NATIONAL
QUALITY FORUM

TO: Expert Panel on Risk Adjustment and SES
FR: Karen Pace and Suzanne Theberge
SU: Briefing for project and conference call 12/9/13
DA: December 3, 2013

This memo provides information on the Risk Adjustment and SES Project and the upcoming call on December 9. The memo outlines the key topics, issues, and questions that the Expert Panel will need to address.

Actions

- Review the memo (p. 1-10).
- As you read this memo, keep in mind these questions:
    - Are there additional topics or key questions that the Expert Panel should address?
    - Is there an issue or question for which you can contribute to a panel presentation at the in-person meeting?
    - Are there specific references that should be added to the reference materials (see appendix) to help inform the committee's deliberations?

Contents

Agenda for Call on December 9

Risk Adjustment and Socioeconomic Status
Expert Panel Call: Orientation
December 9, 2013
1:00 – 3:00 pm ET

The purpose of this call is to:

- orient the Expert Panel to NQF and the project;
- begin discussion of key questions; and
- plan for the January in-person meeting.

Please use the following information to access the conference call line and webinar:

Speaker dial-in #: (888) 799-5160
Confirmation Code: 72452188

Weblink: http://nqf.commpartners.com/se/Rd/Mt.aspx?464766

AGENDA

1:00 pm	**Welcome, Purpose of the Call, Agenda** *Karen Beckman Pace, PhD, MSN, Senior Director* *Suzanne Theberge, MPH, Project Manager*
1:05	**Expert Panel Introductions** *Kevin Fiscella, MD, MPH, Co-chair* *David Nerenz, PhD, Co-chair*
1:25	**Brief Introduction to NQF and Project Overview** *Suzanne Theberge*
1:45	**Project Goals and Approach** *Karen Pace*
2:00	**Discussion of Topics and Key Questions** *Kevin Fiscella, David Nerenz, and Expert Panel*
2:45	**Public Comment**
2:55	**Next Steps** *Suzanne Theberge & Karen Pace*
3:00 pm	**Adjourn**

Project on Risk Adjustment and SES

Purpose

The purpose of this project is to:

- Identify and examine the issues related to risk adjusting outcome and resource use performance measures for socioeconomic status (SES) or other sociodemographic factors such as race/ethnicity.
- Make recommendations regarding if, when, and how outcome and resource use performance measures should be adjusted for SES or other sociodemographic factors. Make recommendations for NQF's endorsement criteria for outcome performance measures.

Approach

A multistakeholder Expert Panel with a variety of experience related to outcome performance measurement and disparities will review the issues and make specific recommendations regarding the inclusion of SES or other sociodemographic variables in risk adjustment models for outcome performance measures. The expert panel's recommendations will be posted for public comment and final recommendations will be submitted for approval by the Consensus Standards Approval Committee (CSAC) and Board of Directors.

In-person meeting

The in-person meeting will provide an opportunity for the Expert panel to discuss the issues and draft recommendations. The meeting will be organized to include:

- Panel presentations by some Expert Panel members on the topic areas and questions identified in this document or on the 12/9 call, followed by
- Panel discussion to answer the key questions and draft recommendations.

Definitions

The following definitions will be used to facilitate common understanding.

Accountability Applications – Use of performance results about identifiable, accountable entities to make judgments and decisions as a consequence of performance, such as reward, recognition, punishment, payment, or selection (e.g., public reporting, accreditation, licensure, professional certification, health information technology incentives, performance-based payment, network inclusion/exclusion).[1]

Health Disparity – Healthy People 2020 defines a health disparity as "a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion."

Healthcare disparity – Racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs.[2]

Outcome – the result of providing healthcare. ***Throughout this document, the term outcome will be used to broadly include the following types of outcomes:***

- Quality outcomes include:
  - Health outcome is the health status of a patient (or change in health status) resulting from healthcare—desirable or adverse.
  - In some situations, resource use may be considered a proxy for a health state (e.g., hospitalization may represent deterioration in health status).
  - Intermediate clinical outcome is a change in physiologic state that leads to a longer-term health outcome (e.g., hemoglobin, blood pressure).
  - Patient-reported outcome is any report of the status of a patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else. The domains of PROs include health-related quality of life/functional status, symptom/symptom burden, experience with care, and health-related behaviors.[3]
- Economic outcomes include the cost and resource use associated with providing healthcare services. (Although efficiency is considered one aspect of quality, cost and resource use alone without consideration of quality is not considered a quality performance measure.)

Performance measure – Numeric quantification of healthcare quality for a designated accountable entity such as hospital, health plan, nursing home, clinician, etc. (NQF measure testing report)

Risk Adjustment – The process of controlling or accounting for patient-related factors before examining outcomes of care, regardless of context.[4]

Social Determinants of Health – Healthy People 2020 defines social determinants of health as conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. Conditions (e.g., social, economic, and physical) in these various environments and settings (e.g., school, church, workplace, and neighborhood) have been referred to as "place." In addition to the more material attributes of "place," the patterns of social engagement and sense of security and well-being are also affected by where people live. Resources that enhance quality of life can have a significant influence on population health outcomes. Examples of these resources include safe and affordable housing, access to education, public safety, availability of healthy foods, local emergency/health services, and environments free of life-threatening toxins.

Sociodemographic – Broad term referring to demographic and socioeconomic factors.

Socioeconomic Status – Broadly conceptualized as one's position in the social structure that encompasses the notions of class, status, and power.[5] Socioeconomic status has traditionally been defined and measured by education, income, and occupation.[6]

Background

Outcomes as defined above are considered important for performance measurement because they often are the reasons for seeking and providing healthcare (e.g., to survive, improve or maintain function, relieve distressing symptoms) and are integrative of all care received. NQF endorses performance measures that are suitable for both performance improvement and accountability applications as demonstrated by meeting a standard set of evaluation criteria. Because outcomes can be influenced by factors other than the healthcare received, the criteria for validity include risk adjustment for “patient factors that influence the measured outcome (but not factors related to disparities in care or the quality of care) and are present at start of care”. Current NQF guidance indicates that factors related to disparities, such as SES and race, should not be included in risk models; rather outcome measures should be stratified by such factors. However, specific guidance for stratification has not been developed and examples of such stratification in accountability applications have not been identified.

