Category						
Clinical Grouping	Total Patients	All, 00-17	Females, 18-44	Males, 18-44	All, 45-54	All, 55-64	All, 65-74	All, 75+
AMI	4,051	-	\$2,007	\$2,330	\$2,629	\$2,880	\$3,037	\$2,793
AMI w/Comorbid	1,750	-	\$3,699	\$3,020	\$3,418	\$3,651	\$3,639	\$3,253
Angina	2,146	-	\$797	\$610	\$693	\$679	\$662	\$785
Angina w/Comorbid	818	-	\$1,449	\$959	\$1,236	\$1,057	\$986	\$1,224
Arthritis	67,805	-	\$807	\$692	\$890	\$1,031	\$1,116	\$1,211
Asthma	157,768	\$210	\$413	\$273	\$439	\$491	\$511	\$628
Asthma w/Comorbid	46,204	\$808	\$804	\$583	\$781	\$867	\$924	\$1,193
CAD	34,212	-	\$1,238	\$921	\$1,076	\$1,064	\$1,110	\$1,023
CAD w/Comorbid	16,571	-	\$1,925	\$1,763	\$1,614	\$1,598	\$1,507	\$1,464
CHF	6,540	-	\$2,124	\$2,038	\$2,250	\$2,739	\$2,149	\$1,887
CHF w/Comorbid	7,283	-	\$3,003	\$2,437	\$3,244	\$3,612	\$3,171	\$2,767
COPD	13,772	\$429	\$650	\$559	\$736	\$788	\$850	\$1,076
COPD w/Comorbid	19,679	\$2,638	\$1,403	\$1,416	\$1,559	\$1,697	\$1,821	\$1,904
Diabetes I	20,129	-	\$694	\$430	\$602	\$652	\$674	\$812
Diabetes I w/Comorbid	26,082	-	\$1,200	\$987	\$1,284	\$1,534	\$1,632	\$1,795
Diabetes II	54,976	-	\$451	\$285	\$360	\$404	\$449	\$546
Diabetes II w/Comorbid	99,466	-	\$668	\$525	\$662	\$792	\$940	\$1,157
LBP	146,352	-	\$582	\$431	\$679	\$861	\$1,019	\$1,258

-This table presents the average total costs PMPM for patients in each clinical category assigned to an Age-Sex Morbidity Category. The Age-Sex Morbidity Categories are used as one approach to risk-adjust total costs for the study.

-Costs based on IHCIS Standard Pricing Methodology (consistent methodology and pricing levels applied to all populations and services).

-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year.

-Pharmacy data used as part of the patient identification for Asthma, and Diabetes

-Members can be identified for more than one major clinical grouping (Cardiovascular, Asthma/COPD, Diabetes, and Arthritis/LBP).

Hierarchies applied for some conditions (see note for Table 2).

-A00_17 indicates all genders, and so on.

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Appendix Table

Table A-6a: Correspondence of Relative Resource Utilization Indices Across Types of Service -- Rank-Order Correlations.
Total Patient Costs, ERGs used for Risk Adjustment

Type of Service	Rank Order Correlations for Total Services, ERG Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total
Amb. Surg.	0.71	0.59	0.54	0.84	0.27	0.62	0.29	0.13	0.64	0.65
Consult	0.50	(0.11)	0.56	(0.10)	0.41	(0.16)	0.27	(0.25)	0.55	(0.08)
Diagnostic	0.59	0.73	0.42	0.71	0.50	0.78	0.51	0.73	0.52	0.71
E & M	0.06	(0.21)	0.20	(0.11)	0.24	0.01	(0.11)	(0.20)	0.31	(0.16)
ER	0.55	0.50	0.62	0.48	0.45	0.46	0.57	0.52	0.32	0.39
Inpatient	0.70	0.43	0.89	0.26	0.82	0.38	0.90	0.87	0.56	0.30
Lab	(0.48)	0.34	(0.52)	0.31	(0.50)	0.34	(0.08)	0.55	(0.53)	0.27
Other	0.07	0.62	0.05	0.57	(0.36)	0.34	0.32	0.73	0.26	0.75
Phys Medicine	0.48	0.68	0.19	0.57	0.27	0.51	0.56	0.61	0.36	0.52
Procs	0.38	0.29	0.45	0.38	0.22	(0.07)	0.29	0.43	0.43	(0.01)
RX	0.09	(0.04)	0.04	(0.10)	(0.20)	(0.03)	(0.20)	(0.31)	0.35	0.27
Rad	0.14	0.71	0.06	0.69	(0.14)	0.64	0.49	0.88	0.08	0.64
Total* (selected)	1.00	0.62	1.00	0.51	1.00	0.48	1.00	0.73	1.00	0.55
Total	0.62	1.00	0.51	1.00	0.48	1.00	0.73	1.00	0.55	1.00

- Spearman Rank Order Correlation of Relative Resource Utilization Index for a Type of Service versus Index for Total Services (all services) or Index for Total* (Selected) services -- across commercial populations.

