NATIONAL QUALITY FORUM

Resource Use Measure Evaluation 1.0
January 2011

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

Resource Use Definition:

- Resource use measures are broadly applicable and comparable measures of input counts—(in terms of units or dollars)-- applied to a population or population sample
- Resource use measures count the frequency of specific resources; these resource units may be monetized, as appropriate.
- The approach to monetizing resource use varies and often depends on the perspective of the measurer and those being measured. Monetizing resource use allows for the aggregation across resources.

NQF Staff: NQF staff will complete a preliminary review of the measure to ensure conditions are met and the form has been completed according to the developer's intent. Staff comments have been highlighted in green.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the subcriteria are met (TAP or Steering Committee)
High (H) – based on the information submitted, there is high confidence (or certainty) that the criterion is met
Moderate (M) – based on the information submitted, there is moderate confidence (or certainty) that the criterion is met
Low (L) - based on the information submitted, there is low confidence (or certainty) that the criterion is met
Insufficient (I) – there is insufficient information submitted to evaluate whether the criterion is met, e.g., blank, incomplete, or information is not relevant, responsive, or specific to the particular question (unacceptable)
Not Applicable (NA) - Not applicable (only an option for a few subcriteria as indicated)

Evaluation ratings of whether the measure met the overall criterion (Steering Committee)
Yes (Y)- The overall criteria has been met
No (N)-The overall criterion has NOT been met
High (H) – There is high confidence (or certainty) that the criterion is met
Moderate (M) – There is moderate confidence (or certainty) that the criterion is met
Low (L) - There is low confidence (or certainty) that the criterion is met

Recommendations for endorsement (Steering Committee)
Yes (Y) – The measure should be recommended for endorsement
No (N)-The measure should NOT be recommended for endorsement
Abstain (A)- Abstain from voting to recommend the measure

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
Staff Reviewer Name(s):	
NQF Review #: 1557	**NQF Project:** Endorsing Resource Use Standards- Phase II

BRIEF MEASURE INFORMATION
Measure Title: Relative Resource Use for People with Diabetes (RDI)
Measure Steward (IP Owner): National Committee for Quality Assurance (NCQA), 1100 13th Street NW, STE 1000, Washington, District Of Columbia, 20005
Brief description of measure: The risk-adjusted relative resource use by health plan members 18-75 years of age who were identified as having diabetes (type 1 and type 2) during the measurement year.
Resource use service categories: Inpatient services: Inpatient facility services Inpatient services: Evaluation and management Inpatient services: Procedures and surgeries Inpatient services: Imaging and diagnostic Inpatient services: Lab services Inpatient services: Admissions/discharges Ambulatory services: Outpatient facility services Ambulatory services: Emergency Department Ambulatory services: Pharmacy Ambulatory services: Evaluation and management Ambulatory services: Procedures and surgeries Ambulatory services: Imaging and diagnostic Ambulatory services: Lab services
Brief description of measure clinical logic: This measure addresses the resource use of members identified with diabetes (Type I and Type II). Diagnosis of the disease or use of anti-diabetic medications are used to identify members for inclusion in the eligible population and the results are adjusted to account for age, gender, and HCC-RRU risk classifications that predict cost variability (Refer to Attachment S8_Clinical Logic for additional information).
If included in a composite or paired with another measure, please identify composite or paired measure:
Subject/ Topic Areas: Endocrine
Type of resource use measure: Cost/Resource Use
Data Type: Administrative claims Electronic Clinical Data Electronic Clinical Data : Electronic Health Record Electronic Clinical Data : Imaging/Diagnostic Study Electronic Clinical Data : Laboratory Electronic Clinical Data : Pharmacy Electronic Clinical Data : Registry Paper Records

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. Measure Steward Agreement. ***The measure is in the public domain or an intellectual property (measure steward agreement) is signed. Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.***	**A** **Y☐** **N☐**

A.1.Do you attest that the measure steward holds intellectual property rights to the measure? (If no, do not submit) Yes **A.2. Please check if either of the following apply:** Proprietary measure **A.3. Measure Steward Agreement.** Agreement signed and submitted **A.4. Measure Steward Agreement attached:**	
B. Maintenance. ***The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. (If no, do not submit)*** Yes, information provided in contact section	**B** **Y☐** **N☐**
C. Purpose/ Use *(All the purposes and/or uses for which the measure is specified and tested:* Professional Certification or Recognition Program Public Reporting Quality Improvement with Benchmarking (external benchmarking to multiple organizations) Regulatory and Accreditation Programs	**C** **Y☐** **N☐**
D. Testing. ***The measure is fully specified and tested for reliability and validity (See guidance on measure testing).*** Yes, reliability and validity testing completed	**D** **Y☐** **N☐**
E. Harmonization and Competing Measures. ***Have NQF-endorsed measures been reviewed to identify if there are related or competing measures? (List the NQF # and title in the section on related and competing measures)*** Yes ***E.1.*Do you attest that measure harmonization issues with related measure (either the same measure focus or the same target population) have been considered and addresses as appropriate? (List the NQF # and title in the section on related and competing measures)** Yes *E.2.Do you attest that competing measures (both the same measure focus and the same target population) have been considered and addressed where appropriate?* Yes	**E** **Y☐** **N☐**
F. Submission Complete. ***The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.***	**F** **Y☐** **N☐**
Have all conditions for consideration been met? **Staff Notes to Steward** (*if submission returned*)**:**	**Y ☐** **N ☐**

Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**
File Attachments Related to Measure/Criteria: Attachment: Attachment: Attachment: Attachment: Attachment: Attachment: S8_Clinical Logic_RDI.pdf Attachment: Attachment: Attachment: S12_Sample Score Report_RDI.pdf Attachment: SA_Reliability_Validity Testing.pdf

IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in performance. **Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All subcriteria must be met to pass this criterion.**	**Eval Rating**
High Impact **IM1. Demonstrated high impact aspect of healthcare:** Affects large numbers A leading cause of morbidity/mortality High resource use Patient/societal consequences of poor quality Severity of illness **IM1.1. Summary of evidence of high impact:** Diabetes is a global epidemic that has created a crisis for the health care system. Data from the National Health and Nutrition Examination Survey (NHANES) indicated that as of 2002, 19.3 million, or 9.3 percent of the adult population ages 20 years and older in the United States, had diabetes (Cowie, 2006). Of the 19.3 million, one-third did not receive an initial diagnosis of diabetes. Diagnostic efforts have improved over the years, with the prevalence of diabetes diagnoses increasing from 5.1% (time frame: 1988-1994) to 6.5% (1999 to 2002) (Cowie, 2006). However, diabetes continues to be the sixth leading cause of death (CDC, 2005). Risk for premature death among individuals with diabetes is about twice that for those without the diagnosis. Adults with diabetes have higher rates of stroke and death from heart disease in comparison to adults without diabetes, being 2 to 4 times more at risk for these events. Additionally, poor management of diabetes contributes to serious morbidities. Diabetes is the leading cause of new cases of blindness among adults aged 20 to 74 years and the leading cause of end-stage renal disease (ESRD), accounting for 44% of new cases. Diabetes is also the primary cause of over 60% of lower-limb amputations that are not attributed to trauma (CDC, 2005). Financially, in 2007, excess medical expenditures attributed to diabetes totaled $116 billion and $58 billion in productivity costs (ADA, 2008). People with diabetes account for significantly higher use of health care resources (e.g., inpatient hospital care, outpatient and physician office visits, emergency visits, nursing facility stays, home health visits, prescription drug and medical supplies) when compared to people without diabetes. In addition, people with diabetes are at an increased risk of comorbidities and other complications, which also account for the high cost and resource utilization (ADA, 2008).	**1a** **H☐** **M☐** **L☐** **I☐**

Recent studies highlight the prevalence and economic burden associated with diabetes by type and the stage of progression of the disease (ADA, 2008; Dall, 2009; Zhang, 2009; Chen, 2009). Nearly 17.5 million people living in the United States were diagnosed with type 1 or type 2 diabetes mellitus in 2007, costing an estimated $174.4 billion in medical costs and lost productivity (ADA, 2008). For patients with type 2 diabetes (approximately 16.5 million), the annual national cost is $159.5 billion; and for patients with type 1 diabetes (approximately 1.0 million people), the cost is $14.9 billion (Dall, 2009). Currently, the annual direct and indirect costs associated with all of these conditions are approximately $218 billion (Timothy, 2010).

In 2007, another 6.3 million adults in the United States who were undiagnosed suffered from associated costs estimated at $18 billion (inclusive of direct and indirect costs) (Zhang, 2009). In addition, nearly 57 million adults have pre-diabetes, which is associated with $25 billion annually in higher medical costs (Zhang, 2009). Diabetes for specific populations is also expensive. This figure highlights the significance of the economic burden of diabetes with respect to spending on other national priorities.

IM1.2. Citations for evidence of high impact cited in IM1.1.:

American Diabetes Association. Economic costs of diabetes in the U.S. in 2007. Diabetes Care. 2008;31 (3):576–615.

Centers for Disease Control and Prevention. National Diabetes Fact Sheet: General Information and National Estimates on Diabetes in the United States, 2005. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005.

Chen Y, Quick WW, Yang W, Zhang Y, Baldwin A, Moran J, et al. Cost of gestational diabetes mellitus in the United States in 2007. Popul Health Manag. 2009;12(3):165–74.

Cowie CC, Rust KF, Byrd-Holt DD, Eberhardt MS, Flegal KM, Engelgau MM, et al. Prevalence of diabetes and impaired fasting glucose in adults in the U.S. population: National Health and Nutrition Examination Survey 1999- 2002. Diabetes Care. 2006;29:1263-8. [PMID: 16732006]

Dall TM, Mann SE, Zhang Y, Quick WW, Seifert RF, Martin J, et al. Distinguishing the economic costs associated with type 1 and type 2 diabetes. Popul Health Manag. 2009;12(2):103–10.

Timothy M., Yiduo Zhang, Yaozhu J., William W., et al. The economic burden of diabetes. Health Affairs. 2010; 29 (2).

Zhang Y, Dall TM, Mann SE, Chen Y, Martin J, Moore V, et al. The economic costs of undiagnosed diabetes. Popul Health Manag. 2009;12 (2):95–101.

IM2. Opportunity for Improvement

IM2.1. Briefly explain the benefits envisioned by use of this measure:

The development and implementation of the RRU measurement set, when considered alongside relevant HEDIS quality of-care measures, advances us further down the path to obtaining information that supports value-based purchasing. For the first time, purchasers have a more complete picture of relative health plan value-performance. They can evaluate plans' relative quality and resource use, in comparison to other plans available to the employer, for a number of major chronic illnesses, in addition to specific premiums offered by the plans.
In terms of their overall role in defining cost and utilization, RRU measures provide an aggregate level of measurement within specific high-cost conditions but are reported nationally and within regions, overall and by service type (e.g., inpatient and outpatient E&M services) and across age/gender cohorts. This allows for identification of specific areas on which to focus improvement efforts. These measures are an important first step towards value-based purchasing.

1b

IM2.2. Summary of data demonstrating variation across providers or entities:

Annual analysis of RRU data collected by NCQA over the last four years demonstrates substantial variation in health plan resource use from an overall perspective and with respect to specific service areas (e.g., procedure and surgery services or pharmacy services) and regions. Moreover, a substantial number of health plans can be identified as statistically significantly better or worse than average along RRU and quality dimensions.

H☐ M☐ L☐ I☐

IM2.3. Citations for data on variation:

National Committee for Quality Assurance (NCQA) HEDIS® 2010 Relative Resource Use (RRU)Annual Analytic Report.

IM2.4. Summary of data on disparities by population group:

Data from the Centers for Disease Control and Prevention (CDC) show a dramatic increase in the prevalence of diabetes mellitus in the United States, particularly among certain ethnic populations. For example, the mortality rates for African-Americans and Hispanics with diabetes is nearly twice that of Caucasians (Cowie, 2006). Nearly 50% of both Hispanic and African-American children born between 1900 and 1950 are more likely to develop diabetes if adequate preventive measures are not implemented (Tuomilehto, 2001). Furthermore, non–Hispanic African-American individuals and Mexican-American individuals are respectively 1.8 and 1.7 times more likely to have diabetes when compared to non–Hispanic white individuals. Sufficient data are not yet available to calculate more precise estimates of the total prevalence of diabetes (both diagnosed and undiagnosed) for Hispanic and Latino populations. Additionally, American Indian and Alaska Native individuals are 2.2 times more likely to have diabetes than non–Hispanic white individuals. Meanwhile, individuals of Asian, Native Hawaiian, and other Pacific Islander ancestry who are 20 years or older are more than twice as likely as non–Hispanic white individuals to be diagnosed with diabetes (CDC, 2005).

A considerable number of studies have proved that the presence of diabetes increases the risk of coronary heart disease (CHD), particularly the correlated mortality rates among diagnosed women (Lee, 2000; Hu, 2003). It has also been suggested that women with diabetes have a similar risk of CVD events with women with CVD as a primary diagnosis (Becker, 2003). Women with diabetes also have a greater risk of CHD mortality than women with prior incidents of myocardial infarction (Hu, 2005). However, men who have a primary diagnosis of CVD or have experienced a previous myocardial infarction event conferred a higher risk than diabetes. In addition, over the past 30 years, women with diabetes have not experienced the decline in CHD-related mortality in comparison to men with diabetes and both men and women without diabetes (Pantelis, 2006). In particular, data from the National Health and Nutrition Examination Survey (NHANES) showed that CHD mortality in women with diabetes has increased 23% over the past three decades, compared with a 13.1% decrease in diabetic men and decreases of 27% and 36.4% in women and men without diabetes (Gu, 1999).

IM2.5. Citations for data on disparities cited in IM2.4:

Becker A, Bos G, de VF, et al.: Cardiovascular events in type 2 diabetes: comparison with nondiabetic individuals without and with prior cardiovascular disease. 10-year follow-up of the Hoorn Study. Eur Heart J 2003, 24:1406–1413.

Cowie CC, Rust KF, Byrd-Holt DD, Eberhardt MS, Flegal KM, Engelgau MM, et al. Prevalence of diabetes and impaired fasting glucose in adults in the U.S. population: National Health and Nutrition Examination Survey 1999- 2002. Diabetes Care. 2006;29:1263-8. [PMID: 16732006]

Hu G: Gender difference in all-cause and cardiovascular mortality related to hyperglycaemia and newly-diagnosed diabetes. The DECODE Study Group. Diabetologia 2003, 46:608–617.

Hu G, Jousilahti P, Qiao Q, et al.: The gender-specific impact of diabetes and myocardial infarction at baseline and during follow-up on mortality from all causes and coronary heart disease. J Am Coll Cardiol 2005, 45:1413–1418.

Lee WL, Cheung AM, Cape D, Zinman B: Impact of diabetes on coronary artery disease in women and men: a meta-analysis of prospective studies. Diabetes Care 2000, 23:962–968.

National Diabetes Fact Sheet: United States 2005. Centers for Disease Control and Prevention Web site. Available at: www.ndep.nih.gov/diabetes/pubs/2005_National_Diabetes_Fact_Sheet.pdf. Accessed August 1, 2006. (LOE 1)

Pantelis A. Sarafidis, MD, PhD, Samy I. McFarlane, MD, MPH, and George L. Bakris, MD. Gender Disparity in Outcomes of Care and Management for Diabetes and the Metabolic Syndrome. Current Diabetes Reports 2006, 6:219-224

Tuomilehto J, Lindstrom J, Eriksson JG, et al. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. N Engl J Med. 2001;344(18):1343–1350.

IM3. Measure Intent	**1c**

IM3.1. Describe intent of the measure and its components/ Rationale (including any citations) for analyzing variation in resource use in this way When health plans select providers, negotiate price, design benefits or implement incentives, they use interventions to influence quality and moderate cost. When plans and other stakeholders can compare results with other health plans using the RRU measurement set based on national and regional benchmarks, they have a growing body of information with which to gauge their performance in categories such as clinical quality, patient experience and resource use-cost. Purchasers and plans can independently and collectively review and select appropriate, targeted interventions. RRU measures indicate how a plan uses a set of key resources (e.g., physician visits, hospital stays) to care for its members with specific diseases, compared with the average for plans in the same region and adjusted for the set of diseases and case mix of plan members. RRU results make it possible to simultaneously evaluate both the quality of services and key elements that drive costs and premiums. In the interest of transparency, NCQA has issued quality reports on individual measures and in aggregate ratings of quality—for example, in the State of Health Care Report and America's Best Health Plans—that make it possible to compare plan performance with market averages. NCQA created additional disease-specific composites for use with the RRU measures. By reviewing a health plan's RRU and quality ratios together, purchasers and plans can engage in a balanced, data-driven dialogue about benefit design or the effectiveness of a wellness program or disease management program. Plan performance information can be supplemented with a detailed analysis of internal data by self-insured employers or by plans studying expenditures. These individual plan or purchaser data can provide a detailed look at specific criteria (e.g., age and disease, procedure-specific admissions).	**H☐ M☐ L☐ I☐**
IM4. Resource use service categories are consistent with measure construct *Refer to IM3.1. & all S9 items to evaluate this criteria.*	**1d** **H☐ M☐ L☐ I☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report*?	
Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, met? **Rationale:**	**Y☐ N☐**

SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented.

MEASURE SPECIFICATIONS

S1. Measure Web Page: ***Do you have a web page where current detailed measure specifications can be obtained?*** No	**Eval Rating 2a1/2b1**
S2. General Approach ***If applicable, summarize the general approach or methodology to the measure specification. This is most relevant to measures that are part of or rely on the execution of a measure system or applies to multiple measures.*** Relative Resource Use (RRU) measures are a standardized way to measure relative resource use related to different types of health care services. When evaluated in conjunction with corresponding quality of care measures, they provide important information related to the efficiency or value of health care services. RRU measures have the following	

features:

- Focus on high-cost conditions for which there are corresponding HEDIS Effectiveness of Care measures
- Segment the effect of unit price and utilization variation
- Rely on an indirect standardization approach to risk adjustment that was developed from regression analysis

RRU measures report the organization's total resource use for defined diseases by service category and use standardized price to relate service units for each eligible member, during each measure's treatment period. The organization does not report prices based on its contracts and fee schedules; rather it applies a standard price to each service, multiplies it by the number of units of service and reports the resulting standard cost. For RRU measures that relate to chronic conditions (e.g., Relative Resource Use for People With Diabetes), the treatment period is the 12-month measurement year. As contrasted with episode grouper based measures, relative resource use is calculated for included services, whether or not they relate directly (as defined by some algorithm or episode grouper) to the specific chronic condition.

Attachment:

S3. Type of resource use measure:

Per capita (population- or patient-based)

S4. Target Population:

S4.1. Subject/Topic Areas:

Endocrine

S4.2. Cross Cutting Areas *(HHS or NPP National health goal/priority)*

Population Health

S5. Data dictionary or code table
Please provide a web page URL or attachment if exceeds 2 pages. NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less.

Data Dictionary:

URL:
Please supply the username and password:
Attachment:

Code Table:

URL: http://www.ncqa.org/downloads/rru/9C9848A9-59EE-4E8D-B092-2350FA74EA35
Please supply the username and password:
Attachment:

S6.Data Protocol (Resource Use Measure Module 1)
The measure developer must determine which of the following data protocol steps: data preparation, data inclusion criteria, data exclusion criteria, and missing data, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

Data Protocol Supplemental Attachment or URL:
If needed, attach document that supplements information provided for data protocol for analysis, data inclusion criteria, data exclusion criteria, and missing data (Save file as: S6_Data Protocol). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including

any references to page numbers, tables, text, etc.

URL:
Please supply the username and password:
Attachment:

S6.1. Data preparation for analysis
Detail (specify) the data preparation steps and provide rationale for this methodology.

Specifications : Organizations must identify the eligible population from transactional or other administrative databases. The organization reports results based on all members who meet the eligible population criteria and who are found through administrative data to have received the services required for the measure. The following data must be available in these databases in order to be included in the data set for the RDI measure:
-demographic enrollment data (i.e. age, gender)
-complete data on any clinical diagnoses and encounters for the two year period of interest
-required medical benefit information for the entire timeframe

S6.2.Data inclusion criteria
Detail initial data inclusion criteria and rationale(related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : To identify the eligible population, include all services whether or not the organization paid for, or expects to pay for, the services (i.e., include denied claims). For cost and frequency reporting, report all services the organization paid for or expects to pay for (i.e., claims incurred but not paid yet). Do not include any denied service or day. If a member is enrolled retroactively, count all services for which the organization paid or expects to pay. Organizations and providers that use proprietary codes, Level II or state-specific Level III HCPCS codes must map to the industry standard code and remove codes that are not included in the NCQA Standard Pricing Tables.
The reporting organization has several options when determining payment for claims: a) Cover the full amount, b) Pay only a portion of the fee (e.g., 80 percent). c) Not pay anything because the member must cover the entire amount to meet a deductible, d) Not pay anything because the service is covered as part of a PMPM payment, e) Deny the service.