Endorsement of outcome performance measures for use in accountability applications has become increasingly controversial over the issue of adjusting outcome performance measures for patients’ socioeconomic (SES). Recent examples are #1789: Hospital-wide all-cause unplanned readmission (See the Readmissions Project, section titled Candidate Consensus Standards Review) and #2158-Medicare Spending per Beneficiary Measure (MSBP) (See Cost and Resource Use Phase 1, section titled Pre-Meeting Member Comment, Phase 1). Risk adjusting outcome performance measures to account for differences in patient health status and clinical factors (e.g., co-morbidities, severity of illness) present at the start of care is widely accepted; however, adjusting for SES is more controversial. Although the impact of SES on health and healthcare has been well-documented, [2, 7, 8] there are at least two divergent views regarding SES in risk adjustment models for outcome performance measures:

1) adjusting for SES is necessary for fair comparisons of providers, particularly those who care for disadvantaged populations because the effect of SES is beyond the control and responsibility of the healthcare system, and
2) adjusting for SES should not be done because it obscures disparities and implies that differences in outcomes based on SES are expected and accepted.

Assumptions, Values, Core Principles

Although sound methods, data, and evidence provide the foundation, the question of whether to risk adjust outcomes for SES is more than a methodological or evidence problem. Perspectives on risk adjusting outcome performance measures for SES or other sociodemographic factors may be influenced by competing priorities and various assumptions, values, or biases. Identifying and openly discussing various perspectives will be essential to achieving the project goals. Being mindful of different assumptions and values will also be useful to recognizing potential unintended consequences of potential recommendations.

Core Principles

In order to reach agreement on recommendations, it will be important to first identify some core principles to provide a common ground for the Expert Panel’s deliberations. The core principles can be reviewed as needed if the Panel reaches an impasse in making recommendations. The principles are not intended to imply a particular direction for recommendations related to risk adjustment for SES; rather they should represent a baseline of agreement on the key issues that must be considered in making recommendations. Some core principles on which there seems to be widespread agreement are:

- Outcomes may be influenced by health status and sociodemographic patient factors in addition to healthcare services, treatments and interventions.
- Outcome performance measures need to be risk-adjusted to make fair comparisons of provider performance for accountability applications. (Note that this statement does not identify which risk factors are appropriate.)
- Disparities in health and healthcare should be identified and reduced.

Key Questions

- Does the Expert Panel agree with the core principles listed above?
- At the in-person meeting, Expert Panel members will be asked to share their current perspective on the topic of including SES or other sociodemographic factors for risk adjusting outcome performance measures and then suspend judgment until the issues are fully examined.
    - What are the explicit or implicit assumptions and values?

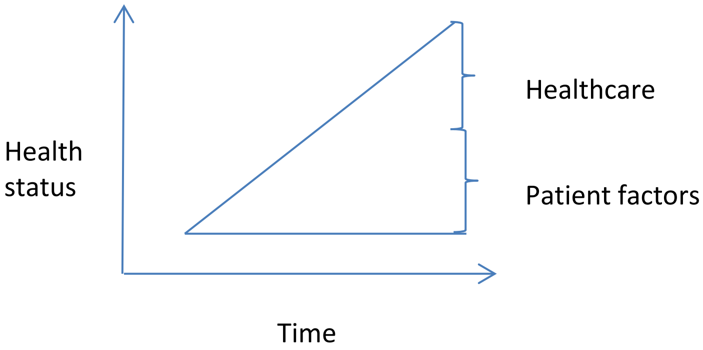
Outcome Performance Measures

Outcome performance measures aggregate the data on individual patient outcomes for the accountable entity (e.g., hospital, clinician, nursing home). Outcomes generally are a function of several inputs including patient factors, treatment effectiveness, quality of care, and random events. This can be represented as an equation:

Outcomes = *f* (intrinsic patient factors, treatment effectiveness, quality of care, random chance) [4, p. 5]

Outcomes often represent a change in some health status indicator (e.g., function, pain) over time; that change can be due to both healthcare and patient factors as represented in Figure 1.

Figure 1. Outcome as a Change Over Time



The ultimate goal of performance measurement is to facilitate improvement in healthcare and health. Measurement is used to identify differences in quality of healthcare and identify opportunities for improvement. Unlike many process performance measures, which are focused on care practices that should be delivered to all patients in a specified target population, the goal for outcome performance may not be 100% (or 0%). Due to the limits of science, not all patients will achieve the outcome (e.g., survive), and the "right" rate may not be known. Consequently, it is through comparison across providers that opportunities for improvement are identified. Providers with superior risk-adjusted outcomes set the goal for what is possible to achieve. In order for performance results to be meaningful and valid for identifying differences in performance across providers, outcome performance measures must be adjusted for different levels of risk in the patients served.

Risk Factors

Iezzoni [4, p. 31] identified the major categories for the potential patient factors that may influence outcomes to include the following. This is not a comprehensive list and concepts may overlap. Additionally, not all factors may affect every outcome.

- Genetics (e.g., predisposition to conditions or health-related behaviors)
- Demographic characteristics (e.g., age, sex, race, ethnicity, primary language)
- Clinical factors (diagnoses, conditions and severity; physiologic stability; physical, mental, cognitive function)
- Psychosocial factors, socioeconomic, and environmental factors (e.g., family, education, occupation, economic resources, health insurance, neighborhood)
- Health-related behaviors and activities (tobacco, diet, physical activity)
- Quality of life, attitudes, and perceptions (health-related quality of life and overall health status; preferences; cultural, religious beliefs and behavior)

The final selection of patient factors for risk adjustment of outcome performance measures involves both conceptual and empirical considerations such as the following.