-Selected services include AmbSurg, Consults, E&M, ER, Inpatient, Procs and RX.

- For example, the rank order correlation for the Inpatient Relative Resource Utilization Index with the Index for all services, for All Diseases, is shown in the row labelled "Inpatient" and the section "All Diseases", "Total" column.

- Correlations statistically significant at the 0.05 level are shaded (in yellow in color, and gray in black and white)

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Table A-6b: Correspondence of Relative Resource Utilization Indices Across Types of Service -- Rank-Order Correlations.
Total Patient Costs, Age/Sex used for Risk Adjustment

Type of Service	Rank Order Correlations for Total Services, AgeSex Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total
Amb. Surg.	0.51	0.42	0.65	0.76	0.18	0.49	0.02	(0.14)	0.34	0.52
Consult	0.62	(0.29)	0.53	(0.10)	0.59	(0.18)	0.22	(0.43)	0.79	0.03
Diagnostic	0.41	0.62	0.34	0.69	0.46	0.78	0.41	0.76	0.34	0.74
E & M	0.39	(0.11)	0.29	0.21	0.61	0.21	(0.06)	(0.35)	0.71	0.31
ER	0.48	0.36	0.48	0.38	0.21	0.26	0.45	0.50	0.36	0.48
Inpatient	0.72	0.32	0.78	0.24	0.80	0.29	0.88	0.76	0.68	0.07
Lab	(0.60)	0.43	(0.50)	0.27	(0.33)	0.38	(0.24)	0.50	(0.50)	0.17
Other	(0.08)	0.65	(0.06)	0.51	(0.30)	0.50	0.05	0.63	0.08	0.66
Phys Medicine	0.45	0.73	0.31	0.61	0.31	0.64	0.51	0.71	0.43	0.60
Procs	0.27	0.28	0.59	0.45	0.41	0.22	0.38	0.47	0.41	0.10
RX	0.38	0.05	0.36	0.18	0.33	0.23	(0.08)	(0.22)	0.79	0.56
Rad	0.04	0.73	(0.09)	0.59	(0.10)	0.62	0.24	0.71	0.11	0.70
Total* (selected)	1.00	0.33	1.00	0.57	1.00	0.55	1.00	0.69	1.00	0.48
Total	0.33	1.00	0.57	1.00	0.55	1.00	0.69	1.00	0.48	1.00

- Spearman Rank Order Correlation of Relative Resource Utilization Index for a Type of Service versus Index for Total Services (all services) or Index for Total* (Selected) services -- across commercial populations.

-Selected services include AmbSurg, Consults, E&M, ER, Inpatient, Procs and RX.

- For example, the rank order correlation for the Inpatient Relative Resource Utilization Index with the Index for all services, for All Diseases, is shown in the row labelled "Inpatient" and the section "All Diseases", "Total" column.

- Correlations statistically significant at the 0.05 level are shaded (in yellow in color, and gray in black and white)

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Table A-6c: Correspondence of Relative Resource Utilization Indices Across Types of Service -- Rank-Order Correlations.
Total Patient Disease-Related Costs, using ETG methodology