Count the service if:
1) The organization pays the full amount or a portion of the amount (e.g., 80 percent)
2) The member paid for the cost of a service that is part of their benefit offering (e.g., to meet a deductible), or
3) The service was covered under a PMPM payment.

Do not count the service if:
1) The organization denied the service for any reason unless the member paid for the cost of a service that is part of the benefit offering (e.g., to meet a deductible)
2) The claim for the service was rejected because it was missing information or was invalid for some other reason.

S6.3. Data exclusion criteria
Detail initial data exclusion criteria and rationale (related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : Denied services or days are not included in either the cost or frequency categories of the RRU measurement calculations. Reporting organizations are not to count services if:
- •The organization denied the service for any reason, unless the member paid for the cost of a service that is part of the benefit offering (e.g., to meet a deductible)
- •The claim for the service was rejected because it was missing information or was invalid for another reason.

S6.4. Missing Data
Detail steps associated with missing data and rationale(e.g., any statistical techniques used)

We do not provide measure specifications or guidelines for missing data : NCQA requires reportable observed data in order to calculate RRU results. All measures must have a final, audited result submitted to NCQA. All plans that do not have any blanked-out utilization numbers are included in the calculation of the raw observed-to-expected ratio. When normalizing the ratios to develop an index, if any raw ratio = 0 (zero), or a plan has submitted a

$0.00 cost for its given member months, that ratio is discarded.

S7. Data Type: Administrative claims
Electronic Clinical Data
Electronic Clinical Data : Electronic Health Record
Electronic Clinical Data : Imaging/Diagnostic Study
Electronic Clinical Data : Laboratory
Electronic Clinical Data : Pharmacy
Electronic Clinical Data : Registry
Paper Records

S7.1. Data Source or Collection Instrument
Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc.)

NCQA collects HEDIS RRU data directly from Health Plan Organizations and Preferred Provider Organizations via a data submission portal - the Interactive Data Submission System (IDSS).). RRU measures use NCQA's standardized prices and NCQA collects data with only the standardized prices applied. The list below summarizes the standard pricing tables (and table names) which organizations use to apply to each service captured for reporting RRU. Consistent standard prices protect the organization's proprietary fee schedules and contracts and support measure comparison across organizations and across regions without requiring adjustment for levels of service payment

HEDIS 2011 STANDARD PRICING TABLES: Volume 2: Technical Specifications
1.Description of codes and services included in the standard price and supporting tables (RRU Reference Table)
2.Cost Cap Amounts (SPT-CAP Amounts)

Inpatient Facility Tables
1.Length of Stay Group (LOS Group)
2.Standard price for inpatient facility services using DRGs (SPT-INP-DRG)
3.Standard price for inpatient facility services using ADSC (SPT-INP-ADSC)
4.Inpatient ICD-9-CM Diagnosis mapping to ADSC (ADSC-Table)
5.Codes indicating major surgery (Maj-Surg-Table)

E&M Table
1.Standard price for evaluation and management (SPT-EM Inpatient and Outpatient)

Surgery and Procedure Table
1.Standard price for surgery and procedures (SPT-Surg-Proc Inpatient and Outpatient)

Diagnostic Lab and Imaging Table
1.Standard price for diagnostic laboratory services (SPT-LAB)
2.Standard price for diagnostic imaging services (SPT-IMG)

Pharmacy Tables
1.Standard price for pharmacy services (SPT-Pharm)
2.Standard price for RLB measure-specific pharmacy services (SPT-Pharm for RLB)

Risk Adjustment Tables
1. CC comorbid category assignments (Table CC-Comorbid
2.CC ranking assignments (Table HCC-Rank)
3.CC combination assignments (Table HCC-Comb)
4.Age/gender HCC weighting (Table RRU-age/gender HCC)
5.Predefined risk weight (Table RRU-Weight)

S7.2. Data Source or Collection Instrument Reference
(Please provide a web page URL or attachment). NQF strongly prefers URLs. Attach documents only if

they are not available on a web page and keep attached file to 5MB or less)

URL: http://www.ncqa.org/tabid/370/Default.aspx
Please supply the username and password:
Attachment:

S8.Measure Clinical Logic (Resource Use Measure Module 2)
The measure's clinical logic includes the steps that identify the condition or event of interest and any clustering of diagnoses or procedures. For example, the diagnoses and procedures that qualifies for a cardiac heart failure episode, including any disease interaction, comorbid conditions, or hierarchical structure to the clinical logic of the model. (Some of the steps listed separately below may be embedded in the risk adjustment description, if so, please indicate NA and in the rationale space list 'see risk adjustment details.')

Clinical Logic Supplemental Attachment or URL:
If needed, provide a URL or document that supplements information provided for the clinical framework, co-morbid interactions, clinical hierarchies, clinical severity levels, and concurrency of clinical events

URL:
Please supply the username and password:
Attachment: S8_Clinical Logic_RDI.pdf

S8.1. Brief Description of Clinical Framework
Briefly describe your clinical logic approach including clinical topic area, whether or not you account for comorbid and interactions, clinical hierarchies, clinical severity levels and concurrency of clinical events.

This measure addresses the resource use of members identified with diabetes (Type I and Type II). Diagnosis of the disease or use of anti-diabetic medications are used to identify members for inclusion in the eligible population and the results are adjusted to account for age, gender, and HCC-RRU risk classifications that predict cost variability (Refer to Attachment S8_Clinical Logic for additional information).

S8.2. Clinical framework

Detail any clustering and the assignment of codes, including the grouping methodology, the assignment algorithm, and relevant codes and rationale for these methodologies.

There are two ways used to identify members with diabetes: by pharmacy data and by claim/ encounter data. An organization must use both methods to identify the eligible population, but a member only needs to be identified by one method to be included in the measure. Members may be identified as having diabetes during the measurement year or the year prior to the measurement year.
Related Pharmacy data: A member that was dispensed insulin or oral hypoglycemics/antihyper-glycemics during the measurement year or the year prior to the measurement year, on an ambulatory basis (Table CDC-A) is included in the measure.
Table CDC-A: Prescriptions to Identify Members With Diabetes
Alpha-glucosidase inhibitors: acarbose; miglitol
Amylin analogs: pramlinitide
Antidiabetic combinations: glimepiride-pioglitazone; glimepiride-rosiglitazone; glipizide-metformin; glyburide-metformin; metformin-pioglitazone; metformin-rosiglitazone; metformin-sitagliptin;

Insulin: insulin aspart; insulin aspart-insulin aspart protamine; insulin detemir; insulin glargine; insulin glulisine; insulin inhalation; insulin isophane beef-pork; insulin isophane human; insulin isophane pork; insulin isophane-insulin regular; insulin lispro; insulin lispro-insulin lispro protamine; insulin regular beef-pork; insulin regular human; insulin regular pork; insulin zinc beef-pork; insulin zinc extended human; insulin zinc human; insulin zinc pork
Meglitinides: nateglinide; repaglinide

Eval Rating 2a1

H☐ M☐ L☐ I☐

Eval Rating 2b1

H☐ M☐ L☐ I☐

Miscellaneous antidiabetic agents: exenatide; sitagliptin

Sulfonylureas: acetohexamide; chlorpropamide; glimepiride; glipizide; glyburide; tolazamide; tolbutamide

Thiazolidinediones: pioglitazone; rosiglitazone
Note: Glucophage/metformin is not included because it is used to treat conditions other than diabetes; members with diabetes on these medications are identified through diagnosis codes only. NCQA will post a complete list of medications and NDC codes to http://www.ncqa.org/tabid/1090/Default.aspx by November 15, 2010.

Using related claim/encounter data: Any members who had two face-to-face encounters in an outpatient setting or nonacute inpatient setting, or one face-to-face encounter in an acute inpatient or ED setting, with any diagnosis of diabetes (Table CDC-B), on different dates of service during the measurement year or the year prior to the measurement year is included in the measure. An organization may count services that occur over both years. Table CDC-C lists the codes to identify appropriate visit type.

Table CDC-B: Codes to Identify Diabetes
ICD-9-CM Diagnosis: 250, 357.2, 362.0, 366.41, 648.0

Table CDC-C: Codes to Identify Visit Type
Outpatient:
CPT: 92002, 92004, 92012, 92014, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99384-99387, 99394-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456
UB Revenue: 051x, 0520-0523, 0526-0529, 057x-059x, , 082x-085x, 088x, 0982, 0983
Nonacute inpatient
CPT: 99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337
UB Revenue: 0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient
CPT: 99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99291
UB Revenue: 010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x,021x, 072x, 080x, 0987
ED
CPT: 99281-99285
UB Revenue: 045x, 0981

Members with one or more of the following dominant clinical conditions during the measurement year must be excluded from all RRU measures.
1) Active cancer. Exclude members who had at least one face-to-face encounter, in any setting, with any diagnosis of cancer in conjunction with any treatment code (Table RRU-A), during the measurement year.
Table RRU-A: Codes to Identify Active Cancer Treatment
ICD-9 diagnosis for cancer: 140-209, 230-239
WITH treatment
CPT: 38230, 38240-38242, 77261-77799, 79005-79999, 96401-96549
ICD-9 Procedure: 00.10, 00.15, 41.0, 41.91, 92.2, 99.25, 99.28, 99.85
UB Revenue: 028x, 033x, 0342, 0344, 0973

2) ESRD. Exclude members who had at least one face-to-face encounter, in any setting, with any code to identify ESRD (Table RRU-B), during the measurement year.
Table RRU-B: Codes to Identify ESRD
CPT: 36145, 36147, 36800-36821, 36831-36833, 90919-90921, 90923-90925, 90935, 90937, 90940, 90945, 90947, 90957-90962, 90965, 90966, 90969, 90970, 90989, 90993, 90997, 90999, 99512
HCPCS: G0257, G0311-G0319, G0321-G0323, G0325-G0327, G0392, G0393, S9339
ICD-9 Diagnosis: 585.5, 585.6, V42.0, V45.1, V56
ICD-9 PCD: 38.95, 39.27, 39.42, 39.43, 39.53, 39.93, 39.94, 39.95, 54.98
UB Revenue: 080x, 082x-085x, 088x
UB Type of Bill: 72x
POS: 65

3) Organ transplant. Exclude members who had at least one face-to-face encounter, in any setting, with any code to identify organ transplant (Table RRU-C), during the measurement year.

Table RRU-C: Codes to Identify Organ Transplant
CPT: 32850-32856, 33930-33945, 44132-44137, 44715-44721, 47133-47147, 48160, 48550-48556, 50300-50380
HCPCS: S2152, S2053-S2055, S2060, S2061, S2065
ICD-9 PCD: 33.5, 33.6, 37.5, 41.94, 46.97, 50.5, 52.8, 55.6
UB Revenue: 0362, 0367, 0810-0813, 0819

4) HIV/AIDS. Members who had at least two face-to-face encounters in an outpatient or nonacute inpatient setting, or at least one face-to-face encounter in an acute inpatient or ED setting, with any diagnosis of HIV (Table RRU-D), with different dates of service during the measurement year. Refer to Table RRU-E for codes to identify visit type.
Table RRU-D: Codes to Identify HIV
ICD-9 Diagnosis: 042
Table RRU-E: Codes to Identify Visit Type
Outpatient
CPT: 92002, 92004, 92012, 92014, 98925-98929, 98940-98942, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99381-99387, 99391-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456
UB Revenue: 051x, 0520 -0523, 0526-0529, 057x-059x, 082x-085x, 088x, 0982, 0983
Nonacute inpatient
CPT: 99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337
UB Revenue: 0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient:
CPT: 99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99291
UB Revenue: 010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x,021x, 072x, 080x, 0987
ED:
CPT: 99281-99285

5) Members with any diagnosis of polycystic ovaries who did not have any face-to-face encounters, in any setting, with any diagnosis of diabetes during the measurement year or the year prior to the measurement year. Diagnosis may occur at any time in the member's history, but must have occurred by December 31 of the measurement year. Refer to Table CDC-B for codes to identify any diagnosis of diabetes; refer to Table CDC-O for codes to identify any diagnosis of polycystic ovaries.
Table CDC-O: Codes to Identify Exclusions [Polycystic ovaries]
ICD-9 Diagnosis:256.4

6) Members with gestational or steroid-induced diabetes who did not have any face-to-face encounters, in any setting, with any diagnosis of diabetes during the measurement year or year prior to the measurement year. Diagnosis may occur during the measurement year or the year prior to the measurement year, but must have occurred by December 31 of the measurement year. Refer to Table CDC-B for codes to identify any diagnosis of diabetes; refer to Table CDC-O for codes to identify gestational and steroid-induced diabetes.
Table CDC-O: Codes to Identify Exclusions
Polycystic ovaries
ICD-9 Diagnosis:256.4
Steroid induced
ICD-9 Diagnosis: 249, 251.8, 962.0
Gestational diabetes
ICD-9 Diagnosis: 648.8

S8.3. Comorbid and interactions
Detail the treatment of co-morbidities & disease interactions and provide rationale for this methodology.

NCQA utilizes a risk adjustment model based on components of the CMS-HCC risk adjustment methodology that accounts for variable risk classifications due to comorbidities and other disease interactions. For each condition,

members are assigned to a clinical cohort category that provides a more specific classification of the condition and has been shown to be a predictor of healthcare costs. For example, a member with Type 1 or Type 2 diabetes is assigned to one of 64 HCC-RRU risk categories based on diagnosis codes that are identified in claims for each member in the prior year. A members age, gender, and HCC-RRU category all determine their risk score (cohort). Refer to section S10.1 for a more complete description of the steps for risk adjustment that account for comorbidities and other disease interactions.

S8.4. Clinical hierarchies
Detail the hierarchy for codes or condition groups used and provide rationale for this methodology.

The RRU-HCC risk adjustment divides qualified service diagnoses into 184 condition categories which are then subjected to hierarchy logic assigning each a ranking group and an HCC group using tables provided by NCQA. The approach captures the combined effect of multiple unrelated conditions, however some diseases (e.g. diabetes, vascular disease) have multiple HCCs to differentiate disease severity and identify rankings (hierarchy) so that a patient's highest ranked HCC for a given disease will cancel out lower ranked HCCs for the same disease. See Section S10.1 for the specific steps required to assign HCCs and rankings. Patients are assigned to a demographic cohort, each of which has its own HCC-RRU. A weight is then calculated for each identified HCC for the patient and summed to provide a summarized total risk score which is then assigned to a predetermined risk cohort for reporting.

S8.5. Clinical severity levels
Detail the method used for assigning severity level and provide rationale for this methodology.

The methodology for calculating risk via HCC and the mapping of that estimated risk to HCC-RRU risk categories accounts for clinical severity as well as other interactions that have been shown to be a significant predictor of health care costs. Refer to section S10.1 for a more complete description of the steps for risk adjustment that account for comorbidities and other disease interactions.

S8.6. Concurrency of clinical events (that may lead to a distinct measure)
Detail the method used for identifying concurrent clinical events, how to manage them, and provide the rationale for this methodology.

We do not provide specifications for concurrency of clinical events.
The NCQA RRU measurement approach accounts for all health plan members who meet the disease specific criteria. All events or encounters for the predefined population that occur during the measurement year are captured by the measure cost or frequency of services categories.

S9. Measure Construction Logic (Resource Use Measure Module 3)
The measure's construction logic includes steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic. For example, any temporal or spatial (i.e., setting of care) parameters used to determine if a particular diagnosis or event qualifies for the measure of interest.

Construction Logic Supplemental Attachment or URL:
If needed, attach <u>supplemental</u> documentation (Save file as: S9_Construction Logic). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.)

URL:
Please supply the username and password:
Attachment:

S9.1. Brief Description of Construction Logic
Briefly describe the measure's construction logic.

The measure reports total standard costs and frequency for all included services for which the organization has paid or expects to pay for the eligible population during a pre-specified measurement year. The eligible population for RDI

includes all health plan members with Type I or Type II diabetes that were continuously enrolled for a two year period (the measurement year and the year prior). Total standard costs are assigned to each service the member received during the measurement year by matching codes for services rendered to codes listed in the NCQA Standardized Price Tables (SPTs) (http://www.ncqa.org/downloads/rru/9C9848A9-59EE-4E8D-B092-2350FA74EA35).
Standard costs are calculated and reported for the following service categories:

- Inpatient Facility
- E&M (inpatient and outpatient service categories)
- Laboratory Services
- Surgery and Procedure (inpatient and outpatient service categories)
- Imaging Services
- Pharmacy

Service frequency counts are reported for all services for which the organization
has paid or expects to pay for the eligible population during the treatment period. Organizations capture each eligible member's services rendered during the treatment period for the following utilization categories.
1.Total Inpatient Facility: Discharges
2.Acute Inpatient: Discharges, Days, ALOS
3.Acute Medicine: Discharges, Days, ALOS
4.Acute Surgery: Discharges, Days, ALOS
5.Nonacute: Discharges, Days, ALOS
6.ED Discharges
7.Pharmacy Utilization

- Name brand only (N1)
- Name brand—Generic exists (N2)
- Generic only (G1)
- Generic name—Name brand exists (G2):

8.Cardiac Catheterization
9.PCI
10.CABG
11.Carotid Endarterectomy
12.Carotid Artery Stenosis Diagnostic Test
13.Cardiac Computed Tomography
14.CAD Diagnostic Test Using EBCT/Nuclear Imaging Stress Test

S9.2. Construction Logic
Detail logic steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic.

An organization counts all services listed in the SPTs rendered to members in the eligible population during the measurement year. The unit prices are calculated to represent data derived from a single source, using a single approach for classifying and pricing services. Pricing algorithms represent average service pricing levels for organizations for the most recent period. Standard prices support consistent comparisons of "weighted utilization" across all members, organizations and geographic areas and protect individual proprietary pricing and fee schedules.
First the eligible population is defined using the clinical and eligibility criteria outlined in Section S8.2 and below:
-18–75 years of age as of December 31 of the measurement year.
-They must be continuously enrolled throughout the measurement year.
-They may not have more than one gap in enrollment (of up to 45 days) anytime during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
-They must have medical benefits for the measurement year

Exclusion criteria are then applied to the eligible population as detailed in Section S8.2. Member months are then calculated for each measure's eligible population after all exclusion criteria has been applied to the eligible population data set using the following steps:
Step 1: Determine member months using a prespecified day (e.g., the 15th or the last day of the month), determined according to the organization's administrative processes. The day selected must be consistent from month to month and year to year. For example, if the organization tallies membership on the 15th of the month and Ms. X is enrolled in the organization on January 15, Ms. X contributes one member month in January. Organizations may count any month in

which members were enrolled retrospectively and the organization received a retroactive capitation payment.

Step 2: Use the member's age on the last day of the treatment period to determine the age group where member months will be counted.

Step 3: Attribute all member months to the product line in which the member is enrolled on the last day of the treatment period.
Note: Pharmacy member months are the number of months during the treatment period when the member is covered by a pharmacy benefit. Calculate pharmacy member months with the same method described in steps 1–3.

In order to calculate outpatient procedures and services, organizations count the number of specified services the organization paid for, or expects to pay for, during the treatment period. The organization is responsible for reporting all services under the member's age and product on the last day of the treatment period.

In order to calculate inpatient services, organizations break down the member services into services for pricing and services for frequency: 1) in services for standard pricing, each organization identifies all inpatient stays that occurred during the treatment period, even if the inpatient admission was prior to the treatment period or the inpatient discharge was after the end of the treatment period. Include all services billed for any inpatient facility, E&M; surgery and procedure, and pharmacy service. Include multiple billings that have the same date of service in the patient record. 2) To determine frequency of services, each organization identifies all inpatient utilization and reports by discharge date (rather than admission date) using the member's age and product on the last day of the treatment period. Include all discharges that occurred during the treatment period. For inpatient discharges, ED visits and condition-specific frequencies, count discharges, not the frequency of procedure codes billed. Transfers between institutions are treated as separate admissions especially when the transfer is between acute and nonacute levels of service or between mental health/chemical dependency services and non-mental health/chemical dependency services. Only one admission is counted when the transfer takes place within the same service category but to a different level of care.
When calculating inpatient services length of stay, organizations should use the following formula to report length of stay (LOS).
LOS = discharge date – admit date – denied days
LOS includes all paid days from admission up to discharge except the last day of the stay unless the admission and discharge date are the same. For inpatient stays that start before the treatment period and end during the treatment period, or that start during the treatment period and end after the treatment period, count all paid days during the inpatient stay, even if they occur outside of the treatment period. When an inpatient revenue code (i.e., UB Revenue code or equivalent) is associated with a stay, the LOS must equal at least one day. If the discharge date and the admission date are the same, the discharge date minus admission date equals 1 day, not 0 days. If the inpatient stay falls completely within the treatment period, the total number of paid days is used as the per diem multiplier. If the inpatient stay does not fall completely inside the treatment period, or all days are not paid for or expected to be paid for, only the days within the treatment period (including the last day in the treatment period) that are paid for or expected to be paid for, are counted to compute the per diem multiplier.