- Clinical/conceptual relationship with the outcome of interest
- Empirical association with the outcome of interest
- Contribution of unique variation (i.e., not redundant or highly correlated with another risk factor)
- Not confounded with quality of care – risk factors should be present at the start of care
- Resistant to manipulation or gaming – generally, a diagnosis or assessment data (e.g., functional status score) is considered less susceptible to manipulation than a clinical procedure or treatment (e.g., physical therapy service).
- Accurate data that can be reliably captured – data limitations often represent a practical constraint to what factors are included in risk models.
- Improvement in risk model metrics (e.g., discrimination, calibration) and sustained with cross-validation

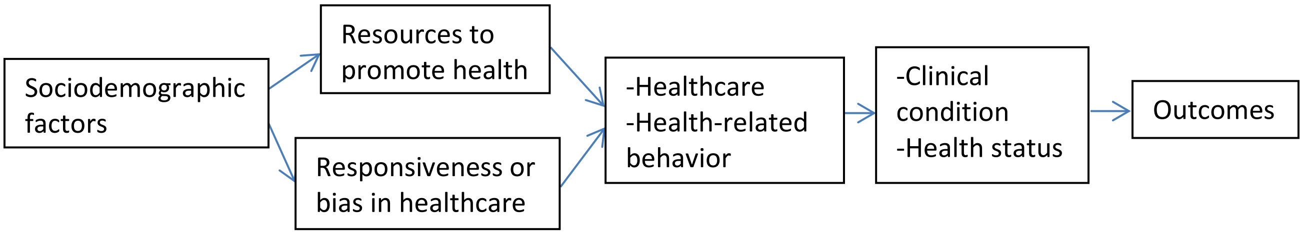
Sociodemographic Factors

The term *sociodemographic* will be used to include a variety of socioeconomic (e.g., income, education, occupation) and demographic factors (age, race, ethnicity, primary language). A substantial body of research has found that health and healthcare are influenced by a variety of demographic and socioeconomic factors.[2, 7, 8] Based on the considerations for selecting risk factors noted above, sociodemographic factors could be eligible for inclusion in a risk adjustment model. The primary caution stems from their association with disparities in health and healthcare for certain population subgroups and potential confounding with quality of care. Including them in risk adjustment models carries the implicit assumption that poorer outcomes are expected in disadvantaged populations and that healthcare providers are not expected to change practices to reduce disparities.[9, 10]

The mechanism(s) for the effect of sociodemographic factors on health status and outcomes may not always be clear, but some possibilities are depicted in the simplified pathways depicted in Figure 2.[6, 11] Although creating a definitive causal pathway is beyond the scope of this project, the mechanisms may have implications for potential recommendations. For example, rather than SES, are there more proximal variables that directly affect outcomes? Or if SES affects health status and clinical conditions, is including those variables sufficient?

One potential mechanism is that sociodemographic factors such as income, education, and health literacy could affect the availability of resources to promote or maintain health (e.g., knowledge of health promotion or how to manage self-care, insurance coverage, ability to pay for non-covered healthcare expenses, access to a usual source of care). Another potential and simultaneous mechanism may be the implicit biases or assumptions on the part of healthcare providers that influence their interactions with, and the care options given to, patients with different characteristics (e.g., race/ethnicity), thus increasing the likelihood of receiving substandard care. The characteristics associated with being disadvantaged (e.g., low SES) are generally associated with less than optimal outcomes. However, for resource use and cost, the relationship could vary (e.g., depending on timing and the population included cost and resource use could be less because of inability to access preventive and early diagnostic services). Something not portrayed in these simplified pathways is the potential impact of health status and clinical conditions on sociodemographic factors, particularly on income and occupation. Regardless of the mechanism, reducing disparities is a national priority and requires the ability to measure those disparities.

Figure 2. Sociodemographic Factors and Outcomes



Key Questions

- Although creating a definitive causal pathway is beyond the scope of this project, the mechanisms may have implications for potential recommendations.
  - Are there additional mechanisms that have implications for risk adjustment?
  - Do demographic factors of age, sex, and race represent intrinsic biologic or physiologic differences that directly affect clinical condition and health status?
  - Are there differences based on the type of outcome?
- To what extent will including clinical and health status factors (e.g., co-morbidity, health status, severity of illness) in the risk model account for the effect of the sociodemographic variables?
  - What are the relationships (redundancy) between and among SES, race/ethnicity, and the clinical and health status factors that are already captured in risk models?
  - If age, clinical factors, and health status are in the model, does adding SES explain additional variation in the outcome?
  - If sociodemographic factors lead to less use of healthcare services, would data exist on health status and clinical conditions prior to the start of care?
- Do all providers serving disadvantaged populations invariably have poorer outcome performance scores than providers serving average or more advantaged populations?
  - Can practices/ interventions moderate or mitigate the influence of sociodemographic factors on outcomes? (e.g., providing instructions in different languages, interpreters; prescribing generic vs. higher-cost brand name drugs; case managers/care navigators; post-hospital follow-up clinics)

    - Are healthcare providers responsible for adjusting care practices based on sociodemographic factors?
    - What are the implications related to the question of risk adjustment for sociodemographic factors?
    - Are there differences based on the type of outcome?

Use of Outcome Performance Measures in Accountability Applications

NQF-endorsed performance measures are expected to be used in accountability applications. The NQF criteria currently do not differentiate between accountability applications (e.g., public reporting vs. pay for performance) and require all performance measures demonstrate reliability and validity so that accurate conclusions about the quality of care can be made. Risk adjustment is essential for making valid conclusions and fair comparisons on outcome performance across providers and must be addressed.

NQF criteria and endorsement do not include requirements and evaluation of procedures for implementation and reporting of the computed performance measure score (e.g., reporting with or without confidence intervals or sample sizes; methods for determining rankings or ratings, statistically significant differences, or incentives and penalties). However, some of the methods applied after performance measure score is computed could affect the validity of the conclusions.

Increasingly, concerns have been expressed about the policy response to outcome performance results. For example, if providers serving disadvantage populations have poorer outcome performance and incur financial penalties, it may worsen disparities in health and healthcare.

Key Questions

- Do different accountability applications require different expectations for reliability, validity, and risk adjustment?
- What are the implications related to the question of risk adjustment for sociodemographic factors?

Methodological Considerations

Common methods for risk adjustment include:[4]

- Stratification of outcome results for patients in different risk categories within each accountable entity
- Comparison of observed to expected outcomes for the accountable entity
    - Indirect standardization where the expected number of outcomes are determined by applying stratum-specific rates determined from all patients to the number of cases in each stratum for each provider
    - Extension to multivariable statistical models
- Direct standardization where provider-specific rates are computed in each risk stratum and applied to the "standard" population case mix, producing an estimate of what might be expected if the provider were to treat the standard patient mix

When assessing risk models used for outcome performance measures, the metrics such as C-statistic or R-squared are not necessarily expected to achieve the same values as models that include and are intended to explain the contribution of all variables that influence the outcome. In risk models, the independent variables are limited to patient risk factors. Variables related to care processes or structures are purposely not included so that differences in risk-adjusted outcome rates can be attributed to differences in quality.