Type of Service	Rank Order Correlations for Disease-Related Services, ETG Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total
Amb. Surg.	0.52	0.40	0.82	0.71	0.31	0.29	(0.15)	(0.24)	0.43	0.18
Consult	0.35	(0.24)	0.00	(0.29)	0.49	0.13	(0.08)	(0.37)	0.39	(0.13)
Diagnostic	0.68	0.69	0.31	0.33	0.27	0.29	0.66	0.80	0.57	0.68
E & M	0.09	(0.38)	0.22	0.08	0.48	0.17	(0.17)	(0.31)	0.64	(0.01)
ER	0.46	0.31	0.29	0.01	0.29	0.14	0.39	0.48	0.46	0.50
Inpatient	0.77	0.81	0.47	0.20	0.38	0.24	0.95	0.93	0.33	(0.24)
Lab	(0.25)	0.45	0.12	0.45	(0.32)	(0.10)	0.29	0.56	0.10	0.41
Other	0.01	0.54	0.58	0.68	(0.02)	(0.11)	0.30	0.57	0.36	0.69
Phys Medicine	0.55	0.57	0.52	0.64	(0.15)	(0.67)	0.38	0.57	0.21	0.31
Procs	0.45	0.55	0.39	0.52	0.59	0.80	0.66	0.74	0.50	(0.10)
RX	0.42	0.20	0.31	0.42	0.62	0.31	0.01	(0.13)	0.92	0.75
Rad	0.30	0.78	0.59	0.77	(0.06)	0.03	0.74	0.90	0.49	0.41
Total* (selected)	1.00	0.72	1.00	0.87	1.00	0.58	1.00	0.91	1.00	0.60
Total	0.72	1.00	0.87	1.00	0.58	1.00	0.91	1.00	0.60	1.00

- Spearman Rank Order Correlation of Relative Resource Utilization Index for a Type of Service versus Index for Total Services (all services) or Index for Total* (Selected) services -- across commercial populations.

-Selected services include AmbSurg, Consults, E&M, ER, Inpatient, Procs and RX.

- For example, the rank order correlation for the Inpatient Relative Resource Utilization Index with the Index for all services, for All Diseases, is shown in the row labelled "Inpatient" and the section "All Diseases", "Total" column.

- Correlations statistically significant at the 0.05 level are shaded (in yellow in color, and gray in black and white)

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Table A-6d: Correspondence of Relative Resource Utilization Indices Across Types of Service -- Rank-Order Correlations.
Total Patient Disease-Related Costs, using DID methodology

Type of Service	Rank Order Correlations for Disease-Related Services, DID Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total	Total* (selected)	Total
Amb. Surg.	0.62	0.55	0.53	0.69	(0.01)	0.15	0.27	0.13	0.60	0.76
Consult	(0.26)	(0.62)	0.29	(0.20)	(0.12)	(0.52)	(0.42)	(0.67)	0.17	(0.41)
Diagnostic	0.41	0.67	0.41	0.27	(0.10)	0.19	0.54	0.78	0.35	0.73
E & M	(0.19)	(0.61)	0.03	(0.08)	0.08	(0.48)	(0.63)	(0.74)	0.15	(0.24)
ER	0.27	0.41	0.37	0.07	(0.08)	(0.01)	0.27	0.50	0.29	0.59
Inpatient	0.80	0.47	0.82	0.19	0.73	0.64	0.97	0.84	0.61	0.25
Lab	(0.12)	0.44	(0.38)	0.49	0.06	0.40	0.36	0.59	(0.38)	0.27
Other	0.18	0.53	0.31	0.82	0.23	0.33	0.15	0.57	0.29	0.78
Phys Medicine	0.38	0.75	0.13	0.60	(0.06)	(0.13)	0.23	0.50	(0.06)	0.53
Procs	0.14	0.55	0.27	0.62	0.23	(0.10)	0.67	0.77	(0.27)	(0.08)
RX	0.50	0.21	0.31	0.43	0.38	0.36	(0.03)	(0.25)	0.87	0.83
Rad	0.07	0.55	0.17	0.80	0.02	0.34	0.33	0.69	0.06	0.58
Total* (selected)	1.00	0.66	1.00	0.48	1.00	0.70	1.00	0.86	1.00	0.65
Total	0.66	1.00	0.48	1.00	0.70	1.00	0.86	1.00	0.65	1.00

- Spearman Rank Order Correlation of Relative Resource Utilization Index for a Type of Service versus Index for Total Services (all services) or Index for Total* (Selected) services -- across commercial populations.

-Selected services include AmbSurg, Consults, E&M, ER, Inpatient, Procs and RX.

- For example, the rank order correlation for the Inpatient Relative Resource Utilization Index with the Index for all services, for All Diseases, is shown in the row labelled "Inpatient" and the section "All Diseases", "Total" column.