Step 4-Calculate total cost: Sum the total standard cost for each eligible member. Within each service category, if a member's standard cost exceeds the service category cap amount, report the total standard cost specified in the NCQA Cost Cap Amounts table (released with the SPTs).
Sum and report the total standard cost for the eligible population in each service category by member cohort.
Service frequency counts are reported for all services for which the organization has paid or expects to pay for the eligible population during the treatment period. Organizations capture each eligible member's services rendered during the treatment period for the following utilization categories.

- Total Inpatient Facility: Discharges, Days and ALOS
- Acute Inpatient: Discharges, Days, ALOS
- Acute Medicine: Discharges, Days, ALOS
- Acute Surgery: Discharges, Days, ALOS
- Nonacute: Discharges, Days, ALOS
- ED Visits

Step 5: For each of the RRU reporting services categories, if a member's standard cost exceeds the set cap amount (http://www.ncqa.org/tabid/1275/Default.aspx) only the total standard cost including the truncated amount taken from the NCQA Member Cost Cap Amounts table is reported. Members are not excluded from the data set when the capped amount is reached.

Service Category	Cap Amount
Inpatient Facility	$75,000
E&M – Outpatient	$2,500
E&M – Inpatient	$2,500
Surgery – Outpatient	$7,500
Surgery – Inpatient	$15,000
Pharmacy	$15,000

S9.3. Measure Trigger and End mechanisms
Detail the measure's trigger and end mechanisms and provide rationale for this methodology.

The measure captures total annual resource use measured from January 1st to December 31st of the measurement year.

S9.4.Measure redundancy or overlap
Detail how redundancy and overlap of measures can be addressed and provide rationale for this methodology.

We do not provide specifications for measure redundancy or overlap.
The NCQA RRU measurement approach accounts for all health plan members who meet the disease specific criteria. All events or encounters for the predefined population that occur during the measurement year are captured by the measure cost or frequency of services categories.

S9.5.Complementary services
Detail how complementary services have been linked to the measure and provide rationale for this methodology.

We do not provide specifications for linking complementary services.
The NCQA RRU measurement approach accounts for all health plan members who meet the disease specific criteria. All events or encounters for the predefined population that occur during the measurement year are collected separately across all service categories, and standard costs and service frequencies are aggregated across services and members to compute the overall resource use for that member for that year. Including all events for a member, whether or not it can be attributed to a specific chronic condition captures a true snapshot of the resources required to treat a health plan member with a chronic condition.

S9.6.Resource Use Service Categories

Inpatient services: Inpatient facility services
Inpatient services: Evaluation and management
Inpatient services: Procedures and surgeries
Inpatient services: Imaging and diagnostic
Inpatient services: Lab services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department
Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

S9.7.Identification of Resource Use Service Categories
For each of the resource use service categories selected above, provide the rationale for their selection and detail the method or algorithms to identify resource units, including codes, logic and definitions.

Standard Costs are reported for the following categories:

Inpatient facility: this category reports standard prices for inpatient facility services assigned to each stay and based on the standard per diem price. Organizations use the length of stay and ICD-9-CM Diagnosis codes to assign the appropriate standard price.

E&M: Standard prices for E&M services use a resource-based, relative value scale (RBRVS) that establishes consistent prices across a wide range of professional services, including those performed by different specialists and other professionals. Additionally, inpatient E&M services are summarized and collected separately from outpatient services.

Surgery and Procedures: Standard prices for surgery and procedure services (professional component) use a resource-based, relative value scale (RBRVS) that establishes consistent prices across a wide range of professional services, including those performed by different specialists and other professionals. Additionally, inpatient surgery and procedure services are summarized and collected separately from outpatient services.

Diagnostic Lab and Imaging: Standard prices for imaging and laboratory services (professional and technical components) use an approach that establishes consistent prices across a wide range of services, including those performed by facilities, specialists and other professionals. An RBRVS is the primary source of data for these prices.

Pharmacy: Standard prices for ambulatory prescriptions are based on an index of average wholesale prices for drugs of interest. The standard price is listed per metric quantity for each NDC code. Organizations that do not capture the metric quantity for a prescription can use the standard price per days supply for an NDC. Both the standard price per metric quantity and the standard price per days supply are included in the SPT provided on the NCQA Web site (www.ncqa.org).

Service Frequency is reported for the following categories:
Inpatient Facility: This category measures the number of acute and nonacute inpatient facility discharges, days and ALOS regardless of diagnosis. Count each discharge once. Include data from any institution that provides acute or long-term/specialty nonacute care.
If days from the stay are counted in the cost calculation, the stay should also be counted in the inpatient frequency calculation. For nonacute discharges, days and ALOS, include care from any institution that provides nonacute care in hospice, nursing homes, rehabilitation, SNFs, transitional care and respite.

ED Visits: This category measures use of ED services. Count each visit to an ED during the treatment period that does not result in an inpatient stay, regardless of the intensity of care required during the stay or the length of stay. Count only one ED visit per date of service. Do not count visits to urgent care centers.
Refer to Table AMB-B for codes to identify ED visits. Services for members admitted to the hospital from an ED visit are included in the Inpatient Facility category only.
Table AMB-B: Codes to Identify ED Visits
CPT: 99281-99285
UB Revenue: 045x, 0981
Or
CPT: 10040-69979 WITH POS: 23

Pharmacy Utilization: Use Table SPT-Pharm (http://www.ncqa.org/tabid/1277/Default.aspx) to identify the prescription categories for each drug dispensed in the treatment period. Sum and report the number of prescriptions in each of the four categories in the Pharmacy—Total Service Frequency by Prescription Category table.

Additional service frequency categories are part of RDI that are subject to risk adjustment along with the standard cost components of the RRU measures. This allows health plans to more accurately compare their utilization rates to those of their peers as well as to national and regional benchmarks. Health plans can also drill down and trend this information by condition or reporting cohort (e.g., age, gender and HCC-RRU Risk cohort) to determine if there are areas for clinical quality improvement. Standard prices are not applied to these additional service categories as they capture frequency counts only. Refer to Table RDI-H for codes to selected procedures.
1) Cardiac catheterization: Report all cardiac catheterizations performed separately. Do not report a cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a PCI in the cardiac catheterization rate; report only the PCI. Do not report PCI cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a CABG in the PCI or the cardiac catheterization rate; report only the CABG
Table RDI-H [Cardiac catheterization]
CPT: 93501, 93510, 93511, 93514, 93524, 93526-93529, 93539-93545

ICD-9 Procedure: 37.21-37.23, 88.55-88.57

2) PCI: Report all PCIs performed separately. Do not report PCI or cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a CABG in the PCI or the cardiac catheterization rate; report only the CABG
Table RDI-H [PCI]
CPT: 92980, 92982, 92995
HCPCS: G0290
ICD-9 Procedure: 00.66, 36.06, 36.07

3) CABG: Coronary artery bypass graft. Report each CABG only once for each date of service per patient, regardless of the number of arteries involved or the number or types of grafts involved.
Do not report PCI or cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a CABG in the PCI or the cardiac catheterization rate; report only the CABG.
Table RDI-H [CABG]
CPT: 33510-33514, 33516-33519, 33521-33523, 33533-33536
HCPCS: S2205-S2209
ICD-9 Procedure: 36.1, 36.2

4) Carotid endarterectomy: Report the number of carotid endarterectomies.
Table RCA-B [Carotid endarterectomy]
CPT: 34001, 35001, 35301, 35501, 35601

5) Carotid artery stenosis diagnostic test: Report the number of carotid artery stenosis diagnostic tests.
Table RCA-B [Carotid artery stenosis diagnostic test]
CPT: 75660, 75671, 75676, 75680, 75662, 75665

6) Cardiac computed tomography: Report the number of cardiac computed tomographies.
Table RCA-B [Cardiac computed tomography]
CPT: 75571, 75572, 75573, 75574

7) Report the number of coronary artery disease diagnostic tests using EBCT and nuclear imaging stress tests.
Table RCA-B [CAD diagnostic test using EBCT/nuclear imaging stress tests:]
CAD diagnostic test using EBCT or nuclear imaging stress test
CPT: 78491, 78492, 78469, 78466, 78468, 78459, 78473, 78483, 78472, 78469,78494, 78466, 78468, 75557, 75558, 75559, 75560, 75561, 75562, 75563, 75564, 78451, 78452, 78453, 78454, 78481
HCPCS: S8092

If needed, provide specifications URL (preferred) or as an attachment:

URL:
Please supply the username and password:
Attachment:

S9.8. Care Setting; *provides information on which care settings the measure encompasses.*

Ambulatory Care : Ambulatory Surgery Center (ASC)
Ambulatory Care : Clinic/Urgent Care
Ambulatory Care : Clinician Office
Dialysis Facility
Emergency Medical Services/Ambulance
Hospital/Acute Care Facility
Imaging Facility
Laboratory
Pharmacy
Post Acute/Long Term Care Facility : Nursing Home/Skilled Nursing Facility
Post Acute/Long Term Care Facility : Rehabilitation

S10.Adjustments for Comparability (Resource Use Measure Module 4)
External factors can mingle and affect or confound a measure's result. Confounding occurs if an extraneous factor causes or influences the outcome (e.g., higher resource use) and is associated with the exposure of interest (e.g., episode of diabetes with multiple co-morbidities). Measure developers often include steps to adjust the measure to increase comparability of results among providers, employers, and health plans.

S10.1. Risk adjustment method
Define risk adjustment variables and describe the conceptual, statistical, or other relevant aspects of the model and provide rationale for this methodology.

The current risk model utilized by NCQA is based on components of the CMS-HCC risk adjustment methodology and accounts for age, gender, and HHC-RRU risk classifications that predict cost variability. For each condition, members are assigned to a clinical cohort category that provides a more specific classification of the condition. For example, a member with Type 1 or Type 2 diabetes is assigned to one of 64 HCC-RRU risk categories based on diagnosis codes that are identified in claims for each member in the prior year. A members age, gender, and HCC category determines their risk score (cohort). NCQA then calculates the average per-member per-month (PMPM) cost for each cohort then weights that cost by the total member months within each cohort. Each plan will have its own weight for each cohort since case-mix varies across plans. These weighted cohort PMPMs are then summed across all cohorts to arrive at a PMPM that would be expected if the "average" plan had the same case-mix as the plan in question. The ratio of the observed to expected PMPM utilization indicates the degree to which a plan deviates from expected performance. This is known as indirect standardization.
Health plans submit the member month and summarized standardized cost separately for each member cohort, and NCQA calculates expected per member per month (PMPM) results. Thus, each health plan's RRU results are adjusted based on its mix of members.

The following steps assign each member a risk score and HCC-RRU risk reporting category for RRU measurement. Steps are implemented after the eligible population is identified:
Step 1: Identify the qualified service diagnosis.
Identify all diagnosis for face-to-face encounters during the treatment period.

- Outpatient, acute and nonacute inpatient, and ED services. Services with a CPT procedure code or UB Revenue code in Table RRU-E.
- Behavioral health services. Services with a CPT procedure code in Table HCC-B.
- Surgery and procedure services. Services with a CPT Procedure code in Table SPT-Surg-Proc.

Use all diagnosis codes for all services that meet the criteria listed above to complete the steps below.

Table RRU-E: Codes to Identify Visit Type
Outpatient
CPT: 92002, 92004, 92012, 92014, 98925-98929, 98940-98942, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99381-99387, 99391-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456
UB Revenue: 051x, 0520 -0523, 0526-0529, 057x-059x, 082x-085x, 088x, 0982, 0983
Nonacute inpatient
CPT: 99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337
UB Revenue: 0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient
CPT: 99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99291
UB Revenue: 010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x,021x, 072x, 080x, 0987
ED
CPT: 99281-99285
UB Revenue: 045x, 0981

Step 2: Assign each diagnosis code to one of the 184 Clinical Condition categories using Table HCC-C (CC-RRU). Exclude all diagnoses that cannot be assigned to a CC category. For members with no qualifying diagnoses from face-to-face encounters, skip to step 6.

Step 3: Determine HCC-RRUs for each CC identified. Refer to Table HCC-Rank.
For member's CC list, match the CC code to the CC code in the Table HCC-Rank, and assign:

- The ranking group
- The rank
- The HCC Group

Step 4: Select the highest ranked HCC-RRU in each ranking group.
For each ranking group, select only the highest ranking HCC using the "Rank" column (1 is the highest rank possible). Drop all other HCCs in each ranking group and if necessary, de-duplicate the HCC list.
For example, for member 1, the following HCCs would be listed:

- HCC-RRU-5
- HCC-RRU-15

Note: One CC-RRU can map to multiple HCC-RRUs; each HCC-RRU can have one or more CC-RRUs.

Step 5: Identify combination HCC-RRUs
Some combinations suggest a greater amount of risk when observed together. For example, when diabetes and CHF are present, an increased amount of risk is evident. Additional HCC-RRUs are selected to recognize these relationships. Compare each member's list of unique HCCs to those listed in the "HCC-RRU" column in Table HCC-RRU_F (http://www.ncqa.org/tabid/1252/Default.aspx) and assign any additional HCC conditions.

Step 6: Identify Demographic HCC-RRUs.
Assign each member to one age and gender category in Table RRU-HCC H based on age at the end of the treatment period.
Note: Each RRU measure has its own demographic criteria. For cardiovascular conditions, the demographic groups are gender and age (18-44, 45 -54, 55– 64, and 65-75). At the end of step 6, each member will have a final list of HCC-RRUs that includes at least one demographic HCC-RRU and zero, one or more HCC-RRUs based on the clinical categorizations described above.

Step 7: Calculate the weight for each member. For each HCC-RRU, assign a weight from Table HCC-E. (http://www.ncqa.org/tabid/1252/Default.aspx)

Step 8: Assign the member to a HCC-RRU risk cohort for reporting.
Assign members to a reporting risk category based on their risk score.
Category Lower Score Range Upper Score Range

1) 0.000-0.249
2) 0.250-0.499
3) 0.500-0.749
4) 0.750-0.999
5) 1.000-1.249
6) 1.250-1.499
7) 1.500-1.999
8) 2.000-2.499
9) 2.500-2.999
10) 3.000-3.999
11) 4.000-4.999
12) 5.000-5.999
13) 6.000-6.999 over

If needed, provide supplemental information via a web URL (preferred) or attachment with the risk adjustment specifications.

URL: http://www.ncqa.org/portals/0/hedisqm/RRU/BI%20NCQA_RRU_Publication_FINAL.pdf
Please supply the username and password:
Attachment:

S10.2. Stratification Method
Detail the stratification method including all variables, codes, logic or definitions required to

stratify the measure and rationale for this methodology

NCQA collects resource measures at the plan level and summarizes across reporting cohorts along the following dimensions:

a) Product line (3 levels): commercial, Medicaid, and Medicare;
b) Reporting type (2 levels): HMO and PPO;
c) Area level (2 levels): national and region;
d) Resource use or utilization (11 levels): inpatient facility, procedure and surgery (inpatient and outpatient), evaluation and management (inpatient and outpatient), laboratory services, imaging services, ambulatory pharmacy, inpatient discharges, emergency department discharges.

Stratification of RRU results to control for individual confounding variables is not performed since age, gender and risk variables (comorbidity and disease interactions) that affect healthcare costs are adjusted for in the RRU-HCC risk adjustment process. These include age and gender along with one of the 13 assigned HCC-RRU risk categories (e.g. male 18-44 HCC-RRU 1; male 18-44 HCC-RRU 2; male 18-44 HCC-RRU 3; etc…). However, in order to assist organizations in identifying opportunities for improvement, NCQA reports RRU results using the HCC-RRU cohorts as reporting strata. Reporting the measure results by these strata increases the ability of the reporting organizations to target areas for improvement without having to reverse engineer their measure results.

S10.3. Costing Method
Detail the costing method including the source of cost information, steps to capture, apply or estimate cost information, and provide rationale for this methodology.

RRU measures use NCQA's standardized prices. The organization does not report prices based on its contracts and fee schedules, rather it applies a standard price to each service, multiplies it by the number of units of service and reports the resulting standard cost. Using this approach protects proprietary fee schedules and contracts while supporting equitable measure comparison across organizations and across regions without requiring adjustment for levels of service payment. Each year,
NCQA updates RRU SPTs that catalog a unit price for each type of health service necessary to report the measure. The SPTs allow health plans to match resource use in various service categories to a standardized cost structure, thus translating utilization to relative resource use. The standard pricing approach is based on the following sources of data:

- Relative values from the Medicare Fee Schedule (Resource-Based Relative Value Scale, or RBRVS)
- Pharmacy prices published by First Bank Data
- Inpatient prices based on a model that uses a broad set of averages, representing different local, regional and national health plans across the country.

A plan maps a standard price to each service, multiplies it by the number of units of service and reports the resulting standard cost. It then calculates total standard costs for eligible members across different areas of clinical care and aggregates standard costs across services and members to compute the overall relative resource use.

All RRU measures report the standard cost for the following categories.

- Inpatient Facility
- Surgery and Procedure
- Inpatient Services
- Outpatient Services
- Evaluation and Management (E&M)
- Inpatient Services
- Outpatient Services
- Diagnostic Laboratory Services
- Diagnostic Imaging Services
- Pharmacy, Ambulatory

Calculating Standard Cost
The organization applies the SPTs to all services in each service category using the following steps.
Step 1: Identify eligible members for each major clinical condition and assign them into the appropriate HCC-RRU risk category (See Section S10.1)..

Step 2: Identify all services rendered during the treatment period for each service category.

- Inpatient Facility (services provided by a facility during an inpatient stay, standard price includes room and board and ancillary services)
- E&M (inpatient visits, and outpatient visits including office visits, consultations and other services)
- Surgery and Procedure (inpatient and outpatient procedures)
- Pharmacy (ambulatory prescriptions included in a member's pharmacy benefit)

Step 3: Multiply the standard price by the units of service to compute a standard cost for the service. Refer to each service category's instructions below to calculate standard cost.

Step 4: For each major clinical condition, aggregate or sum each eligible member's total standard cost for each service category.

Step 5: Aggregate and report the total standard cost at the member cohort level.

Step 6: In each service category, if a member's standard cost exceeds the cap amount, report the total standard cost including only the cap amount from Table SPT-CAP (http://www.ncqa.org/tabid/1277/Default.aspx). Do not exclude members who exceed the capped amount.Methods used to identify the unit of service and assign standard unit prices vary by service category. The steps required for calculating each category are described below.

Calculating Total Standard Cost: Inpatient Facility
Step 1: Identify all inpatient stays that occurred during the treatment period. Include stays that may have started before the treatment period or ended after the close of the treatment period. Define a single, unique record describing the member's inpatient stay.

Step 2: Determine the LOS for frequency reporting. Compute the LOS in days, using paid for or expected-to-be-paid-for days only. Include all paid days in the calculation, whether or not they fall inside the treatment period. Use this LOS when reporting the frequency counts for each inpatient stay.

Step 3: Determine the LOS category for standard cost reporting. Assign the appropriate LOS group using Table C.
Table C: Length of Stay Group

LOS (Days)	LOS GRP
1	A
2	B
3-4	C
5-6	D
7-8	E
9-15	F
16+	G

Step 4: Determine the LOS per diem multiplier. If the inpatient stay falls within the treatment period, use the total number of paid for or expected-to-be-paid-for days as the per diem multiplier. If the inpatient stay does not fall inside the treatment period, or if all days are not paid for or expected to be paid for, count only the days within the treatment period (including the last day of the treatment period) that are paid for or expected to be paid for, as the per diem multiplier.