Statistical modeling to estimate the provider score on the outcome involves choosing from among a variety of options including:

- Random effects with shrinkage estimators vs. fixed effects
- Shrinking toward the overall average or some other benchmark (e.g., average of “like” providers
- Hierarchical models
- Bayesian analysis

The various methods may have different trade-offs and policy implications. For example, fixed effects models identify more outliers, some of which will be false positives; whereas, random effects models identify fewer outliers, some of which will be false negatives.[12]

Data

As previously mentioned, data limitations constrain what can be included in risk models. Sociodemographic factors other than age and sex often are not available, or not standardized sufficiently for use in performance measurement.[13] Therefore, if these factors should be included in risk models, data availability is a critical consideration.

Patient- or Aggregate-Level Factors

Typically, risk models include patient factors. However, an alternative might be to focus on the accountable entity being measured (e.g., proportion of low-income or minority patients served by a hospital) or the community (e.g., average income, healthcare resources available). These aggregate level characteristics could be included in statistical models to determine the benchmark group for a shrinkage estimator, or as a hospital characteristic in a hierarchical model, or used to construct peer groups for comparisons.

MedPAC[14] recently proposed a method specifically related to SES and hospital readmission rates is to create comparison groups for hospitals based on the proportion of low income individuals served. Readmission rates would be risk-adjusted based on clinical and health status factors, but for purposes of accountability, hospital performance would be compared to similar hospitals in terms of proportion of low income individuals in their case mix.

Key Questions

- If adjustment for sociodemographic factors is recommended, what options should be considered?
- What are the pros and cons of each option including potential unintended consequences?
- Are there differences by type of outcome or use of the performance measure?

References

1. National Quality Forum, *Guidance for Evaluating Usability and Use of Performance Measures,* Washington, DC: NQF; 2012. Available at http://www.qualityforum.org/docs/measure_evaluation_criteria.aspx.
2. IOM Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care,* Washington, DC: The National Academies Press; 2003.
3. National Quality Forum, *Patient Reported Outcomes (PROs)in Performance Measurement,* Washington, DC: NQF; 2013. Available at http://www.qualityforum.org/Projects/n-r/Patient-Reported_Outcomes/Patient-Reported_Outcomes.aspx.
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7. Agency for Healthcare Research and Quality (AHRQ), *2012 National Health Care Disparities Report,* Washington, DC: AHRQ; 2013. Report No.: 13-0003. Available at http://www.ahrq.gov/research/findings/nhqrdr/index.html.
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12. Austin PC, Alter DA, Tu JV, The use of fixed- and random-effects models for classifying hospitals as mortality outliers: a Monte Carlo assessment, *Med Decis Making,* 2003;23(6):526-539.
13. Weissman JS, Stern RS, Epstein AM, The impact of patient socioeconomic status and other social factors on readmission: a prospective study in four Massachusetts hospitals, *Inquiry,* 1994;31(2):163-172.
14. Medicare Payment Advisory Commission (MedPAC), *Refining the Hospital Readmissions Reduction Program,* Washington, DC: MedPAC; 2013. Available at http://www.medpac.gov/.

Appendix—Annotated Reference List

The following list of reference materials includes key reports and some individual articles that address the main topics of disparities, sociodemographic factors effect on outcomes, and examples of outcome performance measures; it is not intended to be a comprehensive review of the literature.

Key Question

- Are there specific references that should be added to the reference materials to help inform the committee's deliberations?

Agency for Healthcare Research and Quality (AHRQ), *2012 National Health Care Disparities Report,* Washington, DC: AHRQ; 2013. Report No.: 13-0003. Available at http://www.ahrq.gov/research/findings/nhqrdr/index.html.
Abstract: For the tenth year in a row, the Agency for Healthcare Research and Quality (AHRQ) has produced the National Healthcare Quality Report (NHQR) and the National Healthcare Disparities Report (NHDR). These reports measure trends in effectiveness of care, patient safety, timeliness of care, patient centeredness, and efficiency of care. New this year are chapters on care coordination, health system infrastructure. The reports present, in chart form, the latest available findings on quality of and access to health care. The National Healthcare Quality Report tracks the health care system through quality measures, such as the percentage of heart attack patients who received recommended care when they reached the hospital or the percentage of children who received recommended vaccinations. The National Healthcare Disparities Report summarizes health care quality and access among various racial, ethnic, and income groups and other priority populations, such as residents of rural areas and people with disabilities.

Andersen R, Newman JF, Societal and individual determinants of medical care utilization in the United States, *Milbank Mem Fund Q Health Soc,* 1973;51(1):95-124.

Andersen RM, Rice TH, Kominski GF, Improving Access to Care in American: Individual and Contextual Indicators, In: Andersen RM DP, editor, *Changing the US Health Care System: Key Issues in Health Services Policy and Management,*San Francisco, CA: Jossey-Bass; 2007.
Abstract: This chapter presents basic trends as well as research and policy issues related to health care access. We define access as actual use of personal health services and everything that facilitates or impedes their use. It is the link between health services systems and the populations they serve. Access means not only visiting a medical care provider but also getting to the right services at the right time to promote improved health outcomes. Conceptualizing and measuring access is the key to understanding and making health policy in a number of ways: (1) predicting use of health services, (2) promoting social justice, and (3) improving effectiveness and efficiency of health service delivery. The chapter presents a conceptual framework for understanding the multiple dimensions of access to medical care. The various types of access are considered and related to their policy purposes. Examples of key access measures are given, and trend data are used to track changes that have occurred over time in these access indicators. The chapter addresses the questions: Is access improving or declining in the United States? for whom? according to what measures? It concludes by discussing future access indicators and research directions.