- Correlations statistically significant at the 0.05 level are shaded (in yellow in color, and gray in black and white)

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Table A-7: Correspondence of Relative Resource Utilization Indices Across Methods -- Rank-Order Correlations.
Comparison of Method for Total and Total* Services, Different Risk Adjustment Methods

All Diseases								
ERG Total* (Selected)	ERG Total	Asex Total* (Selected)	Asex Total	ETG Total* (Selected)	ETG Total	DID Total* (Selected)	DID Total	
ERG Total* (Selected)	1.00	0.62	0.87	0.50	0.91	0.52	0.69	0.48
ERG Total		1.00	0.35	0.95	0.78	0.97	0.61	0.94
Asex Total* (Selected)			1.00	0.33	0.83	0.29	0.64	0.27
Asex Total				1.00	0.73	0.97	0.59	0.93
ETG Total* (Selected)					1.00	0.72	0.76	0.66
ETG Total						1.00	0.52	0.94
DID Total* (Selected)							1.00	0.66
DID Total								1.00

Arthritis/LBP								
ERG Total* (Selected)	ERG Total	Asex Total* (Selected)	Asex Total	ETG Total* (Selected)	ETG Total	DID Total* (Selected)	DID Total	
ERG Total* (Selected)	1.00	0.51	0.88	0.59	0.62	0.34	0.78	0.19
ERG Total		1.00	0.36	0.93	0.86	0.85	0.49	0.78
Asex Total* (Selected)			1.00	0.57	0.52	0.32	0.79	0.18
Asex Total				1.00	0.87	0.86	0.69	0.80
ETG Total* (Selected)					1.00	0.87	0.71	0.78
ETG Total						1.00	0.47	0.93
DID Total* (Selected)							1.00	0.48
DID Total								1.00

Asthma/COPD								
ERG Total* (Selected)	ERG Total	Asex Total* (Selected)	Asex Total	ETG Total* (Selected)	ETG Total	DID Total* (Selected)	DID Total	
ERG Total* (Selected)	1.00	0.48	0.83	0.50	0.57	0.52	0.57	0.52
ERG Total		1.00	0.26	0.80	0.07	0.57	0.09	0.67
Asex Total* (Selected)			1.00	0.55	0.66	0.54	0.60	0.45
Asex Total				1.00	0.36	0.64	0.38	0.74
ETG Total* (Selected)					1.00	0.58	0.57	0.38
ETG Total						1.00	0.22	0.50
DID Total* (Selected)							1.00	0.70
DID Total								1.00

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Table A-7: Correspondence of Relative Resource Utilization Indices Across Methods -- Rank-Order Correlations.
Comparison of Method for Total and Total* Services, Different Risk Adjustment Methods

Method

ERG Total* (Selected)	ERG Total	Asex Total* (Selected)	Asex Total	ETG Total* (Selected)	ETG Total	DID Total* (Selected)	DID Total
ERG Total* (Selected)	1.00	0.73	0.94	0.73	0.87	0.69	0.73
ERG Total		1.00	0.61	0.94	0.88	0.97	0.84
Asex Total* (Selected)			1.00	0.69	0.85	0.62	0.73
Asex Total				1.00	0.92	0.97	0.87
ETG Total* (Selected)					1.00	0.91	0.94
ETG Total						1.00	0.87
DID Total* (Selected)							1.00
DID Total							

Method

ERG Total* (Selected)	ERG Total	Asex Total* (Selected)	Asex Total	ETG Total* (Selected)	ETG Total	DID Total* (Selected)	DID Total
ERG Total* (Selected)	1.00	0.55	0.65	0.57	0.38	0.48	0.54
ERG Total		1.00	0.16	0.89	0.24	0.87	0.23
Asex Total* (Selected)			1.00	0.48	0.80	0.38	0.93
Asex Total				1.00	0.62	0.91	0.56
ETG Total* (Selected)					1.00	0.60	0.91
ETG Total						1.00	0.49
DID Total* (Selected)							1.00
DID Total							

- Spearman Rank Order Correlation of Relative Resource Utilization Index for a Method for Total Services (all services) or Index for Total* (Selected) services versus Index for another Method -- across commercial populations.

'-Selected services include AmbSurg, Consults, E&M, ER, Inpatient, Procs and RX.

- For example, the rank order correlation for the ERG Risk Adjustment Method, Total* (Selected) Services Index with the Index for the same services using the Asex Method, for All Diseases, is shown in the "All Diseases" Table, row labelled "ERG Total* (Selected)" and the "Asex Total* (Selected)" column.

- Correlations statistically significant at the 0.05 level are shaded (in yellow in color, and gray in black and white)