Step 5: Determine if the inpatient stay is acute or nonacute. Nonacute stays include nursing home, skilled nursing facility, rehabilitation, hospice, hospital transitional care, swing bed and respite; all other inpatient stays are acute. For frequency reporting of inpatient stays, acute and nonacute stays will be reported separately.
Note: SPT-INP tables assign the Acute field a value of "1" if the discharge was from an acute inpatient stay and a value of "0" if the discharge is from a nonacute stay.

Step 6: Assign an Aggregate Diagnostic Service Category (ADSC) for the inpatient stay using the principal discharge diagnosis. To assign ADSC, download the ADSC Table from the NCQA Web site (www.ncqa.org) and match the principal ICD-9-CM Diagnosis code from the discharge claim to an ADSC. If the principal ICD-9-CM Diagnosis code is invalid or missing or cannot be determined, map the inpatient stay to the ADSC Table's MISA category.

Step 7: Determine if the member underwent major surgery during the inpatient stay. Identify major surgeries by using the list of codes from the Maj-Surg Table. Flag eligible members if one procedure code in the Maj-Surg-Table is present

from any provider during the stay.If the inpatient stay is acute and it has a major surgery, include it in the acute surgery category for frequency reporting. If the stay is acute but does not have a major surgery, include it in the Acute Medicine category. Nonacute stays are not categorized as surgical or non-surgical for frequency reporting. Note: SPT-INP-ADSC assigns the field MAJSURG a value of "1" to indicate the standard price when a major surgery is identified and a value of "0" if no major surgery is identified during the member's inpatient stay.

Step 8: Match each ADSC, LOS group, major surgery flag and acute or nonacute assignment for the stay to the NCQA-provided SPT to obtain the assigned standard price. Multiply the per diem multiplier by the per diem standard price to compute the total standard cost for the stay.
For frequency reporting, report the stay in the appropriate category based on the acute or nonacute assignment and surgery or medicine assignment.

Calculating Total Standard Cost: E&M
Step 1: Identify all E&M services that occurred during the treatment period. The valid E&M codes used to select these services are listed in Table SPT-EM (http://www.ncqa.org/tabid/1277/Default.aspx).

Step 2: Match each E&M service to the CPT codes in Table SPT-EM and assign the standard price to the E&M service.

Step 3: Multiply the standard price by the number of units associated with the E&M service. Most services have one unit.
Step 4: Sum the standard prices across the E&M services to calculate the total cost. Include all units of service on a claim line. Sum E&M services labeled as inpatient separate from those labeled as outpatient services.

Calculating Total Standard Cost: Surgery and Procedure
Step 1: Identify all surgery and procedure services provided by physicians and other professional providers during the treatment period. The valid procedure codes for these services are listed in Table SPT-Surg-Proc.

Step 2: Identify modifier codes. Procedure modifiers are sometimes used to define a service in more detail. The standard price for procedure modifiers varies, so these modifiers are combined with the procedure code to match to the appropriate row in the SPT table. Use only the applicable modifiers below to combine with procedure codes.

- 26 = Professional Component
- 50 = Bilateral Service
- 51 = Multiple Surgery
- 52 = Reduced Service
- 54 = Surgical Care Only
- 55 = Post-Surgical Care Only
- 56 = Pre-Op Surgical Care Only
- 62 = Two Surgeons
- 78 = Return to Operating Room
- 80–82 = Assistant at Surgery
- TC = Technical Component

If a procedure code is billed with a nonapplicable modifier, set the modifier to blank. If the procedure code has no modifiers or if all modifiers for a specific procedure code are not applicable, price the procedure code with a blank modifier. Surgery and Procedure CPT codes that have a proprietary modifier indicating an anesthesiology bill are not priced.

Step 3: Identify surgeries or procedures provided during an acute or nonacute inpatient stay. In the SPT, services provided in an inpatient setting are under the Excel workbook tab labeled "Std Price—IP Surgery" and services provided in an outpatient setting are under the Excel workbook tab labeled "Std Price—OP Surgery." Organizations can distinguish between services provided in an inpatient or outpatient setting in several ways.

- Treat a surgery or procedure as outpatient unless it has a POS code of 21, 31, 39, 51
- or 61.
- If the POS code is not available, determine if the member was admitted overnight for the surgery or procedure. If so, treat the surgery or procedure as inpatient; if not, treat it as outpatient.
- Treat a surgery as inpatient if it falls between the dates of an inpatient stay. If a surgery was used to classify an inpatient stay as surgical, price the surgery as inpatient.

Step 4: Download Table SPT-Surg-Proc for surgery and procedure services from the NCQA Web site (www.ncqa.org).

Step 5: Match each procedure code, applicable modifier and POS to obtain the assigned standard price for the service.

Step 6: Multiply the standard price by the number of units associated with the service. Most services have one unit.

Step 7: Sum the standard prices across the surgery and procedure services to calculate the total cost. Sum inpatient and outpatient costs separately.Note: Surgeries must be correctly classified as inpatient or outpatient because the overhead charges for inpatient surgeries are included in the Inpatient Facility Cost category. The overhead for outpatient surgeries are included in the total cost of the surgery. If the health care facility bills the plan for overhead charges using codes in the SPT-Surg-Proc table, those costs should not be counted in this category.

- Do not include services provided by anesthesiologists. If an anesthesiologist submits a claim or encounter with codes included in Table SPT-Surg-Proc, the claim or encounter for these services should not be included in the total cost.

Calculating Total Standard Cost: Laboratory Services
Step 1: Identify all lab services that occurred during the treatment period. The valid lab codes used to select these services are listed in Table SPT-LAB.

Step 2: Match each lab service to the codes in Table SPT-LAB and assign the standard price to the service.

Step 3: Multiply the standard price by the number of units associated with the lab service. Most services have one unit.

Step 4: Sum the standard prices across the lab services to calculate the total cost. Include all units of service on a claim line.

Calculating Total Standard Cost: Imaging Services
Step 1: Identify all Imaging services that occurred during the treatment period. The valid imaging codes used to select these services are listed in Table SPT-IMG.

Step 2: Match each imaging service to the codes in Table SPT-IMG and assign the standard price to the imaging service.

Step 3: Multiply the standard price by the number of units associated with the imaging service. Most services have one unit.

Step 4 Sum the standard prices across the imaging services to calculate the total cost. Include all units of service on a claim line.

Calculating Total Standard Cost: Pharmacy Services
Step 1: Identify all ambulatory prescriptions dispensed (pharmacy services) during the treatment period.

Step 2: Identify the NDC code and the metric quantity for each prescription. If metric quantity is available, the organization must use it to determine standard price. If the metric quantity is not available, the organization should use the standard unit price per day in the NCQA table.
An organization that uses proprietary or regional codes should map them to standard NDC codes.
Step 3: Download Table SPT-Pharm from the NCQA Web site ((http://www.ncqa.org/tabid/1277/Default.aspx). The table contains:

- The NDC code
- A standard unit price per metric quantity
- A standard unit price per day.
- Prescription category
    - Name brand only (N1)
    - Generic only (G1)
    - Name brand—Generic exists (N2)
    - Generic name—Name brand exists (G2)

Step 4: Match each NDC code to the appropriate row in Table SPT-Pharm.

Step 5: Aggregate and report service frequencies within each prescription category at the total level by organization for pharmacy prescription utilization.

Step 6: If the metric quantity is available, multiply the metric quantity dispensed by the standard price per metric quantity for each prescription.

Step 7: If the metric quantity is unavailable, multiply the days supply dispensed by the standard unit price per day for each prescription.

Step 8: Sum the unit prices for all unique prescription dispensing events.

S11. Measure Reporting (Resource Use Measure Module 5)
The measure developer must determine which of the following Measure Reporting functions: attribution approach, peer group, outliers and thresholds, sample size, and benchmarking and comparative estimates, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

S11.1. Detail attribution approach
Detail the attribution rule(s) used for attributing costs to providers and rationale for this methodology (e.g., a proportion of total measure cost or frequency of visits during the measure's measurement period) and provide rationale for this methodology.

Using administrative claims data submitted by all organizations, NCQA estimates the expected RRU amounts for each clinical condition for each organization. RRU index amounts are based on the ratio of observed to expected amounts. Results can be assessed at an overall basis, across all members and major clinical conditions, by service category or for a member cohort within a condition. Relative resource use is calculated at the plan-level and no attribution of resource use is made below this level. Attribution of resource use to a particular NCQA submission is based on the product line and reporting type of the plan that the member was enrolled in as of the end of the measure year.

S11.2.Identify and define peer group
Identify the peer group and detail how peer group is identified and provide rationale for this methodology

Specifications : There are multiple concepts of a "peer group" for the RRU measures. NCQA collects resource measures at the plan level and summarizes across reporting cohorts along the following dimensions:

- Product line (3 levels): commercial, Medicaid, and Medicare;
- Reporting type (2 levels): HMO and PPO;
- Area level (2 levels): national and region;
- Resource use or utilization (11 levels): inpatient facility, procedure and surgery (inpatient and outpatient), evaluation and management (inpatient and outpatient), laboratory services, imaging services, ambulatory pharmacy, inpatient discharges, emergency department discharges.

In the context of calculation of RRU ratios for risk adjustment purposes, NCQA uses indirect standardization to define a "case-mix peer group" for each plan relative to a hypothetical plan (with the same case-mix).The national average of PMPM resource use for each is used to calculate this "case-mix peer-group". Conceptually speaking, the "case-mix peer group" represents what we might expect resource use to look like from the "average" plan if it had the same case-mix as the observed plan.. Mathematically, this expected resource use is the national mean PMPM resource use for each cohort (weighted by the cohort's member months in an individual plan) summed up over all of the cohorts in the plan for each service category (e.g. Inpatient facility, Inpatient E&M, etc.). Resource use can be summed across service categories to get grand totals such as "Total Medical"..At this point, there is an estimate of observed resource use and an estimate of expected resource use.
In order to determine how different a plan is from its own hypothetical "case-mix peer-group" (i.e. how different observed resource use is from expected resource use, the observed and expected total costs are expressed as an observed to expected (O/E) ratio. If a plan used 10% fewer resources than expected, it would have an O/E ratio of 0.9. Conversely, a plan that used 10% more resources than expected, the O/E ratio would be 1.1.

These O/E ratios are subsequently indexed to facilitate comparisons of efficiency by region and by reporting type (e.g. HMO/PPO), with the "indexed peer group" defined by the average O/E ratio for all plans in the same region and of the same reporting type. The difference between the "case-mix peer group" and the "indexed peer group" is that the former is an intermediate step of risk-adjustment and the latter is a means for making comparisons within a plan type and within a region more straightforward.
After calculating the indexed O/E ratios, NCQA provides organizations with their relative resource index score at the service category and major clinical condition level.

- A score of 1.00 indicates that the observed amounts for standard costs or utilization are equal to the expected amounts for a given region and plan type.
- A score >1.00 indicates that the observed amounts for standard costs or utilization are greater than the expected amounts for a given region and plan type.
- A score <1.00 indicates that the observed amounts for standard costs or utilization are lower than the expected amounts for a given region and plan type.

For example, an organization whose indexed observed-to-expected ratio is 1.10 for pharmacy services in its Relative Resource Use for People With Cardiovascular Conditions measure has a total standard cost for pharmacy services for RCA that is 10 percent higher than the expected total pharmacy services cost for other plans in the same region and of the same plan type.

S11.3. Level of Analysis:

Clinician : Group/Practice
Health Plan
Integrated Delivery System
Population : National
Population : Regional

S11.4.Detail measure outliers or thresholds
Detail any threshold or outlier rules and decisions based on measure resource use and provide rationale for this methodology

Specifications : NCQA does not exclude any plan submission from the RRU calculations; however we do not publicly report any plan's result if the O/E ratio for the specific service category (or overall service category) is less than 0.33 or greater than 3.0, or whose eligible population (n) is <400.

S11.5.Detail sample size requirements
Detail the sample size requirement including rules associated with the type of measure

Specifications : Organizations submit all patients who meet the eligible population criteria for diabetes to NCQA; however we do not publicly report any organization whose eligible population (n) is <400.
The sample size of 400 is based on a bootstrap sampling approach in which the standard errors of each plan's O/E ratios for Total Medical and Total Pharmacy were calculated from 100 simulations in which plans were drawn from 44 market areas with pre-specified eligible populations of 30, 50, 100, 200, 400, 1000, and 2500. This analysis was conducted for the Diabetes, Asthma, and Acute Low Back Pain RRU measures. Across all three chronic diseases, the decrease in the average standard error (estimated over the 100 simulations) with increasing sample size begins to flatten out at a sample of size close to 400 indicating reliable estimates of the O/E ratios can be obtained for plans with as few as 400 cases of the chronic disease.

S11.6.Define benchmarking or comparative estimates
Detail steps to produce benchmarking and comparative estimates and provide rationale for this methodology

Specifications : A ratio of observed-to-expected resource use is calculated for each clinical condition for each plan. The observed value is the actual summarized use data that health plans submit to NCQA for each measure's eligible population. NCQA calculates the expected value, or the resources the plan would be expected to use if it performed at the average level of use for all other plans that submitted data with consideration of case mix differences between plans (See Section S11.2).
Upon obtaining these values, NCQA calculates an observed-to-expected ratio and reports it for each plan's national and regional peer group. If a plan reported that its level of resource use for all patients with diabetes was identical to the

average of all plans and the plan had a case mix of patients that was identical to the average for all plans, the observed and expected values would be the same and the O/E ratio would be 1.0.
If the plan used more resources for patients with diabetes than the average of all plans, but had the same (average) case mix, the actual reported RRU (observed) would be higher than expected and the O/E ratio would be >1.0.
Generally, NCQA calculates the index ratio, which compares a plan's resource use to the average performance of all health plans in a specific product line. NCQA does not set benchmarks or thresholds for the O/E or indexed ratios (other than the outlier exclusion for O/E ratios > 3 and < 0.¯33).

S12.Type of Score:

Frequency Distribution
Ratio
Weighted score/composite scale

If available, please provide a sample report:

S12_Sample Score Report_RDI.pdf

S12.1. Interpretation of Score.
(Classifies interpretation of score (s) according to whether higher or lower resource use amounts is associated with a higher or lower score, a score falling within a defined interval, or a passing score, etc)

RRU measures indicate how a plan uses a set of key resources (e.g., physician visits, hospital stays) to care for its members with specified diseases, compared with the average for plans in the same region and adjusted for the set of diseases and case mix of plan members. When used in tandem with quality measures, RRU results make it possible to simultaneously evaluate the quality of services and key elements that drive costs and premiums. As described in detail in Sections S11.2 and S11.6, a ratio of observed-to-expected resource use is calculated for each clinical condition for each plan which is then indexed to a mean of 1.0 to allow for equitable comparisons between plan peer groups. When considering RRUs for patients with diabetes, an RRU index ratio result of 1.00 indicates that a health plan used the same level of resources to treat its population of patients with diabetes as the average of all plans for a similar (case mix-adjusted) group of patients with diabetes. An index ratio of 1.12 indicates that a health plan used 12 percent more resources than their national or regional (depending on which benchmark is being used) peer average. An index ratio of 0.73 indicates that a plan used 27 percent fewer resources than the average of all plans for a similar (case mix-adjusted) group of patients.

S12.2. Detail Score Estimation
Detail steps to estimate measure score.

A ratio of observed-to-expected resource use is calculated for each clinical condition for each plan. The observed value is the actual summarized use data that health plans submit to NCQA for each measure's eligible population. NCQA calculates the expected value for each plan—the resources the plan would be expected to use if it performed at the average level of use for all other plans that submitted data, considering case mix differences between plans. NCQA then calculates an observed to expected ratio and reports it for each plan's national and regional peer group
The definitions below provide the rationale behind the type of score and how each are reported:
Observed (O): A plan's resource use, calculated using units of resources used (inpatient days) converted to dollar terms using the SPT and reported to NCQA. Summarized data are displayed as PMPM dollars for the four RRU service categories and as per 1,000 member years for the service frequency categories.

Expected (E): A plan's resource use assuming that the plan performed like an "average" plan with the same case-mix. NCQA provides these values to the plans.

O/E ratio: A plan's observed (reported) RRU values divided by its expected RRU values.

Indexed O/E ratio: The O/E ratio adjusted such that the mean of the O/E ratios for all plans equals 1.0

NCQA estimates and reports both the national peer group O/E results and the indexed plan type/regional peer group O/E

results. An indexed ratio result of 1.00 indicates that one plan's level of resource use is the same as the average of all plans' level of resource use. This calculation creates a method for purchasers to examine the differences in plan resource use for a specific condition.

S12.3. Describe discriminating results approach
Detail methods for discriminating differences (reporting with descriptive statistics--e.g., distribution, confidence intervals)

IDSS report information gives health plans an opportunity to identify areas where resource use is too high (O/E >1.0) or offers a benchmark of best performance. NCQA concurrently publishes an organization's RRU ratio, indexed ratio, and quality index ratios for both the national and regional peer groups.
The O/E ratio for each plan can indicate if that plan's O/E is different from 1 or not. These include confidence interval (CI) calculations for the national Total Medical and Total Pharmacy service categories. The O/E ratio for each plan can indicate if that plan's O/E is different from 1 or not. Unfortunately, statistical tests have not been developed to determine the statistical significance of differences between one plan's O/E ratio and another's.

Service category-specific confidence intervals for a given plan are calculated using the following.

95% Confidence Limit=O/E ratio ± 1.96 ×SE

where:

"SE" is the standard error
1.96 is the standard normal deviate that corresponds to a 95% confidence limit

The standard error (SE) that NCQA uses in the calculation of the plan confidence limits is derived through a bootstrap approach resulting in 100 simulations drawing from plans covering 44 market areas (Ingenix Impact Benchmark Database). These simulations result in plans with pre-specified eligible populations (30, 50, 100, 200, 400, 1000, and 2500). The standard error across simulations of O/E ratios for each eligible population size is the estimated standard error for the O/E ratio. For a given plan, the standard error chosen for the calculation of its confidence limit is the estimate corresponding to the nearest match on eligible population size (highest bootstrap sample size that an observed eligible population exceeds).

TESTING/ANALYSIS	
Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. See guidance on measure testing.	**Eval Rating**
TESTING ATTACHMENT (5MB or less) or URL: ***If needed, attach <u>supplemental</u> documentation (Save file as: SA_Reliability_Validity Testing) All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.*** URL: Please supply the username and password: Attachment: SA_Reliability_Validity Testing.pdf	
SA1. Reliability Testing ***For each module tested or for the overall measure score:*** **SA1.1. Data/sample** ***(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)*** For the diabetes conditions RRU measure (RDI), health plans report resource use for all members who meet the HEDIS	**2a2** **H☐** **M☐**

case definition for diabetes and also meet the measure eligibility criteria for age and who are not excluded for dominant conditions. NCQA then calculates observed and expected cost and expresses risk-adjusted resource use as the ratio of observed to expected per-member per-month utilization. Outlier ratios in excess of 3 or less than 0.33 are not publicly reported, nor are plans whose eligible populations are less than 400 members publically reported.
For the Relative Resource Use measurement set, NCQA annually conducts an analysis on the data submitted for the HEDIS RRU measures, including an examination of the reliability and validity of the current year data compared to all previous years data. The intent of this annual report is to ensure the continued reliability and consistency of the data used to calculate the RRU results. The primary data for these analyses are the HEDIS 2010 reports of relative resource use (RRU) by commercial, Medicaid, and Medicare plans. These results are reviewed by the Efficiency Measurement Advisory Panel (EMAP) and results are approved by the Committee on Performance Measurement. A standard set of questions are asked to ensure the validity and repeatability of the RRU results that are publically reported. The most recent annual RRU analytic report (2010) produced a number of key findings related to the continued reliability of resource measurement at the health plan level:

- •There were a sufficient number of plans reporting across all the RRU measures.
- Among the commercial health plans that submitted HEDIS data, approximately 88 percent submitted RRU data for diabetes. In 2010, 3.5% of 348 Commercial plans that reported RDI results could not publicly report results; due almost exclusively to eligible populations below 400 members.
- Among Medicare plans, approximately 43 percent of plans submitted RRU data for diabetes (n=162) of which approximately 18% would not have been subject to public release of their results, due almost exclusively to eligible populations below 400 members.
- Among Medicaid plans (HMO only) 53 percent submitted RRU data for diabetes (n = 94) of which approximately 20% would not have been subject to public release of their results due almost exclusively to eligible populations below 400 members.