Austin PC, Alter DA, Tu JV, The use of fixed- and random-effects models for classifying hospitals as mortality outliers: a Monte Carlo assessment, *Med Decis Making,* 2003;23(6):526-539.
Abstract: BACKGROUND: There is an increasing movement towards the release of hospital "report-cards. "However, there is a paucity of research into the abilities of the different methods to correctly classify hospitals as performance outliers. OBJECTIVE: To examine the ability of risk-adjusted mortality rates computed using conventional logistic regression and random-effects logistic regression models to correctly identify hospitals that have higher than acceptable mortality. RESEARCH DESIGN: Monte Carlo simulations. MEASURES: Sensitivity, specificity, and positive predictive value of a classification as a high-outlier for identifying hospitals with higher than acceptable mortality rates. RESULTS: When the distribution of hospital specific log-odds of death was normal, random-effects models had greater specificity and positive predictive value than fixed-effects models. However, fixed-effects models had greater sensitivity than random-effects models. CONCLUSIONS: Researchers and policy makers need to carefully consider the balance between false positives and false negatives when choosing statistical models for determining which hospitals have higher than acceptable mortality in performance profiling.

Baicker K, Chandra A, Skinner JS, et al., Who you are and where you live: how race and geography affect the treatment of Medicare beneficiaries, *Health Aff (Millwood),* 2004;Suppl Variation:VAR33-VAR44.
Abstract: The existence of overall racial and ethnic disparities in health care is well documented, but this average effect masks variation across regions and types of care. Medicare claims data are used to document the extent of these variations. Regions with high racial disparities in one procedure are not more likely to be high in other procedures. Unusually large racial disparities in surgery are often the result of high white rates rather than low black rates. Differences in end-of-life care are driven more by residence than by race. Policies should focus on getting the rates right, rather than solely on racial differences.

Bishop SM, *Are MA Star Ratings Biased Against Plans Serving Disadvantaged Populations? Prepared Under an Independent Contract With Amerigroup's Public Policy Institute,* Washington, DC: Amerigroup Public Policy Institute; 2012.

Calvillo-King L, Arnold D, Eubank KJ, et al., Impact of social factors on risk of readmission or mortality in pneumonia and heart failure: systematic review, *J Gen Intern Med,* 2013;28(2):269-282.
Abstract: BACKGROUND: Readmission and mortality after hospitalization for community-acquired pneumonia (CAP) and heart failure (HF) are publically reported. This systematic review assessed the impact of social factors on risk of readmission or mortality after hospitalization for CAP and HF-variables outside a hospital's control. METHODS: We searched OVID, PubMed and PSYCHINFO for studies from 1980 to 2012. Eligible articles examined the association between social factors and readmission or mortality in patients hospitalized with CAP or HF. We abstracted data on study characteristics, domains of social factors examined, and presence and magnitude of associations. RESULTS: Seventy-two articles met inclusion criteria (20 CAP, 52 HF). Most CAP studies evaluated age, gender, and race and found older age and non-White race were associated with worse outcomes. The results for gender were mixed. Few studies assessed higher level social factors, but those examined were often, but inconsistently, significantly associated with readmissions after CAP, including lower education, low income, and unemployment, and with mortality after CAP, including low income. For HF, older age was associated with worse outcomes and results for gender were mixed. Non-Whites had more readmissions after HF but decreased mortality. Again, higher level social factors were less frequently studied, but those examined were often, but inconsistently, significantly associated with readmissions, including low socioeconomic status (Medicaid insurance, low income), living situation (home stability rural address),

lack of social support, being unmarried and risk behaviors (smoking, cocaine use and medical/visit non-adherence). Similar findings were observed for factors associated with mortality after HF, along with psychiatric comorbidities, lack of home resources and greater distance to hospital. CONCLUSIONS: A broad range of social factors affect the risk of post-discharge readmission and mortality in CAP and HF. Future research on adverse events after discharge should study social determinants of health.

Casalino LP, Elster A, Eisenberg A, et al., Will pay-for-performance and quality reporting affect health care disparities?, *Health Aff (Millwood),* 2007;26(3):w405-w414.
Abstract: Pay-for-performance (P4P) and public quality-reporting programs can increase the quality of health care for the services being measured. However, unless carefully designed, these programs may have the unintended consequence of increasing racial and ethnic disparities. This paper describes ways in which P4P and public reporting programs may increase disparities and suggests ways in which programs might be designed that will make them likely to reduce, or at least not increase, disparities.

Chien AT, Wroblewski K, Damberg C, et al., Do physician organizations located in lower socioeconomic status areas score lower on pay-for-performance measures?, *J Gen Intern Med,* 2012;27(5):548-554.
Abstract: BACKGROUND: Physician organizations (POs)--independent practice associations and medical groups--located in lower socioeconomic status (SES) areas may score poorly in pay-for-performance (P4P) programs. OBJECTIVE: To examine the association between PO location and P4P performance. DESIGN: Cross-sectional study; Integrated Healthcare Association's (IHA's) P4P Program, the largest non-governmental, multi-payer program for POs in the U.S. PARTICIPANTS: 160 POs participating in 2009. MAIN MEASURES: We measured PO SES using established methods that involved geo-coding 11,718 practice sites within 160 POs to their respective census tracts and weighting tract-specific SES according to the number of primary care physicians at each site. P4P performance was defined by IHA's program and was a composite mainly representing clinical quality, but also including measures of patient experience, information technology and registry use. KEY RESULTS: The area-based PO SES measure ranged from -11 to +11 (mean 0, SD 5), and the IHA P4P performance score ranged from 23 to 86 (mean 69, SD 15). In bivariate analysis, there was a significant positive relationship between PO SES and P4P performance ($p < 0.001$). In multivariate analysis, a one standard deviation increase in PO SES was associated with a 44% increase (relative risk 1.44, 95%CI, 1.22-1.71) in the likelihood of a PO being ranked in the top two quintiles of performance ($p < 0.001$). CONCLUSIONS: Physician organizations' performance scores in a major P4P program vary by the SES of the areas in which their practice sites are located. P4P programs that do not account for this are likely to pay higher bonuses to POs in higher SES areas, thus increasing the resource gap between these POs and POs in lower SES areas, which may increase disparities in the care they provide.

Collado M, Patient health causes substantial portion of geographic variation in Medicare costs, *Find Brief,* 2013;16(5):1-4.
Abstract: Key findings. (1) Substantial geographic variation exists in Medicare costs, but to determine the source and extent of this variation requires proper accounting for population health differences. (2) While physician practice patterns likely affect Medicare geographic cost variations, population health explains at least 75 to 85 percent of the variations-more than previously estimated. (3) Policy strategies should consider the magnitude of the impact of beneficiary health status on Medicare costs in order to address geographic variation.