SA1.2. Analytic Methods
(Describe method of reliability testing and rationale)

To help improve our understanding of the measures' performance, we have structured the analyses to provide comprehensive univariate information and selective correlational and multivariate analyses of the RRU data submitted to NCQA. By answering the following research questions, NCQA was able to set specific objectives for the 2010 RRU analysis to examine the continued reliability and validity of the RRU HEDIS data supporting the measures:

- •Are a sufficient number of plans reporting RRU data?
- •Did notice of public reporting of RRU results in 2010 result in a change in the number of makeup of plans that reported RRU in 2010?
- •Has the range in RRU results remained stable over time?
- •Did the number of plans identified as "outliers" change in 2010?
- •Are plans' observed-to-expected results for the RRU measures stable over time? Across all product lines, approximately nearly 90% of all plans shifted at most one quartile and within that group, over half did not change quartiles at all. Stability over time indicates that spurious observations and results are not common and that estimates of resource use are stable over time. Resource use for individual plans should not change appreciably.
- •Is there a relationship between plans' O/E results and quality results? There are few significant correlations between risk-adjusted resource use and the quality composite, all of which are weak at best.

SA1.3.Testing Results
(reliability statistics, assessment of adequacy in the context of norms for the test conducted)

The 2010 annual Analytic Report provided a number of conclusive results supporting previous validity and reliability testing of the RRU measures. RCA continues to perform strongly for the commercial product line and exhibits stability among the cohort of plans that are reporting the measure.
Between 2009 and 2010 health plan O/E results were stable. From 2009 to 2010, based on their RRU results (O/E) results, 97% of HMO plans placed in the same quartile or moved only to the neighboring quartile while 94% of PPOs moved less than 1 quartile. Around 1% of HMO and 1.7 of PPO moved from the highest to lowest quartile. Total Medical and Pharmacy RRU values were positively correlated between 2009 and 2010 among HMO plans while being somewhat condition-dependant for the commercial and Medicare PPO plans. Additionally, the range and variation in both the submitted data and final plan results were not found to be excessive nor was there a significant relationship noticed between health plan Total Medical O/E results and plan quality results.

L☐
I☐

SA1.4.Finding statement(s)—*(i.e., is the measure deemed reliable, limitations identified)*

The Efficiency Measurement Advisory Panel (EMAP), NCQA's external expert panel, reviewed submitted data and results and determined that all five of the RRU measures demonstrated reliability and validity. These determinations were supported by NCQA's Committee on Performance Measurement (CPM).

SA2.Validity Testing
For each module tested or for the overall measure score:

SA2.1. Data/Sample
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

To guide the development of the RRU measures (2004-2010), NCQA convened an expert advisory panel, the Efficiency Measurement Advisory Panel (EMAP) to discuss different methodological issues related to RRU measurement and develop an approach to measure relative resource use.
Using a large managed care database and Integrated Healthcare Information Services, Inc (IHCIS), NCQA performed research focusing on different methodological issues proposed by the EMAP. The approach to measurement used for the investigation focused on creating and testing a meaningful and "manageable" approach as seen below.

- 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.

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

SA2.2.Analytic Method **2b2**
(Describe method of validity testing and rationale; if face validity, describe systematic assessment)

For the developmental phase of the RRU measures, 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), procedures (including outpatient facility and ambulatory surgical center services), laboratory, and imaging services. 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 by the EMAP that collecting true unit price would not be possible due to the proprietary nature of prices and discounts negotiated between health plans and providers. For the purposes of the developmental field test, pricing levels reflect total allowed payments, inclusive of health plan liability and patient cost-sharing. Costs were reported by a cost

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per patient per month (PMPM) measure. Since a standard costing methodology was employed for the field test 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.

Early in measure development (2004-2005), two different approaches were testedto 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 14 pharmacy claims. Examples of ETGs are: insulin-dependent diabetes, with co-morbidity; coronary disease, with AMI, with coronary artery bypass graft; and asthma, without comorbidity, 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.

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 15 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
- Females, 18-44 years
- Males, 18-44 years

- All, 45-54 years
- All, 55-64 years
- All, 65-74 years
- All, 75+ 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 an ERG-based Morbidity Adjustment – using ERGs within clinical categories, including with and without co-morbidity alongside an "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.)

SA2.3.Testing Results
(statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment)

The investigations described in attachment SA_Reliability_Validity Testing provided insights into the conceptual and methodological issues in measuring relative utilization at a health plan level. Using a large research database, the study addressed a number of questions related to assessing resource utilization at the health plan and population levels. The following questions were assessed during the initial validity testing of the RRU approach:
Question 1: 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?
Interpretation (See Table 5, page 35 of attached file "SA_Reliability_Validity Testing")::

- 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.

Question 2: 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?
Interpretation (See Table 6, page 36 of attached file "SA_Reliability_Validity Testing")::

- 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.

Question 3: What is the magnitude of disease-related costs for each clinical grouping? How do these amounts vary by service category?
Interpretation (See Tables 7&8, pp. 38-40 of attached file "SA_Reliability_Validity Testing"):

- 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 comorbidity, where the DID amounts were higher (for total services and other service categories). In general, findings were comparable between the two approaches.

Findings on Relative Resource Utilization – Variation by Type of Service:

- 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.

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. 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 pp. 38 of attached file "SA_Reliability_Validity Testing"). 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.

Findings on Relative Resource Utilization – Variation Across Clinical Category:

- 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

- 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.

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.

SA2.4. Finding statement(s)—(*i.e., is the measure deemed reliable, limitations identified)*

The Measuring Health Plan Relative Resource Utilization study (2005) produced a number of key findings related to resource measurement; however, we are still challenged by the value of these metrics and their meaning to purchasers. The study conclusively determined that:

- 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. 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 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.

SA3.Testing for Measure Exclusions

SA3.1. Describe how the impact of exclusions (if specified) is transparent as required in the criteria

Measure specifications require that members of plans in all three product lines who had evidence of other dominant medical conditions, such as active cancer, organ transplants, end stage renal disease (ESRD) or HIV/AIDS, are required to be excluded from RRU measurement. Patient age criteria are also used to exclude individuals, specifically: patients less than 18 years of age or greater than 75 years of age are excluded from diabetes.

SA3.2. Data/sample for analysis of exclusions
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

N/A-NCQA did not conduct specific testing on the effect of the mandatory exclusion on the results of the RRU measures.

SA3.3. Analytic Method
(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference)

2b3

N/A

SA3.4. Results
(statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses)

N/A

SA3.5. Finding statement(s)-- ***(i.e., is the measure deemed reliable, limitations identified)***

N/A

SA4. Testing Population
Which populations were included in the testing data? (Check all that apply)

Commercial
Medicaid
Medicare

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SA5. Risk adjustment strategy

Refer to items S10.1 and S10.2 to rate this criterion.

2b4

H☐ M☐ L☐ I☐

SA6. Data analysis and scoring methods

Refer to items S12-S12.3 to rate this criterion.

2b5

H☐ M☐

	L☐ I☐
SA7. Multiple data sources ***Refer to S7 & all SA1 items to evaluate this criterion.***	**2b6** H☐ M☐ L☐ I☐ NA☐
SA6. Stratification of Disparities (if applicable) ***Refer to item S10.2 to rate this criterion.***	**2c** H☐ M☐ L☐ I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties*?	
Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met? **Rationale:**	Y☐ N☐
USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.	**Eval Rating**
Meaningful, Understandable, and Useful Information **U1. Current Use:** Internal quality improvement Public reporting (disclosure to performance results to the public at large) Quality improvement with external benchmarking **U1.1. Use in Public Reporting Initiative Use in Public Reporting.** ***Disclosure of performance results to the public at large (If used in a public reporting program, provide name of program(s), locations, Web page URL(s). If not publicly reported in a national or community program, state the plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement)*** Relative Resource Use results are reported through NCQA´s Quality CompassTM: Relative Resource Use module on an annual basis. http://www.ncqa.org/tabid/177/Default.aspx National RRU aggregate results are also published in the annual State of Health Care Quality report. http://www.ncqa.org/tabid/836/Default.aspx **U1.2. Use in QI** ***(If used in improvement programs, provide name of program(s), locations, Web page URL(s)).*** N/A **U1.3. Use for other Accountability Functions (payment, certification, accreditation)** ***(If used in a public accountability program, provide name of program(s), locations, Web page URL(s).*** RRU measures are not currently used for accreditation scoring	**3a** H☐ M☐ L☐ I☐

U2. Testing of Interpretability ***(Provide a rationale for why the measure performance results are meaningful, understandable, and useful to the intended audience(s) for both public reporting and quality improvement).*** **U2.1. If understanding or usefulness was demonstrated** ***(e.g., through systematic feedback from users, focus group, cognitive testing, analysis of quality improvement initiatives) describe the data, methods, and results.*** NCQA has reached out to health plans and users of RRU data, along with employer focus groups, in order to assess comprehension and utilization of RRU results. In addition, NCQA has published a number of resource documents outlining the possible uses for RRU data as well as suggestions for how the results might be used to engage in payer-purchaser conversations during selection. NCQA has also presented series of webinars each designed for specific audiences to facilitate understanding of the results and how they should be interpreted and used. The stakeholders that were approached were very positive about the extra effort made by NCQA to assist in the understanding of the RRU measures and their results as they are a set of extremely complex measures. Session-specific assessments were collected by NCQA's education department and the results of these assessments and the direct feedback from the first round of webinars and presentations to all groups was analyzed in order to ensure that it was appropriate to the intended audience. NCQA is currently collecting information from specific users of RRU data to capture their experiences with the first year of publically available RRU data. We plan to release a follow up publication that contains a number of user experiences and "best practices" form the field to further assist NCQA's customers. Due to the high volume of publications and other educational materials available, NCQA created a website dedicated to RRU (www.ncqa.org/rru) where all pertinent supporting documents and tools are posted for public access. Currently, following the first year of publicly available RRU data, NCQA is conducting additional qualitative assessments of user experiences documenting innovations in use of data and how the results were received and understood by the general public.	**3b** **H☐** **M☐** **L☐** **NA☐**
U2.2. Resource use data and result can be decomposed for transparency and understanding. ***Refer to items S11 -S12.3.***	**3c** **H☐** **M☐** **L☐** **I☐**
U3. If there are similar or related measures (either same measure focus or target population) measures (both the same measure focus and same target population), list the NQF # and title of all related and/or similar measures. **U3.1. If this measure has EITHER the same measure focus OR the same target population as NQF-endorsed measure(s): Are the measure specifications completely harmonized?** Yes **U3.2. If the measure specifications are not completely harmonized identify the differences, rationale, and impact on interpretability and data collection burden.** ***Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)***	**3d** **H☐** **M☐** **L☐** **I☐** **NA☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?	
Steering Committee: Overall, to what extent was the criterion, *Usability*, met?	**H☐**

Rationale:	**M☐ L☐**
FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement.	Eval Rating
F1. Data Elements Generated as Byproduct of Care Processes ***How are the data elements needed to compute measure scores generated? Data used in the measure are:*** Generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims) Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry)	**4a** **H☐ M☐ L☐ I☐**
F2. Electronic Sources ***Are the data elements needed for the measure as specified available electronically? (Elements that are needed to compute measure scores are in defined, computer-readable fields)*** ALL data elements are in a combination of electronic sources **F2.1. If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.**	**4b** **H☐ M☐ L☐ I☐**
F3. Susceptibility to Inaccuracies, Errors, or Unintended Consequences ***Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to minimize or prevent. If audited, provide results.*** NCQA recognizes that, despite the clear specifications defined for HEDIS RRU, data collection and calculation methods may vary, and other errors may taint the results, diminishing the usefulness of HEDIS data for managed care organization (MCO) comparison. In order for HEDIS to reach its full potential, NCQA conducts an independent audit of HEDIS collection and reporting processes, as well as an audit of the data which are manipulated by those processes, in order to verify that HEDIS specifications are met. NCQA has developed a precise, standardized methodology for verifying the integrity of HEDIS collection and calculation processes through a two-part program consisting of an overall information systems capabilities assessment (IS standards) followed by an evaluation of the MCO´s ability to comply with HEDIS specifications (HD standards). NCQA-certified auditors using standard audit methodologies will help enable purchasers to make more reliable "apples-to-apples" comparisons between health plans. The HEDIS Compliance Audit addresses the following functions: 1) information practices and control procedures 2) sampling methods and procedures 3) data integrity 4) compliance with HEDIS specifications 5) analytic file production 6) reporting and documentation	**4c** **H☐ M☐ L☐ I☐**
F4. Data Collection Strategy ***Describe what you have learned/modified as a result of testing regarding barriers to operational use of the measure (e.g., availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, cost of proprietary measures).***	**4d** **H☐ M☐ L☐**

NA – measure currently is in use.	I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility*?	
Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met? **Rationale:**	**H☐** **M☐** **L☐**

RECOMMENDATION

Steering Committee: Do you recommend for endorsement? **Comments:**	**Y☐** **N☐** **A☐**

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner)

Co.1 Organization

National Committee for Quality Assurance (NCQA), 1100 13th Street NW, STE 1000, Washington, District Of Columbia, 20005

Co.2 Point of Contact

Ben, Hamlin, MPH, hamlin@ncqa.org, 202-955-1716-

Measure Developer If different from Measure Steward

Co.3 Organization

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Co.4 Point of Contact

Ben, Hamlin, MPH, hamlin@ncqa.org, 202-955-1716-

Co.5 Submitter If different from Measure Steward POC

Ben, Hamlin, MPH, hamlin@ncqa.org, 202-955-1716-, National Committee for Quality Assurance (NCQA)

Co.6 Additional organizations that sponsored/participated in measure development

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

Kathleen Curtin, RN, MBA, NP
Kaleida Health System

Michael DeLorenzo

Health Dialog Analytic Solutions

Dan Dunn, PhD
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CIGNA Healthcare

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Matt Stiefel, MPA
Institute for Healthcare Improvement

Timothy Zeddies, PhD, MHSA (Chair)
HMC Informatics/Reporting

Ranyan Lu
United Health Network

Bob Kelly
Thomson Reuters

The Efficiency Measurement Advisory panel (EMAP) has guided NCQA staff through most of the measure development process. They EMAP provide methodological expertise as well as feedback from their respective organizations experiences in programming the measures. Specific members of the panel have created large research datasets (under contract with NCQA) in which NCQA tests measure concept s and refinements to the measure specifications prior to public release

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released:

2007

Ad.3 Month and Year of most recent revision:

12, 2010

Ad.4 What is your frequency for review/update of this measure?

annual

Ad.5 When is the next scheduled review/update for this measure?

05, 2011

Ad.6 Copyright statement:

Ad.7 Disclaimers:

Ad. 7 Date of Submission (*MM/DD/YY*)**:**

02/28/2011

Relative Resource Use for People With Diabetes (RDI)

Description

The relative resource use by members with diabetes during the measurement year.

Eligible Population

Note: *The eligible population is based on the CDC measure. It contains additional exclusion criteria and is stratified into HCC-RRU risk categories).*

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	18–75 years as of December 31 of the measurement year.
Continuous enrollment	The measurement year.
Allowable gap	No more than one gap in enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.
Benefit	Medical.
Event/ diagnosis	There are two ways to identify members with diabetes: by pharmacy data and by claim/ encounter data. The organization must use both methods to identify the eligible population, but a member only needs to be identified by one method to be included in the measure. Members may be identified as having diabetes during the measurement year or the year prior to the measurement year. *Pharmacy data.* Members who were dispensed insulin or oral hypoglycemics/antihyperglycemics during the measurement year or the year prior to the measurement year, on an ambulatory basis (Table CDC-A). *Claim/encounter data.* Members who had two face-to-face encounters in an outpatient setting or nonacute inpatient setting, or one face-to-face encounter in an acute inpatient or ED setting, with any diagnosis of diabetes (Table CDC-B), on different dates of service during the measurement year or the year prior to the measurement year. The organization may count services that occur over both years. Refer to Table CDC-C for codes to identify visit type.

Exclusions *(optional)*

- Members with any diagnosis of polycystic ovaries who did not have any face-to-face encounters, in any setting, with any diagnosis of diabetes during the measurement year or the year prior to the measurement year. Diagnosis may occur at any time in the member's history, but must have occurred by December 31 of the measurement year. Refer to Table CDC-B for codes to identify any diagnosis of diabetes; refer to Table CDC-O for codes to identify any diagnosis of polycystic ovaries.

- Members with gestational or steroid-induced diabetes who did not have any face-to-face encounters, in any setting, with any diagnosis of diabetes during the measurement year or year prior to the measurement year. Diagnosis may occur during the measurement year or the year prior to the measurement year, but must have occurred by December 31 of the measurement year. Refer to Table CDC-B for codes to identify any diagnosis of diabetes; refer to Table CDC-O for codes to identify gestational and steroid-induced diabetes.

Note: *Organizations that apply the optional exclusions for the CDC measure* must *apply them for the RDI measure. Organizations that do not apply the optional exclusions for the CDC measure* should not *apply the optional exclusion for the RDI measure. Because RDI is administrative only, do not exclude members from this measure based on exclusions found during chart review for the CDC measure. Members must be included in RDI even if they are excluded during chart review for CDC.*

Exclusions *(required)*

Members with one or more of the following dominant conditions during the measurement year should be excluded from all RRU measures.

- *Active cancer.* Members who had at least one face-to-face encounter, in any setting, with any diagnosis of cancer in conjunction with any treatment code (Table RRU-A), during the measurement year.
- *ESRD.* Members who had at least one face-to-face encounter, in any setting, with any code to identify ESRD (Table RRU-B), during the measurement year.
- *Organ transplant.* Members who had at least one face-to-face encounter, in any setting, with any code to identify organ transplant (Table RRU-C), during the measurement year.
- *HIV/AIDS.* Members who had at least two face-to-face encounters in an outpatient or nonacute inpatient setting, or at least one face-to-face encounter in an acute inpatient or ED setting, with any diagnosis of HIV (Table RRU-D), with different dates of service during the measurement year. Refer to Table RRU-E for codes to identify visit type.

Table RRU-A: Codes to Identify Active Cancer Treatment

Description	ICD-9-CM Diagnosis
Cancer	140-209, 230-239

WITH

Description	CPT	ICD-9-CM Procedure	UB Revenue
Treatment	38230, 38240-38242, 77261-77799, 79005-79999, 96401-96549	00.10, 00.15, 41.0, 41.91, 92.2, 99.25, 99.28, 99.85	028x, 033x, 0342, 0344, 0973

Table RRU-B: Codes to Identify ESRD

Description	CPT	HCPCS	ICD-9-CM Diagnosis	ICD-9-CM Procedure	UB Revenue	UB Type of Bill	POS
ESRD (including renal dialysis)	36145, 36147, 36800-36821, 36831-36833, 90919-90921, 90923-90925, 90935, 90937, 90940, 90945, 90947, 90957-90962, 90965, 90966, 90969, 90970, 90989, 90993, 90997, 90999, 99512	G0257, G0311-G0319, G0321-G0323, G0325-G0327, G0392, G0393, S9339	585.5, 585.6, V42.0, V45.1, V56	38.95, 39.27, 39.42, 39.43, 39.53, 39.93, 39.94, 39.95, 54.98	080x, 082x-085x, 088x	72x	65

Table RRU-C: Codes to Identify Organ Transplant

Description	CPT	HCPCS	ICD-9-CM Procedure	UB Revenue
Organ transplant	32850-32856, 33930-33945, 44132-44137, 44715-44721, 47133-47147, 48160, 48550-48556, 50300-50380	S2152, S2053-S2055, S2060, S2061, S2065	33.5, 33.6, 37.5, 41.94, 46.97, 50.5, 52.8, 55.6	0362, 0367, 0810-0813, 0819

Table RRU-D: Codes to Identify HIV

Description	ICD-9-CM Diagnosis
HIV	042

Table RRU-E: Codes to Identify Visit Type

Description	CPT	UB Revenue
Outpatient	92002, 92004, 92012, 92014, 98925-98929, 98940-98942, 99201-99205, 99211-99215, 99217-99220, 99241-99245, 99341-99345, 99347-99350, 99381-99387, 99391-99397, 99401-99404, 99411, 99412, 99420, 99429, 99455, 99456	051x, 0520-0523, 0526-0529, 057x-059x, 082x-085x, 088x, 0982, 0983
Nonacute inpatient	99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337	0118, 0128, 0138, 0148, 0158, 019x, 0524, 0525, 055x, 066x
Acute inpatient	99221-99223, 99231-99233, 99238, 99239, 99251-99255, 99291	010x, 0110-0114, 0119, 0120-0124, 0129, 0130-0134, 0139, 0140-0144, 0149, 0150-0154, 0159, 016x, 020x,021x, 072x, 080x, 0987
ED	99281-99285	045x, 0981

Categorization of Eligible Population

Major clinical condition Diabetes.