Crimmins EM, Hayward MD, Seeman TE, Race/Ethnicity, Socioeconomic Status, and Health, In: Anderson NB, Bulatao RA, Cohen B, editors, *Critical Perspectives on Racial and Ethnic Differences in Health in Late Life, National Research Council, Panel on Race, Ethnicity, and Health in Later Life. Committee on Population, Division of Behavioral and Social Sciences and Education,* Washington, DC: The National Academies Press; 2004, pp. 310-352.

Divi C, Koss RG, Schmaltz SP, et al., Language proficiency and adverse events in US hospitals: a pilot study, *Int J Qual Health Care,* 2007;19(2):60-67.
Abstract: OBJECTIVE: To examine differences in the characteristics of adverse events between English speaking patients and patients with limited English proficiency in US hospitals. SETTING: Six Joint Commission accredited hospitals in the USA. METHOD: Adverse event data on English speaking patients and patients with limited English proficiency were collected from six hospitals over 7 months in 2005 and classified using the National Quality Forum endorsed Patient Safety Event Taxonomy. RESULTS: About 49.1% of limited English proficient patient adverse events involved some physical harm whereas only 29.5% of adverse events for patients who speak English resulted in physical harm. Of those adverse events resulting in physical harm, 46.8% of the limited English proficient patient adverse events had a level of harm ranging from moderate temporary harm to death, compared with 24.4% of English speaking patient adverse events. The adverse events that occurred to limited English proficient patients were also more likely to be the result of communication errors (52.4%) than adverse events for English speaking patients (35.9%). CONCLUSIONS: Language barriers appear to increase the risks to patient safety. It is important for patients with language barriers to have ready access to competent language services. Providers need to collect reliable language data at the patient point of entry and document the language services provided during the patient-provider encounter.

Fiscella K, Franks P, Influence of patient education on profiles of physician practices, *Ann Intern Med,* 1999;131(10):745-751.
Abstract: BACKGROUND: Few data are available about the effect of patient socioeconomic status on profiles of physician practices. OBJECTIVE: To determine the ways in which adjustment for patients' level of education (as a measure of socioeconomic status) changes profiles of physician practices. DESIGN: Cross-sectional survey of patients in physician practices. SETTING: Managed care organization in western New York State. PARTICIPANTS: A random sample of 100 primary care physicians and 50 consecutive patients seen by each physician. MEASUREMENTS: Ranks of physicians for patient physical and mental health (Short Form 12-Item Health Survey) and satisfaction (Patient Satisfaction Questionnaire), adjusted for patient age, sex, morbidity, and education. RESULTS: Physicians whose patients had a lower mean level of education had significantly better ranks for patient physical and mental health status after adjustment for patients' level of education level than they did before adjustment ($P < 0.001$); this result was not seen for patient satisfaction. After adjustment for patients' level of education, each 1-year decrease in mean educational level was associated with a rank that improved by 8.1 (95% CI, 6.6 to 9.6) for patient physical health status and by 4.9 (CI, 3.9 to 5.9) for patient mental health status. Adjustment for education had similar effects for practices with more educated patients and those with less educated patients. CONCLUSIONS: Profiles of physician practices that base ratings of physician performance on patients' physical and mental health status are substantially affected by patients' level of education. However, these results do not suggest that physicians who care for less educated patients provide worse care. Physician profiling should account for differences in patients' level of education.

Franks P, Fiscella K, Effect of patient socioeconomic status on physician profiles for prevention, disease management, and diagnostic testing costs, *Med Care,* 2002;40(8):717-724.

Abstract: BACKGROUND: Previous research shows patient socioeconomic status (SES) affects physician profiles for health status and satisfaction, but effects on other aspects of care are not known. OBJECTIVE: To examine the effect of patient SES on physician profiles for preventive care, disease management, and diagnostic testing costs. RESEARCH DESIGN: Cross-sectional analysis of a managed care claims data. SUBJECTS: Five hundred sixty-eight physicians and 600,618 patients. MEASURES: Patient age, gender, case-mix, and SES based on zip code, likelihood of having a Papanicolaou smear, mammogram, for diabetics having had a glycosylated hemoglobin, diabetic eye exam, and diagnostic testing costs. RESULTS: For each performance indicator, except glycosylated hemoglobin, there was a statistically significant effect of adjusting for patient SES. For diabetic eye checks, mammograms and Papanicolaou tests respectively, 5%, 16%, and 21% of physicians who were outliers (in the top or bottom 5% of rankings) were no longer outliers after socioeconomic adjustment. For all performance measures the change in physician ranking was strongly correlated with the mean practice SES. CONCLUSIONS: Patient SES, as measured by zip code, appreciably affects physician profiles for preventive care and diabetes management. Monitoring patient SES using patient zip codes could be used to target resources to improve outcomes for higher risk patients.

Hasnain-Wynia R, Baker DW, Nerenz D, et al., Disparities in health care are driven by where minority patients seek care: examination of the hospital quality alliance measures, *Arch Intern Med,* 2007;167(12):1233-1239.
Abstract: BACKGROUND: Racial/ethnic disparities in health care are well documented, but less is known about whether disparities occur within or between hospitals for specific inpatient processes of care. We assessed racial/ethnic disparities using the Hospital Quality Alliance Inpatient Quality of Care Indicators. METHODS: We performed an observational study using patient-level data for acute myocardial infarction (5 care measures), congestive heart failure (2 measures), community-acquired pneumonia (2 measures), and patient counseling (4 measures). Data were obtained from 123 hospitals reporting to the University HealthSystem Consortium from the third quarter of 2002 to the first quarter of 2005. A total of 320,970 patients 18 years or older were eligible for at least 1 of the 13 measures. RESULTS: There were consistent unadjusted differences between minority and nonminority patients in the quality of care across 8 of 13 quality measures (from 4.63 and 4.55 percentage points for angiotensin-converting enzyme inhibitors for acute myocardial infarction and congestive heart failure [P<.01] to 14.58 percentage points for smoking cessation counseling for pneumonia [P=.02]). Disparities were most pronounced for counseling measures. In multivariate models adjusted for individual patient characteristics and hospital effect, the magnitude of the disparities decreased substantially, yet remained significant for 3 of the 4 counseling measures; acute myocardial infarction (unadjusted, 9.00 [P<.001]; adjusted, 3.82 [P<.01]), congestive heart failure (unadjusted, 8.45 [P=.02]; adjusted, 3.54 [P=.02]), and community-acquired pneumonia (unadjusted, 14.58 [P=.02]; adjusted, 4.96 [P=.01]). CONCLUSIONS: Disparities in clinical process of care measures are largely the result of differences in where minority and nonminority patients seek care. However, disparities in services requiring counseling exist within hospitals after controlling for site of care. Policies to reduce disparities should consider the underlying reasons for the disparities.