Standard Cost Calculations

The measure reports total standard costs for all services for which the organization has paid or expects to pay for the eligible population during the treatment period. Total standard costs are assigned by matching codes for services rendered to codes listed in the NCQA SPTs (the tables will be posted to NCQA's Web site by November 15, 2011).

Apply standard price SPTs categorize services as follows.

- Inpatient Facility
- E&M
  - Inpatient Services
  - Outpatient Services
- Laboratory Services
- Surgery and Procedure

Inpatient Services

Outpatient Services

- Imaging Services
- Pharmacy

Count all services listed in the SPTs rendered to members in the eligible population during the treatment period. Refer to the *Calculating Standard Cost* instructions in the *Guidelines for Cost of Care* for steps on categorizing services and linking service data to NCQA's SPTs.

Calculate total cost

Sum the total standard cost for each eligible member. Within each service category, if a member's standard cost exceeds the service category cap amount, report the total standard cost specified in the NCQA Cost Cap Amounts table (released with the SPTs).

Sum and report the total standard cost for the eligible population in each service category by member cohort. For RDI the reporting cohorts are:

- 18-44
- 45-64
- 65-75

Service Frequency Calculations

Total frequency of service

Service frequency counts are reported for all services for which the organization has paid or expects to pay for the eligible population during the treatment period. Organizations capture each eligible member's services rendered during the treatment period for the following utilization categories.

- Total Inpatient Facility: Discharges, Days and ALOS
  - Acute Inpatient: Discharges, Days, ALOS
  - Acute Medicine: Discharges, Days, ALOS
  - Acute Surgery: Discharges, Days, ALOS
  - Nonacute: Discharges, Days, ALOS
- ED Discharges
- Pharmacy Utilization
  - Name brand only (N1)
  - Name brand—Generic exists (N2)
  - Generic only (G1)
  - Generic name—Name brand exists (G2):
- Cardiac Catheterization
- PCI
- CABG
- Carotid Endarterectomy
- Carotid Artery Stenosis Diagnostic Test
- Cardiac Computed Tomography
- CAD Diagnostic Test Using EBCT/Nuclear Imaging Stress Test

Refer to the instructions in the *Guidelines for Cost of Care.* The Pharmacy Utilization categories are included in Table SPT-Pharm.

Inpatient Facility

This category measures the number of acute and nonacute inpatient facility discharges, days and ALOS regardless of diagnosis. Count each discharge once. Include data from any institution that provides acute or long-term/specialty nonacute care.

If days from the stay are counted in the cost calculation, the stay should also be counted in the inpatient frequency calculation.

Refer to the *Guidelines for Cost of Care* to identify acute inpatient (including medicine and surgery) and nonacute discharges, days and ALOS. For nonacute discharges, days and ALOS, include care from any institution that provides nonacute care in hospice, nursing homes, rehabilitation, SNFs, transitional care and respite.

ED Discharges

This category measures use of ED services.

Count each visit to an ED during the treatment period that does not result in an inpatient stay, regardless of the intensity of care required during the stay or the length of stay. Count only one ED visit per date of service. Do not count visits to urgent care centers.

Refer to Table AMB-B for codes to identify ED visits. Services for members admitted to the hospital from an ED visit are included in the Inpatient Facility category only.

Pharmacy Utilization

Use Table SPT-Pharm to identify the prescription categories for each drug dispensed in the treatment period.

Sum and report the number of prescriptions in each of the four categories in the Pharmacy—Total Service Frequency by Prescription Category table.

Other condition-specific categories:

Refer to Table RDI-H for codes to selected procedures and to the instructions in the *Guidelines for Cost of Care.*

Cardiac catheterization

Report all cardiac catheterizations performed separately. Do not report a cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a PCI in the cardiac catheterization rate; report only the PCI.

Do not report PCI cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a CABG in the PCI or the cardiac catheterization rate; report only the CABG.

PCI

Report all PCIs performed separately. Do not report PCI or cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a CABG in the PCI or the cardiac catheterization rate; report only the CABG.

CABG

Coronary artery bypass graft. Report each CABG only once for each date of service per patient, regardless of the number of arteries involved or the number or types of grafts involved.

Do not report PCI or cardiac catheterization performed in conjunction with (i.e., on the same date of service as) a CABG in the PCI or the cardiac catheterization rate; report only the CABG.

Carotid endarterectomy Report the number of carotid endarterectomies.

Carotid artery stenosis diagnostic test Report the number of carotid artery stenosis diagnostic tests.

Cardiac computed tomography Report the number of cardiac computed tomographies.

CAD diagnostic test using EBCT/nuclear imaging stress tests Report the number of coronary artery disease diagnostic tests using EBCT and nuclear imaging stress tests.

Table RDI-H: Codes to Identify Selected Procedures

Description	CPT	HCPCS	ICD-9-CM Procedure
Cardiac catheterization	93501, 93510, 93511, 93514, 93524, 93526-93529, 93539-93545		37.21-37.23, 88.55-88.57
PCI	92980, 92982, 92995	G0290	00.66, 36.06, 36.07
CABG	33510-33514, 33516-33519, 33521-33523, 33533-33536	S2205-S2209	36.1, 36.2
Carotid endarterectomy	34001, 35001, 35301, 35501, 35601		38.12
Carotid artery stenosis diagnostic test	75660, 75671, 75676, 75680, 75662, 75665		
CAD diagnostic test using EBCT or nuclear imaging stress test	78491, 78492, 78469, 78466, 78468, 78459, 78473, 78483, 78472, 78469,78494, 78466, 78468, 75557, 75558, 75559, 75560, 75561, 75562, 75563, 75564, 78451, 78452, 78453, 78454, 78481	S8092	
Cardiac computed tomography	75571, 75572, 75573, 75574		

Quality Compass RRU (Commercial) - Diabetes

Plan Detail Table:

Submeasure Data

Measure: Relative Resource Use for People with Diabetes
Plan: [redacted]
Sub Trend ID: [redacted]

Print

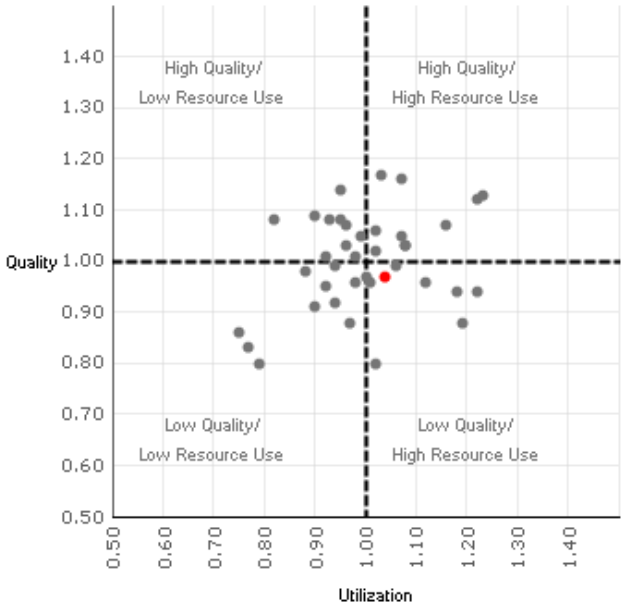
			National			Regional		
			Ratio	Lower Confidence Interval	Upper Confidence Interval	Ratio	Lower Confidence Interval	Upper Confidence Interval
Quality Composite Index			0.93	0.74	1.26	0.97	0.72	1.28
Total Medical Index			1.05	0.79	1.21	1.04		
Pharmacy (Rx) Index			0.92	0.90	1.10	0.98		
Total Medical Components	Inpatient Facility Index		1.05			1.07		
	Procedure & Surgery Index	Total	0.99			0.93		
		Inpatient	1.16			1.14		
		Outpatient	0.93			0.86		
	Evaluation & Management Index	Total	1.11			1.09		
		Inpatient	1.31			1.28		
		Outpatient	1.09			1.06		
Inpatient Discharge Index			0.92			0.96		
Emergency Department Discharge Index			0.80			0.77		

Regional Scatterplot for plan RRU graphed with Quality Index

Print Download

Atlanta Region HMO Submissions
Measure: Relative Resource Use for People with Diabetes
Plan: [redacted]
Sub Trend ID: [redacted]

- Selected submission
- Selected submission outside of range
- Region submission
- Region submission outside of range



Measuring Health Plan Relative Resource Utilization

May 2005

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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.
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- 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.)
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- 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 form 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
2. risk score 1.00 to less than 2.00
3. risk score 2.00 to less than 4.00
4. risk score 4.00 to less than 8.00
5. risk score 8.00 to less than 12.00
6. risk score 12.00 to less than 15.00
7. risk score 15.00 to less than 20.00
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
- Females, 18-44 years
- Males, 18-44 years
- All, 45-54 years
- All, 55-64 years
- All, 65-74 years
- All, 75+ 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 to 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
[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.

List of Appendix Tables

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%

	Populations							
Clinical Grouping	H	J	M	O	Q	R	S	All Commercial Plans (A-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 CoMorbidities						
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 CoMorbidities						
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%

This table shows the percentage of total members identified for a clinical grouping that were also identified for 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
Final Results Table

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).

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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.

NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
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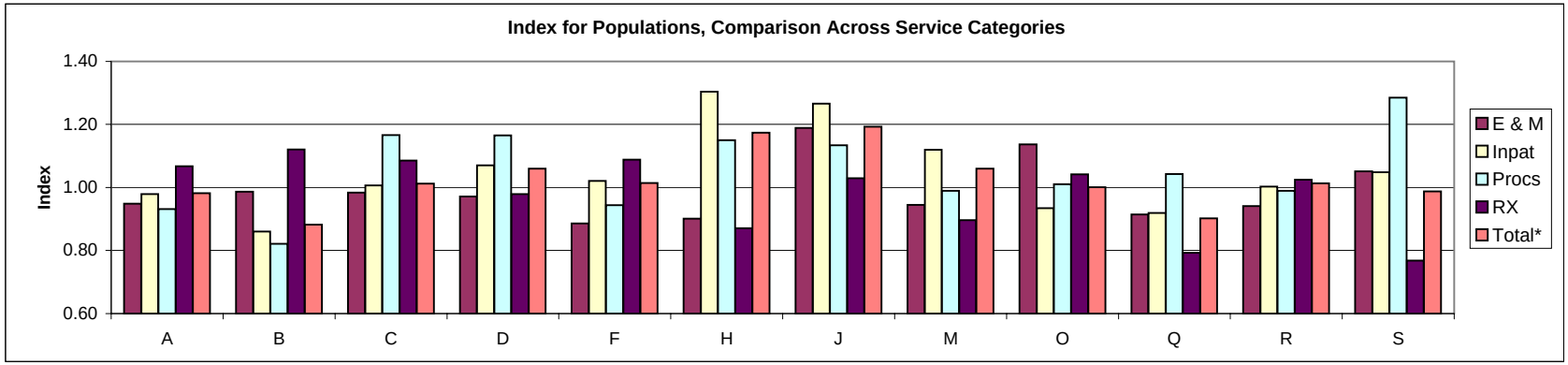
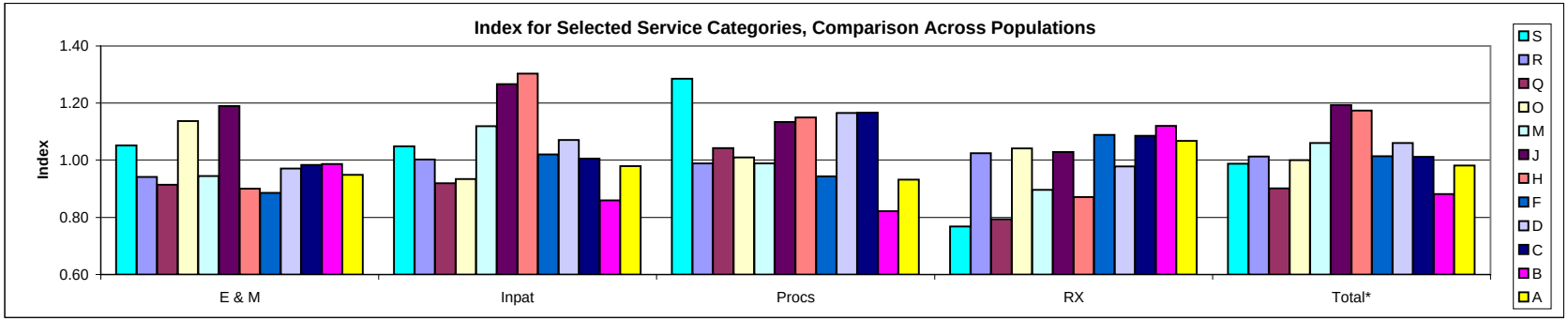
Table 7: Resource Consumption Index, Total Patient Costs, by Population and Service Category, Cardiovascular Clinical Groupings
ERGs used for Risk Adjustment

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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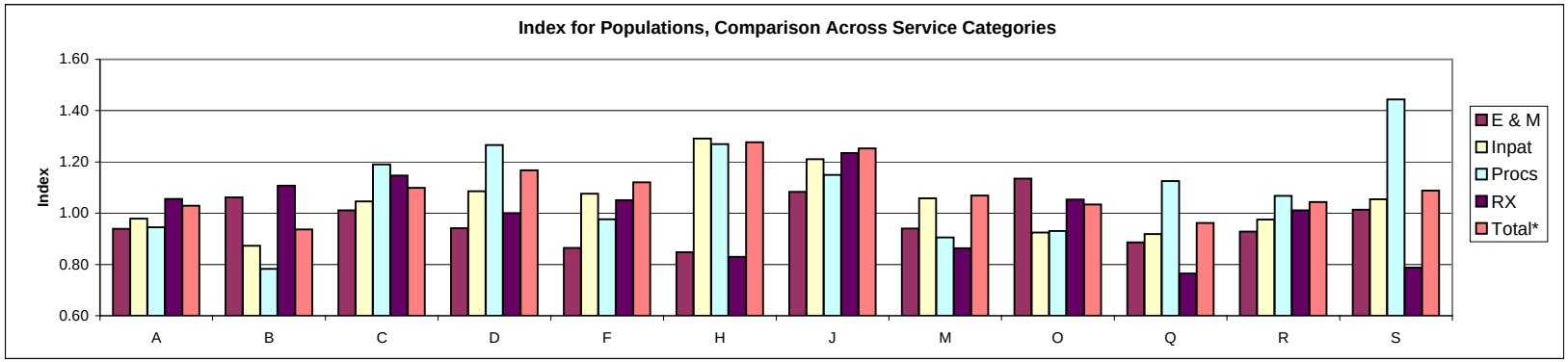
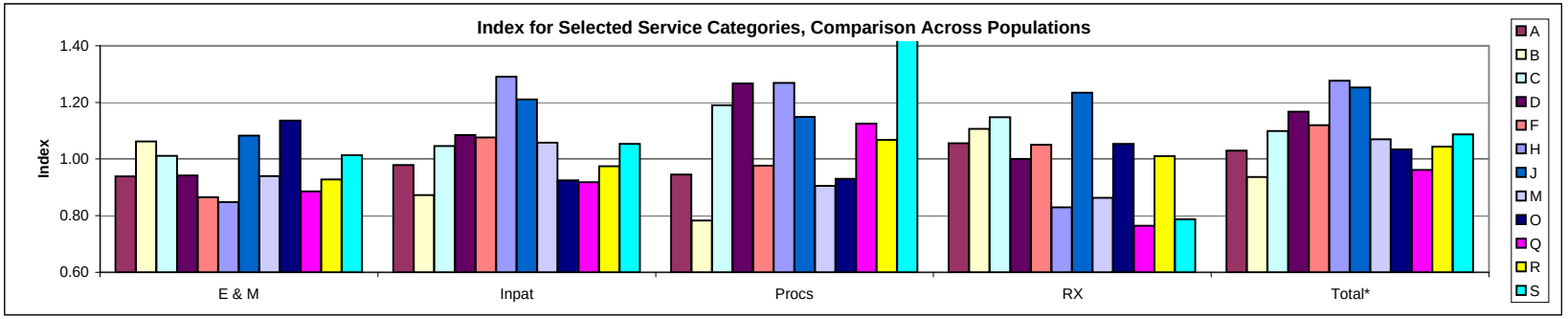
Table 8: Resource Consumption Index, Disease-Related Patient Costs, by Population and Service Category,

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
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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

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).

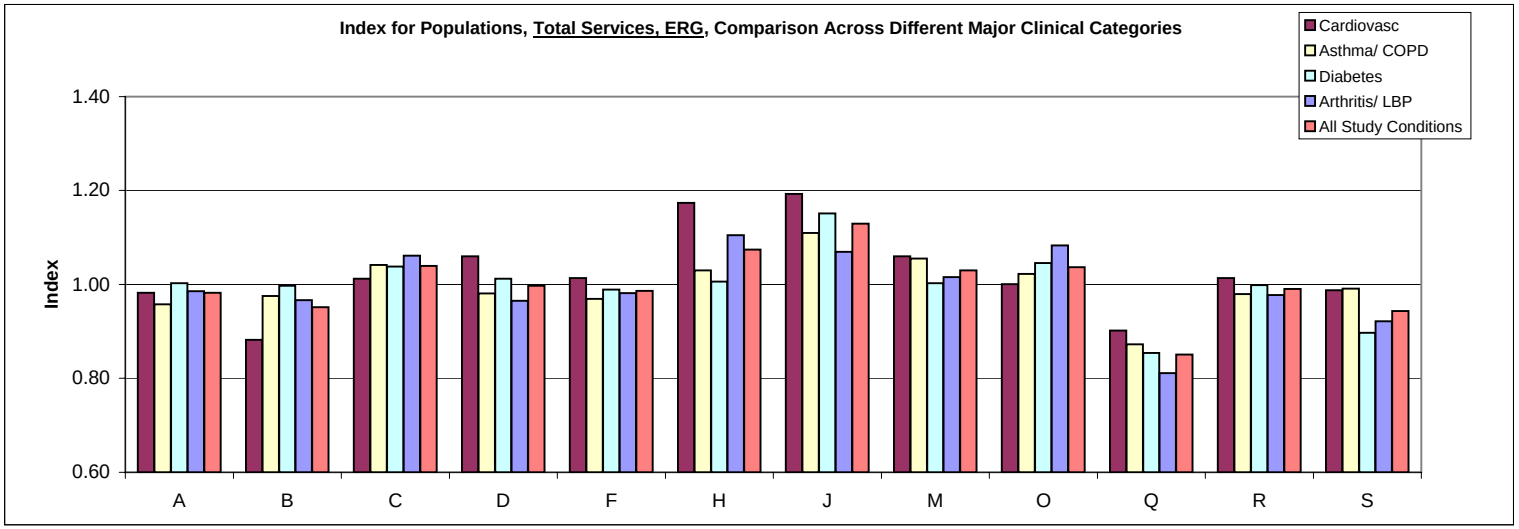
Index for total services excludes "Diagnostics","E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology". Patients exceeding $100,000 in total costs excluded from analysis.

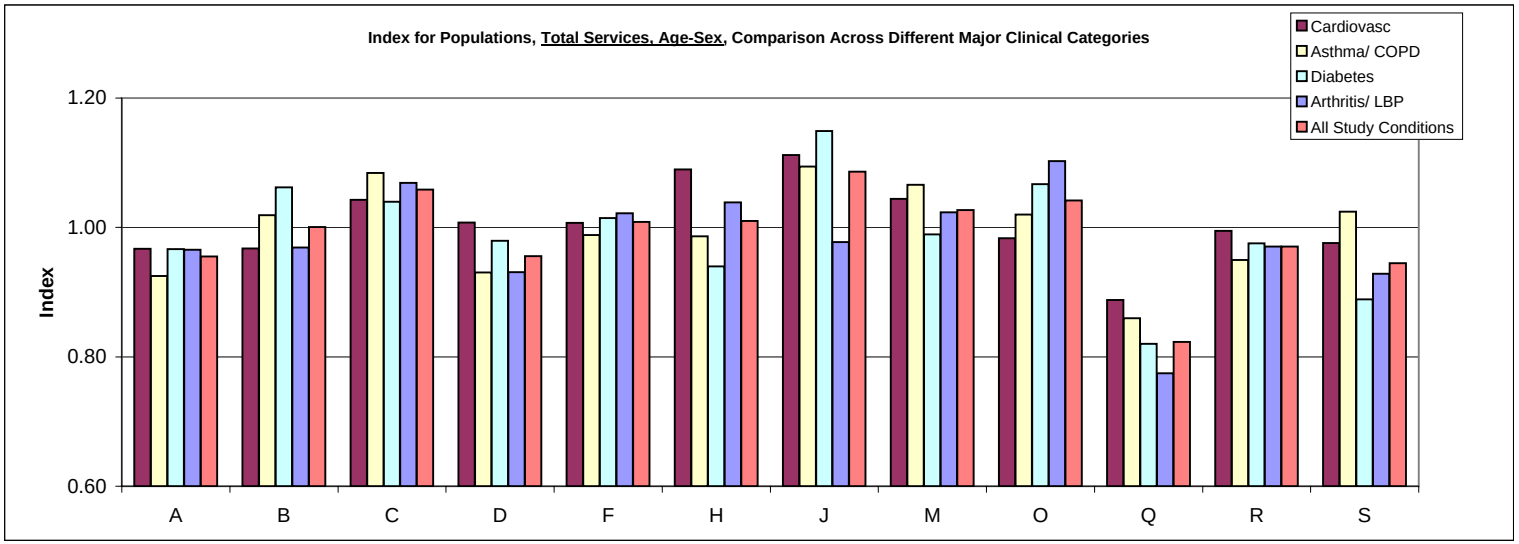
-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year. '-Pharmacy data used as part of the patient identification for Asthma and Diabetes.