Hasnain-Wynia R, Kang R, Landrum MB, et al., Racial and ethnic disparities within and between hospitals for inpatient quality of care: an examination of patient-level Hospital Quality Alliance measures, *J Health Care Poor Underserved,* 2010;21(2):629-648.
Abstract: BACKGROUND: Little is known about whether disparities occur within or between hospitals for national Hospital Quality Alliance (HQA) measures. METHODS: We examined patient-level data from 4,450 non-federal hospitals in the U.S. for over 2.3 million Black, Hispanic, Asian, American Indian/Alaska

Native, and Native Hawaiian/Pacific Islander patients who received care for acute myocardial infarction, heart failure, or pneumonia in 2005. RESULTS: There were 37 out of 95 findings of disparities after adjusting for patient characteristics. Eleven of the disparities were explained entirely by where minorities received care and the magnitude for 25 of the others was substantially reduced after adjusting for site of care. DISCUSSION: Adjusting for between-hospital quality differences accounted for a large proportion of the disparities. Where disparities exist, the primary cause may be that minorities are more likely to receive care in lower-performing hospitals. Policies to reduce disparities should include targeting resources to facilities serving a high percentage of minority patients.

Iezzoni LI, Risk Adjustment for Measuring Health Care Outcomes, 2013;4th[Chicago, IL]: Health Administration Press;
Abstract: Notes: Iezzoni and other authors address conceptual and methodological topics regarding risk adjustment. Includes some discussion on risk factors related to disparities.

IOM Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care,* Washington, DC: The National Academies Press; 2003.
Abstract: Racial and ethnic disparities in health care are known to reflect access to care and other issues that arise from differing socioeconomic conditions. There is, however, increasing evidence that even after such differences are accounted for, race and ethnicity remain significant predictors of the quality of health care received. In Unequal Treatment, a panel of experts documents this evidence and explores how persons of color experience the health care environment. The book examines how disparities in treatment may arise in health care systems and looks at aspects of the clinical encounter that may contribute to such disparities. Patients and providers attitudes, expectations, and behavior are analyzed. How to intervene? Unequal Treatment offers recommendations for improvements in medical care financing, allocation of care, availability of language translation, community-based care, and other arenas. The committee highlights the potential of cross-cultural education to improve provider patient communication and offers a detailed look at how to integrate cross-cultural learning within the health professions. The book concludes with recommendations for data collection and research initiatives. Unequal Treatment will be vitally important to health care policymakers, administrators, providers, educators, and students as well as advocates for people of color.

Institute of Medicine (IOM). How far have we come in reducing health disparities? Progress since 2000: Workshop summary. Washington, DC: The National Academies Press; 2012.
Abstract: At the turn of the 21st century, several important reports and events designed to raise awareness of health disparities and to describe initial efforts to reduce health disparities took place. The Surgeon General's office released several reports that showed dramatic disparities in tobacco use and access to mental health services by race and ethnicity. The first real legislation focused on reducing health disparities was signed into law, creating the National Center for Minority Health and Health Disparities within the NIH. In 2001, the IOM released its landmark report, Crossing the Quality Chasm: A New Health System for the 21st Century, highlighting the importance of a focus on health care quality rather than a focus on only access and cost issues. Building upon these reports and events, the IOM held a workshop on April 8, 2010, that discussed progress to address health disparities and focused on the success of various federal initiatives to reduce health disparities. How Far Have We Come in Reducing Health Disparities? summarizes the workshop and explains the progress in the field since 2000.

Jha AK, Orav EJ, Li Z, et al., Concentration and quality of hospitals that care for elderly black patients, *Arch Intern Med,* 2007;167(11):1177-1182.
Abstract: BACKGROUND: The reasons for racial differences in health care are not well known, but the characteristics of hospitals where people receive care may be an important factor in the quality of care that patients receive. Therefore, we sought to determine the proportion and volume of elderly black vs white patients treated at hospitals and examine the characteristics and performances of hospitals that care for disproportionately high volumes of black patients. METHODS: We used 2004 Medicare data to calculate, for each hospital in our study, the volume and proportion of black patients discharged. We then examined the hospitals' structural characteristics and performances according to quality measures for patients with acute myocardial infarction, congestive heart failure, and pneumonia. RESULTS: The 5% of hospitals with the highest volume of black patients cared for nearly half of all elderly black patients, and the hospitals in the top quartile by volume of patients cared for nearly 90% of elderly black patients. Hospitals with a high volume of black patients were larger and were more often teaching hospitals located in the southern United States (P<.001 for each comparison) than those with a low volume of black patients. Hospitals with a high proportion of black patients had comparable characteristics. After adjusting for hospital characteristics, hospitals that treated a high vs low volume of black patients had worse performance summary scores for acute myocardial infarction (89.0 vs 90.7; P = .002) and pneumonia measures (76.9 vs 79.4; P<.001). Adjusting for hospital referral region eliminated the gap in performance scores for acute myocardial infarction but not for pneumonia. There were comparable differences in performance scores for hospitals that treated a high vs low proportion of black patients. CONCLUSIONS: Hospital care for black patients in the United States is remarkably concentrated in a small percentage of hospitals, although the hospitals that care for a high proportion of black patients have only marginally worse quality of care than those that care for a low proportion of black patients. The level of concentration of black patients provides a fresh opportunity to improve care for black patients by targeting efforts toward a small group of hospitals.