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

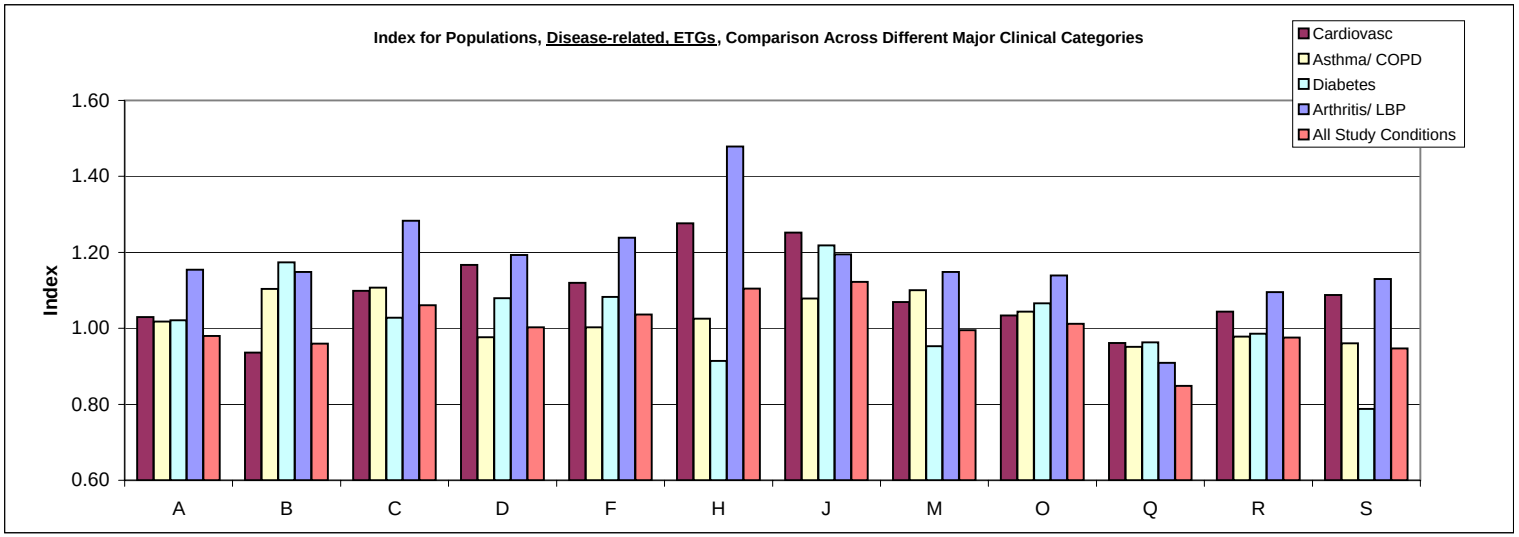
Table 9: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Measurement Approach, Across Major Clinical Categories

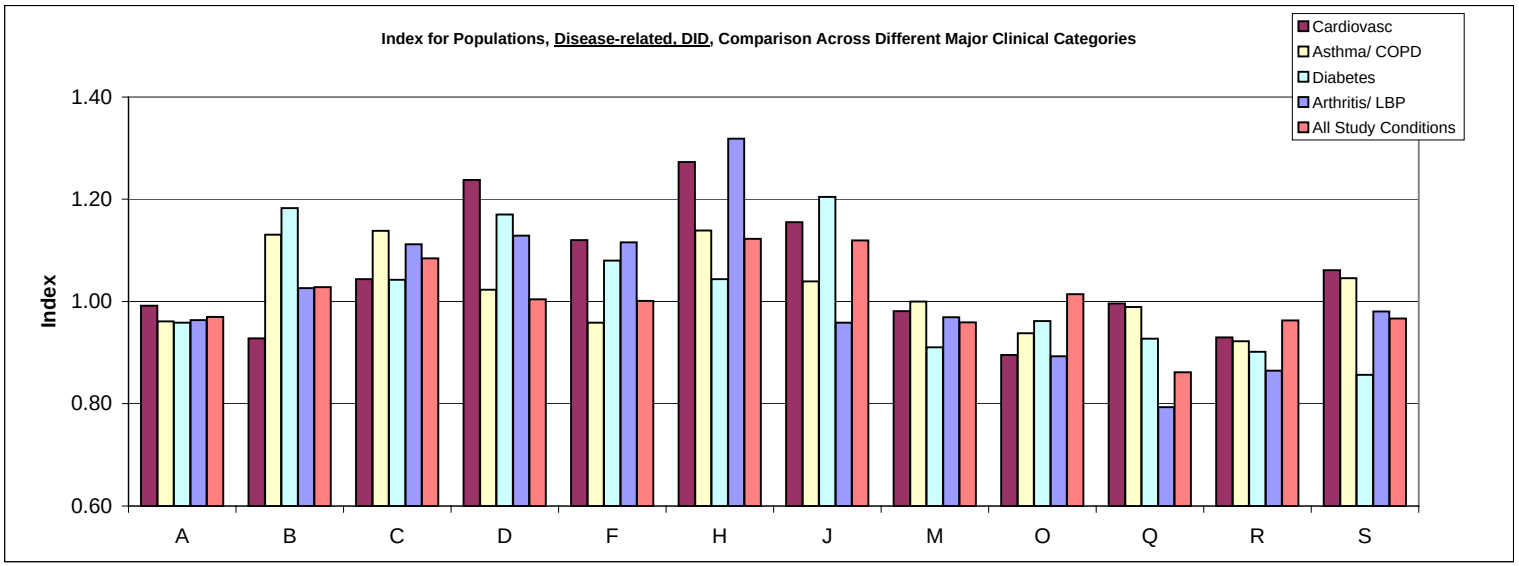




NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results for Presentation, 12/09/04

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
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).

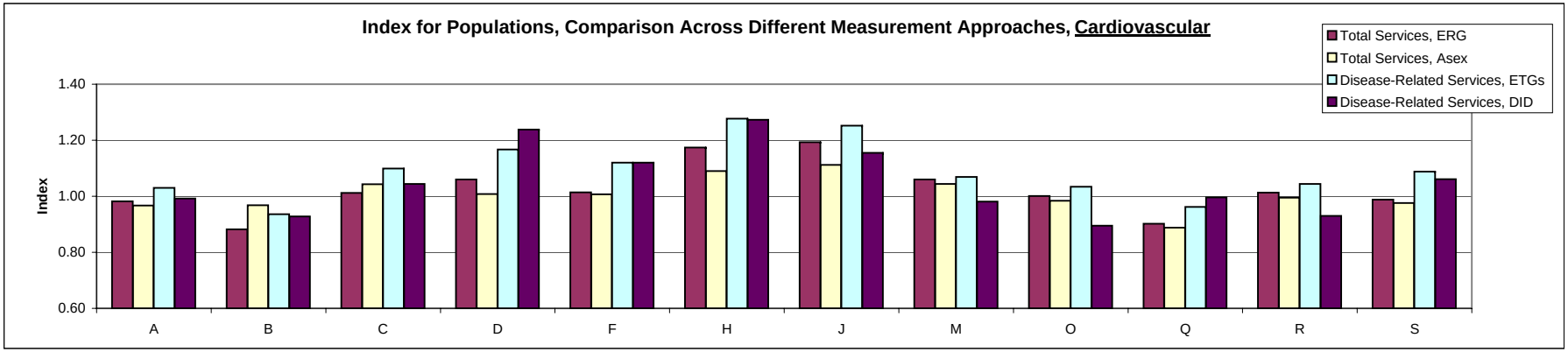
Index for total services excludes "Diagnostics","E & M (MH)", "Other", "Laboratory", "Phys Medicine", "Radiology". Patients exceeding $100,000 in total costs excluded from analysis.

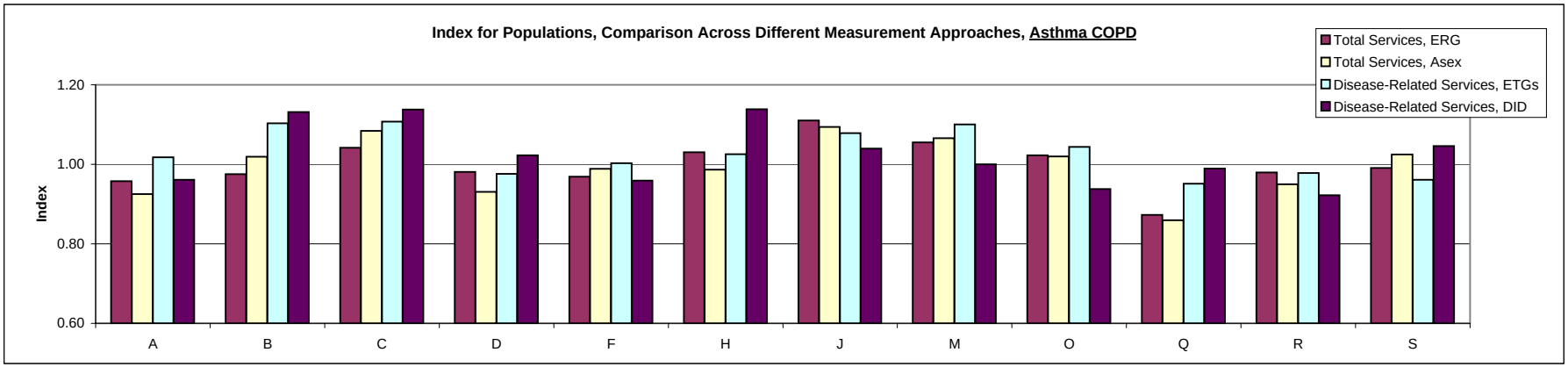
-Members identified with a condition in Year 2 with 6 or more member months enrolled during that year. '-Pharmacy data used as part of the patient identification for Asthma and Diabetes

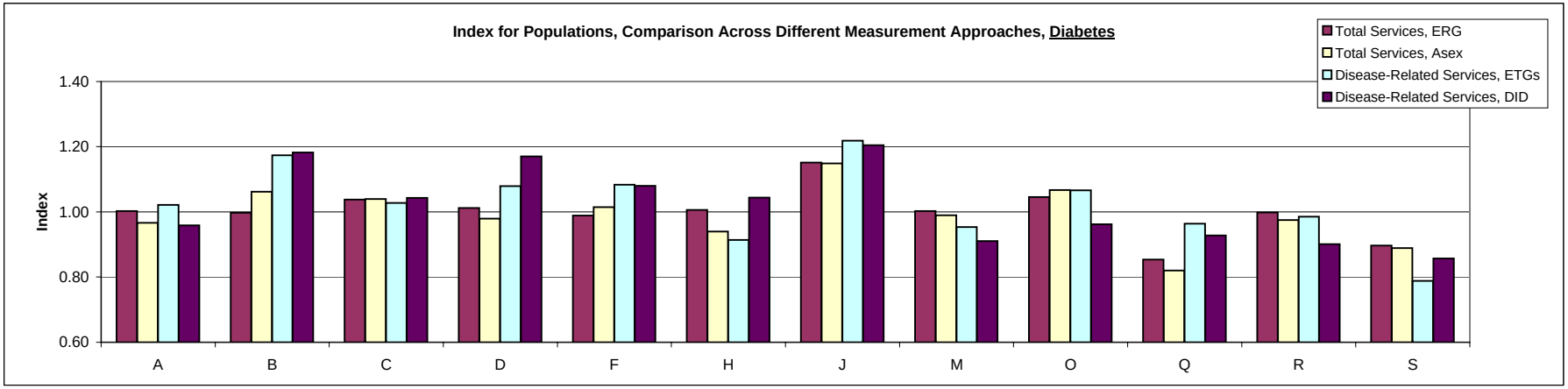
Standard deviation of index measures across populations is shown at the bottom of each column. This can be considered a measure of the variation in the index across populations.

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

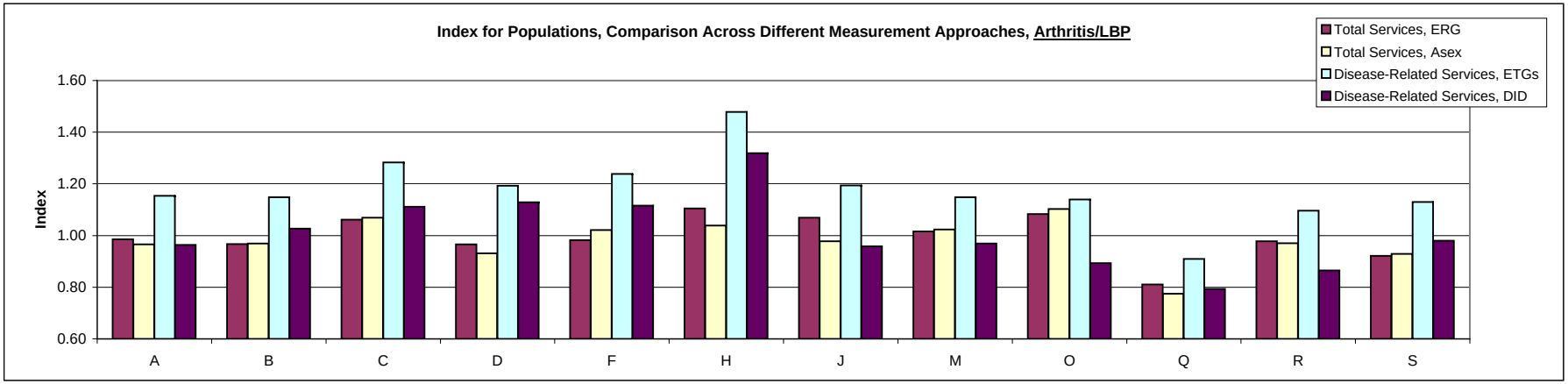


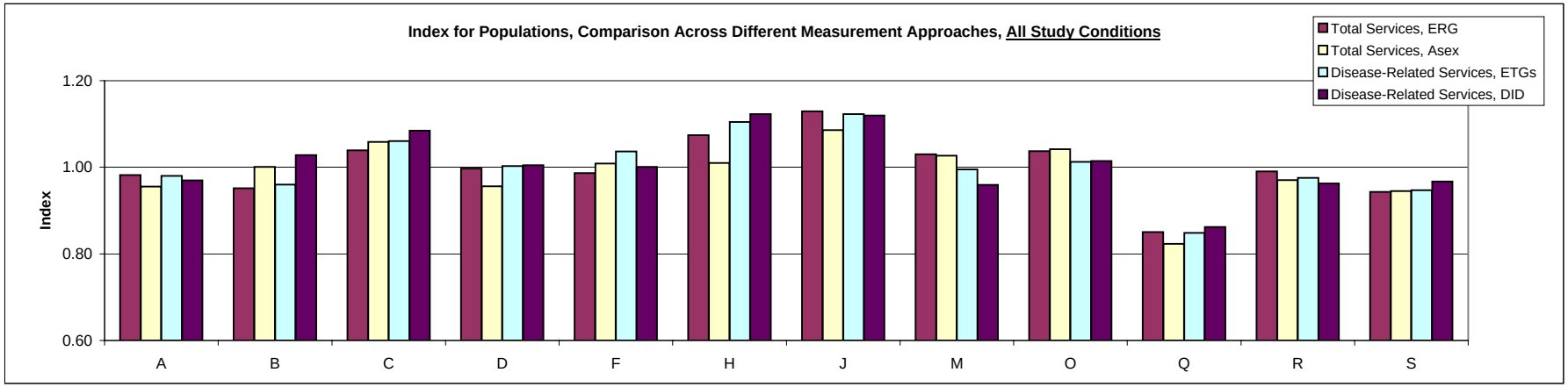




NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Final Results for Presentation, 12/09/04

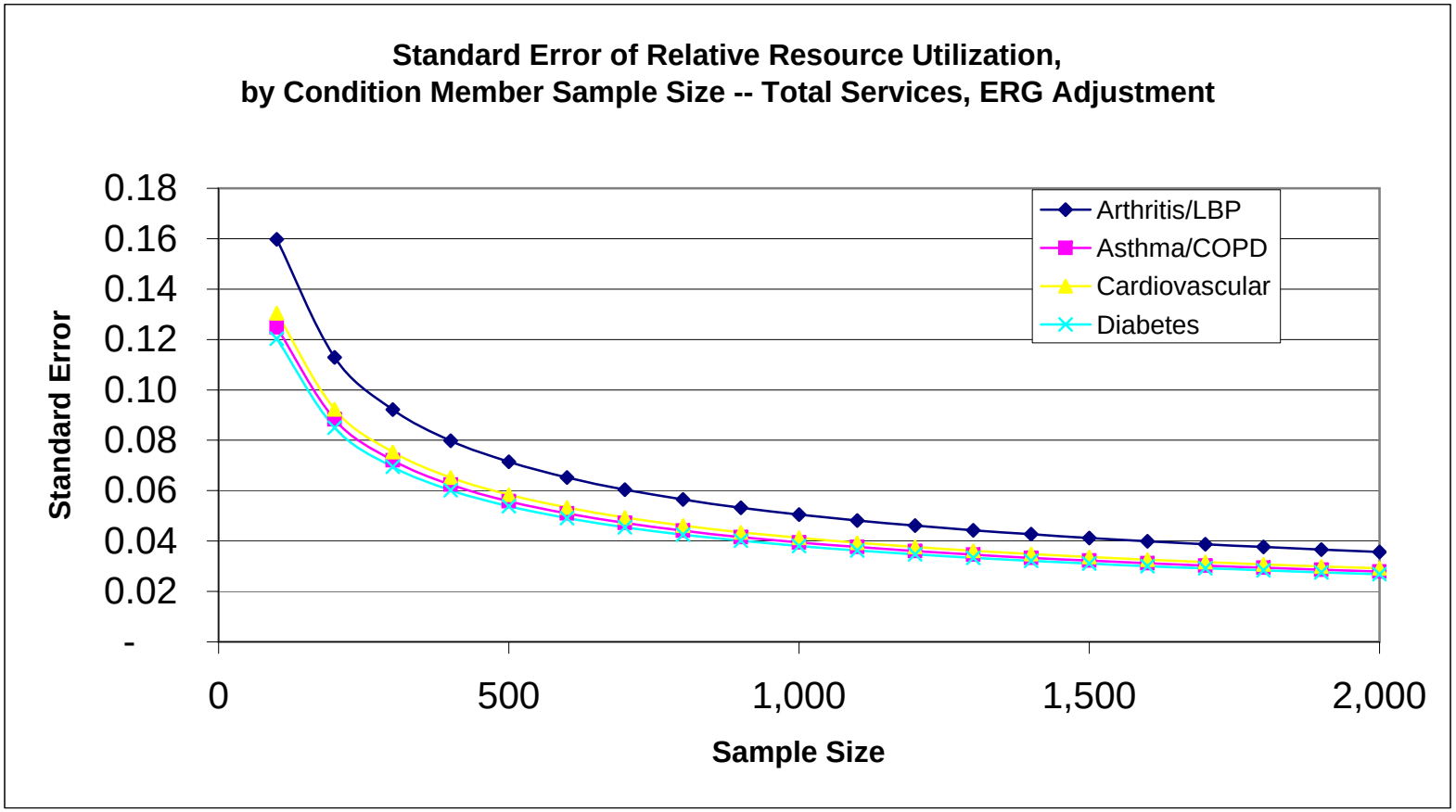
Table 10: Resource Consumption Index, Comparison of Results for Different Measurement Approaches, by Population and Major Clinical Category, including All Study Conditions and Diseases





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

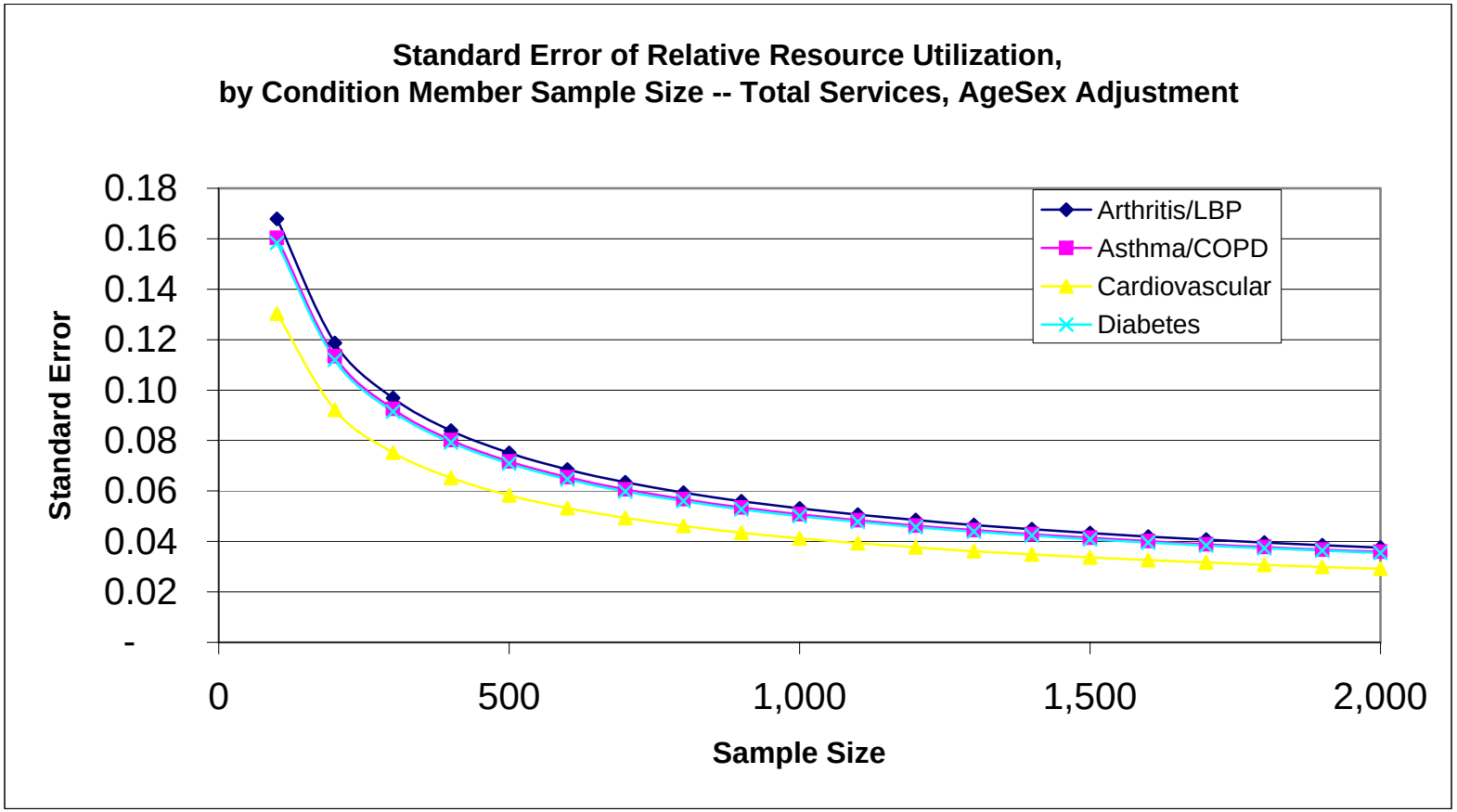
Table 11a: Sample Size and Standard Error, by Clinical Category
Total Costs*, Total Services, ERGs used for Risk Adjustment



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

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

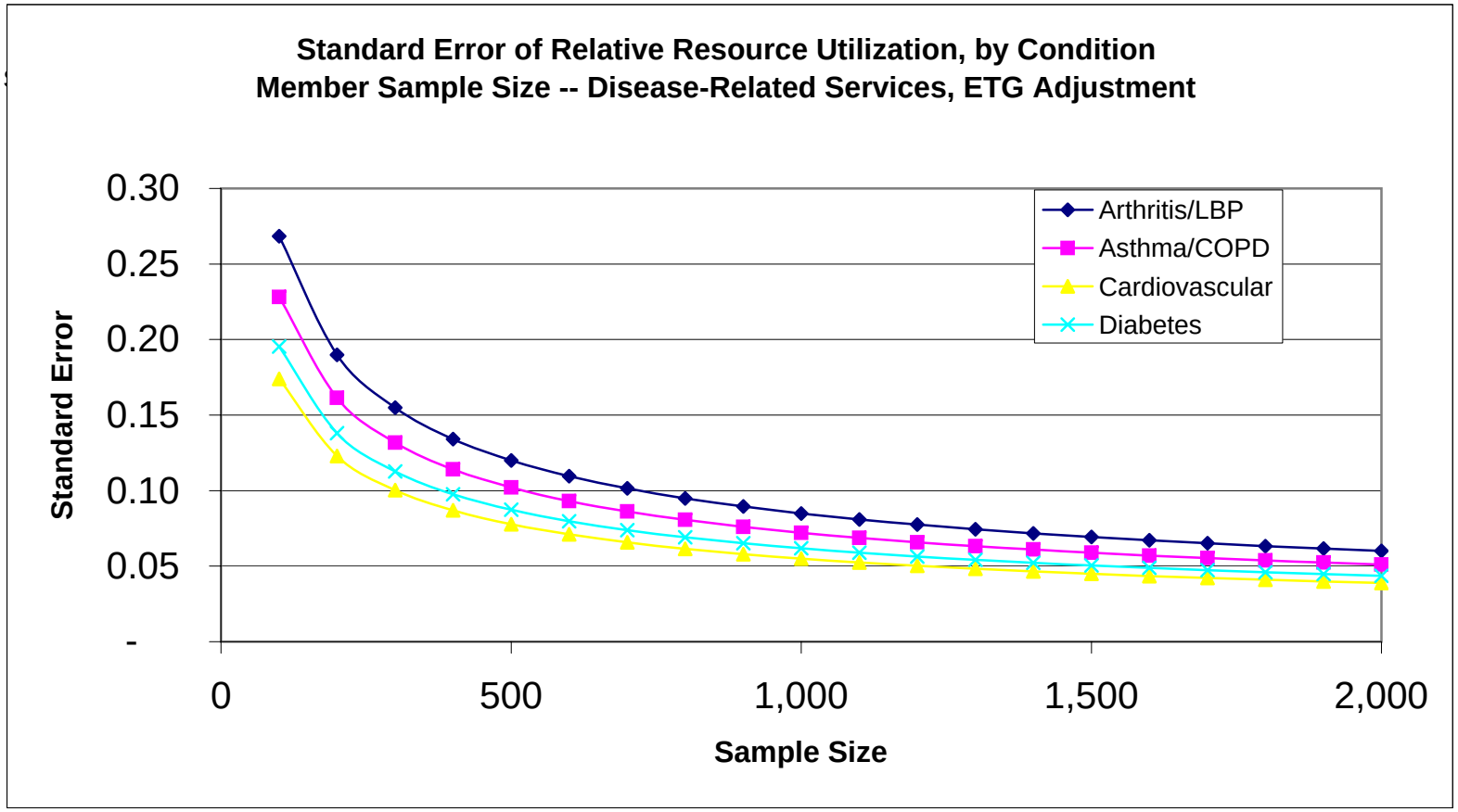
Table 11b: Sample Size and Standard Error, by Clinical Category
Total Costs*, Total Services, AgeSex used for Morbidity Adjustment



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

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

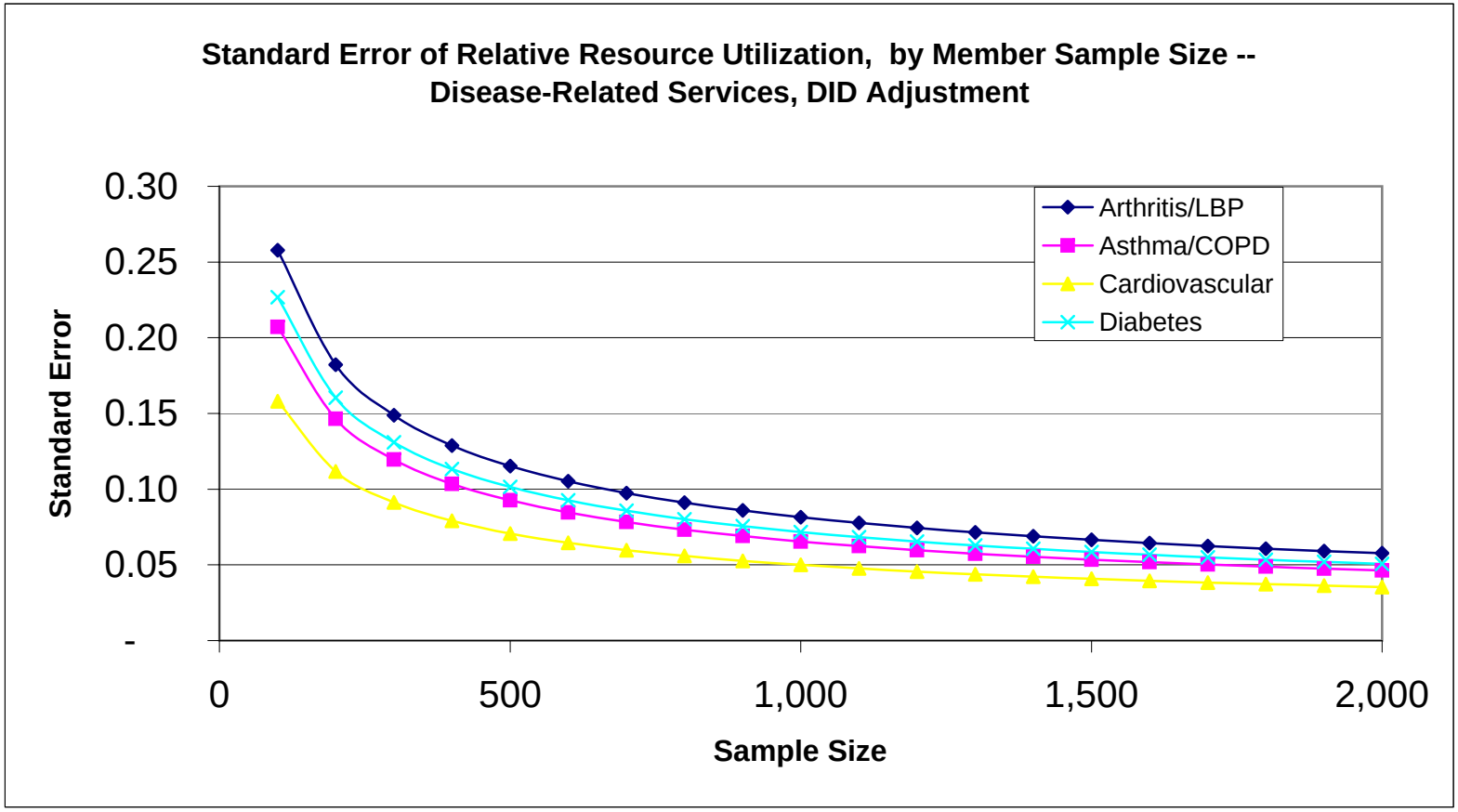
Table 11c: Sample Size and Standard Error, by Clinical Category
Total Costs*, Disease-Related Services, ETGs



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

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 Cateogry			
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

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.

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).

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

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.

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

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).

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

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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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
02 – risk score 1.00 to less than 2.00
03 – risk score 2.00 to less than 4.00
04 – risk score 4.00 to less than 8.00
05 – risk score 8.00 to less than 12.00
06 – risk score 12.00 to less than 15.00
07 – risk score 15.00 to less than 20.00
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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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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Episode Treatment Groups are proprietary to Symmetry Health Data Systems.

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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

	Rank Order Correlations for Total Services, ERG Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
Type of Service	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

	Rank Order Correlations for Total Services, AgeSex Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
Type of Service	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

	Rank Order Correlations for Disease-Related Services, ETG Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
Type of Service	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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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

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

	Rank Order Correlations for Disease-Related Services, DID Model Risk Adjustment									
	All Diseases		Arthritis/LBP		Asthma/COPD		Cardiovascular		Diabetes	
Type of Service	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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NCQA EMAP Field Test - Relative Resource Utilization for Selected Clinical Conditions
Appendix Table

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

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	0.62	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

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	0.51	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

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	0.48	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

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

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

Cardiovascular

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	0.63
ERG Total		1.00	0.61	0.94	0.88	0.97	0.84	0.95
Asex Total* (Selected)			1.00	0.69	0.85	0.62	0.73	0.55
Asex Total				1.00	0.92	0.97	0.87	0.94
ETG Total* (Selected)					1.00	0.91	0.94	0.88
ETG Total						1.00	0.87	0.99
DID Total* (Selected)							1.00	0.86
DID Total								1.00

Diabetes

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	0.63	0.54
ERG Total		1.00	0.16	0.89	0.24	0.87	0.23	0.79
Asex Total* (Selected)			1.00	0.48	0.80	0.38	0.93	0.55
Asex Total				1.00	0.62	0.91	0.56	0.94
ETG Total* (Selected)					1.00	0.60	0.91	0.71
ETG Total						1.00	0.49	0.86
DID Total* (Selected)							1.00	0.65
DID Total								1.00

- 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)

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Risk Adjustment Model, Measure Reliability and Validity Testing Assessment Worksheet

Information from Measure Evaluation

Measure Number and Name: Relative Resource Use for People with Diabetes (#1557)
Description:
Measure Developer: NCQA

Summary Assessment

The measure presented is Relative Resource Use for People with Cardiovascular Conditions. This measure is based on standard prices and includes all costs for treating people with diabetes whether they are related to the condition or not.

Reliability and validity of the measure have been established.

The measure is restricted to patients 18-75 years old and has been tested in Medicare, Medicaid and commercial populations ➔ it can be endorsed for use in commercial, Medicaid and Medicare populations.

The measure is submitted for implementation in:

- Group or Practice
- Health Plan
- Integrated Delivery System
- Population: Regional
- Population: National

Reliability (2a)

2a1. Is the measure well defined and precisely specified?

a) Measure clinical logic described? Yes _X__ No ___
b) Measure construction logic described? Yes _X__ No ___
c) Risk-adjustment methodology described? Yes _X__ No ___
d) Is the data derivation process described in sufficient detail for users to implement the measure?
   i. Target population and data sources identified
   ii. Measure specific target conditions and events identified
   iii. Data elements and outcome variable(s) clearly defined
   iv. Measurement windows, exclusions, risk adjustment methodology clearly defined and explained

a) The clinical logic is defined including the methods to identify the conditions and the time frames for identification and measurement.

b) The construction logic is also described. The conditions are identified during the year prior to the measurement year. Exclusions are applied and resource use calculated overall and for different lines of service using standard costs.

c) Yes. The risk adjustment methodology is based on CMS' Hierarchical Condition Categories (HCC).

d) Yes, users should be able to implement the method based on the information provided.

i. The target population is identified as patients with diabetes, 18-75 years as of the end of the measurement period. The data sources are identified as complete administrative data during the two year period of interest including demographic, clinical diagnoses and encounters and medical benefit information.

ii. The target condition is defined in terms of diagnoses or events. Condition-specific codes are provided. All events listed in the standard price tables are included. Criteria are given for when to excluded services, such as denied claims or invalid or missing information.

iii. The data elements are identified and a way of calculating standard costs for the different services is described.

iv. The measurement window consists of 2 years of observations: one for identification and one for measurement. Requirements for data completeness are given. Exclusions are defined in terms of age, coverage and other conditions: active cancer, ESRD, organ transplant and HIV/AIDS, polycystic ovaries or gestational or steroid induced diabetes. The risk adjustment methodology is also identified and explained.

2a2 Reliability Testing

Data Reliability

a) Was data reproducibility assessed?

There was no evidence of assessment of data reproducibility. However, the measure was tested in a large managed care database provided by Integrated Healthcare Information Services, Inc. (IHCIS). For commercial claims databases, it is presumed that the database vendors performed reliability assessments as part of their QA process.

Measure Score Reliability

a) Measure score reliability tested (signal-to-noise ratio analysis by means of ANOVA, Intra-class Correlation Coefficient or other means)

For this measure, it is important to ensure the reliability of the Relative Resource Use (RRU) units from which the standard costs are derived. The measure developers conduct annually an analysis of the RRUs submitted by Medicare, Medicaid and commercial plans. They verified that sufficient number of plans report across all the RRU measures and by the type of plan. They report that the O/E results remained stable over time. While this approach is probably sufficient to demonstrate reliability, it would have been preferable that the developers report that variability over time in RRUs at the individual plan level and specifically for the condition of interest.

Validity (2b)

2b1 Is there evidence presented that the measure specifications allow to demonstrate variations in resource use across providers and/ or population groups? Does the measure and risk-adjustment methodology address this variability allowing for fair comparisons?

2b2 Validity Testing

Data Elements

a) Has the data been compared to other authoritative data sources? (Other databases, literature, etc.)

No. The researchers performed a thorough evaluation of the methodology as compared to an episode-based approach but no comparison to other databases was found.

b) Data integrity checked? (e.g. Percent of missing values, missing diagnosis codes, inconsistent dates, range checks, etc.)

No evidence of checking for data integrity as there is no mention of any checks performed during measure development.

c) Is the data representative of the target population?

No. The database included commercial, Medicare and Medicaid populations but did not include enough regional variation.

Measure Score

a) Has the measure score validity been shown? (By correlating to another valid indicator, or showing that it produces different results when applied to subgroups known to have differences in resource use or by expert opinion or other methods)

Yes. The distribution of costs across different lines of services and different plans was analyzed using different methods: Episode Treatment Groups and a methodology that included only disease-related costs in order to investigate if services that could be measured more reliably could account for the majority of costs. As expected, the majority of costs were attributable to prescriptions except for Type I diabetes with comorbidities, where the inpatient costs were larger. For both types of diabetes, the presence of comorbidities increased total costs significantly, specially for inpatient stays. The analysis also compared the standard errors of the total relative resource use and found it comparable to those of episode-based approaches such as ETGs for all sample sizes. The rank correlation of ETGs and RRUs was also very high.

2b3 Are exclusions supported by clinical evidence?

a) Has a sensitivity analysis been performed of the measure with and without the exclusions in terms of distribution of the outcome and number of patients affected?

This analysis was not performed

b) Are the reasons for exclusions properly addressed?

The reasons for exclusions are not addressed.

c) Are any of the exclusions based on patient preferences?

No

2b4 Is the measure risk-adjusted? If not, is there a rationale that supports no risk-adjustment/risk stratification?

a) Is the risk-adjustment methodology described completely and accurately?

Yes. The methodology is based on CMS's Hierarchical Condition Categories The steps to identify the members risk score and risk reporting category are detailed in S10.1

b) If a statistical model was used, is it appropriate for the problem at hand?

N/A

c) Candidate and final variable selection adequately described

N/A

d) Summary indicators of model fit, calibration and discrimination if appropriate provided

N/A

e) Risk factors identified make clinical/practical sense

N/A

f) Missing data/imputation methodology explained.

None used.

g) The model validates when applied to a new dataset (i.e., no overfitting)

N/A

h) How are influential observations handled?

The standard costs are truncated at set amounts (different for different lines of service)

2b5 Risk factors identified are associated with statistically significant and clinically meaningful differences

a) Are issues of statistical vs. practical significance addressed?

N/A

2b6 Demonstration that the method produces comparable results in different data sources

a) Does the method produce expected results when applied to different databases accounting for the differences in databases (e.g., an option to use administrative **or** medical record data)?

The method performance in different data sources was not analyzed.

2c Are identified disparities in care being used as risk factors?

Factors that identify groups with differences/inequalities in care (race, socioeconomic status, gender, etc.) should not be part of the risk-adjustment methodology

Age and gender appear to be part of the risk adjustment methodology.

Other comments:

Reviewer: Carlos Alzola