Jha AK, Orav EJ, Epstein AM, Low-quality, high-cost hospitals, mainly in South, care for sharply higher shares of elderly black, Hispanic, and medicaid patients, *Health Aff (Millwood),* 2011;30(10):1904-1911.
Abstract: As policy makers design national programs aimed at managing the quality and costs of health care, it is important to understand the potential impact on minority and poor patients and the hospitals that provide most of their care. We analyzed a range of hospital data and assigned hospitals to various categories, including "best"-high-quality, low-cost institutions-and "worst"-where quality is low and costs high. We found that the "worst" hospitals-typically small public or for-profit institutions in the South-care for double the proportion (15 percent versus 7 percent) of elderly black patients as the "best" hospitals-typically nonprofit institutions in the Northeast. Similarly, elderly Hispanic and Medicaid patients accounted for 1 percent and 15 percent, respectively, of the patient population at the best hospitals, while at the worst hospitals, these groups represented 4 percent and 23 percent of the patients. Patients with acute myocardial infarction at the worst hospitals had 7-10 percent higher odds of death compared to patients with those conditions admitted to the best hospitals. Our findings have important implications for Medicare's forthcoming value-based purchasing program. The worst institutions in particular will have to improve on both costs and quality to avoid incurring financial penalties and exacerbating disparities in care.

Joynt KE, Orav EJ, Jha AK, Thirty-day readmission rates for Medicare beneficiaries by race and site of care, *JAMA,* 2011;305(7):675-681.
Abstract: CONTEXT: Understanding whether and why there are racial disparities in readmissions has implications for efforts to reduce readmissions. OBJECTIVE: To determine whether black patients have

higher odds of readmission than white patients and whether these disparities are related to where black patients receive care. DESIGN: Using national Medicare data, we examined 30-day readmissions after hospitalization for acute myocardial infarction (MI), congestive heart failure (CHF), and pneumonia. We categorized hospitals in the top decile of proportion of black patients as minority-serving. We determined the odds of readmission for black patients compared with white patients at minority-serving vs non-minority-serving hospitals. SETTING AND PARTICIPANTS: Medicare Provider Analysis Review files of more than 3.1 million Medicare fee-for-service recipients who were discharged from US hospitals in 2006-2008. MAIN OUTCOME MEASURE: Risk-adjusted odds of 30-day readmission. RESULTS: Overall, black patients had higher readmission rates than white patients (24.8% vs 22.6%, odds ratio [OR], 1.13; 95% confidence interval [CI], 1.11-1.14; P < .001); patients from minority-serving hospitals had higher readmission rates than those from non-minority-serving hospitals (25.5% vs 22.0%, OR, 1.23; 95% CI, 1.20-1.27; P < .001). Among patients with acute MI and using white patients from non-minority-serving hospitals as the reference group (readmission rate 20.9%), black patients from minority-serving hospitals had the highest readmission rate (26.4%; OR, 1.35; 95% CI, 1.28-1.42), while white patients from minority-serving hospitals had a 24.6% readmission rate (OR, 1.23; 95% CI, 1.18-1.29) and black patients from non-minority-serving hospitals had a 23.3% readmission rate (OR, 1.20; 95% CI, 1.16-1.23; P < .001 for each); patterns were similar for CHF and pneumonia. The results were unchanged after adjusting for hospital characteristics including markers of caring for poor patients. CONCLUSION: Among elderly Medicare recipients, black patients were more likely to be readmitted after hospitalization for 3 common conditions, a gap that was related to both race and to the site where care was received.

Kirby JB, Kaneda T, 'Double jeopardy' measure suggests blacks and hispanics face more severe disparities than previously indicated, *Health Aff (Millwood),* 2013;32(10):1766-1772.
Abstract: Eliminating disparities in health and health care is a long-standing objective of the US government. Racial and ethnic differences in insurance coverage pose a major obstacle to achieving this objective. With important coverage provisions of the Affordable Care Act beginning to take effect, we propose a new way of conceptualizing and quantifying the racial and ethnic disadvantages of uninsurance over the course of a lifetime. Using a life expectancy approach, we estimate the number of years whites, blacks, and Hispanics can expect to live in insurance "double jeopardy": being uninsured while also in lesser health and, therefore, at higher risk of needing medical care. Our measures indicate that compared to whites, Hispanics and blacks are more likely not only to be uninsured at any point throughout most of their lives, but also to spend more years uninsured and spend more of these uninsured years at high risk of needing medical care. These life expectancy measures-designed for ease of use by policy makers, researchers, and the general public-have the potential to reframe the discussion of disparities and monitor progress toward their elimination.

Maney M, Tseng CL, Safford MM, et al., Impact of self-reported patient characteristics upon assessment of glycemic control in the Veterans Health Administration, *Diabetes Care,* 2007;30(2):245-251.
Abstract: OBJECTIVE: The purpose of this article was to evaluate the impact of self-reported patient factors on quality assessment of Veterans Health Administration medical centers in achieving glycemic control. RESEARCH DESIGN AND METHODS: We linked survey data and administrative records for veterans who self-reported diabetes on a 1999 national weighted survey. Linear regression models were used to adjust A1C levels in fiscal year 2000 for socioeconomic status (education level, employment, and concerns of having enough food), social support (marital status and living alone), health behaviors (smoking, alcohol use, and exercise level), physical and mental health status, BMI, and diabetes duration. Medical centers were ranked by deciles, with and without adjustment for patient characteristics, on proportions of patients achieving A1C <7 or <8%. RESULTS: There was substantial

medical center level variation in patient characteristics of the 56,740 individuals from 105 centers, e.g., grade school education (mean 15.3% [range 2.3-32.7%]), being retired (38.3% [19.9-59.7%]) or married (65.2% [43.7-77.8%]), food insufficiency (13.9% [7.2-24.6%]), and no reported exercise (43.2% [31.1-53.6%]). The final model had an R(2) of 7.8%. The Spearman rank coefficient comparing the thresholds adjusted only for age and sex to the full model was 0.71 for <7% and 0.64 for <8% (P < 0.0001). After risk adjustment, 4 of the 11 best-performing centers changed at least two deciles for the <7% threshold, and 2 of 11 changed two deciles for the <8% threshold. CONCLUSIONS: Adjustment for patient self-reported socioeconomic status and health impacts medical center rankings for glycemic control, suggesting the need for risk adjustment to assure valid inferences about quality.

Medicare Payment Advisory Commission (MedPAC), *Refining the Hospital Readmissions Reduction Program,* Washington, DC: MedPAC; 2013. Available at http://www.medpac.gov/.
Abstract: Notes: MedPAC's June 2013 report to Congress recommended not including SES in risk adjustment for hospital readmissions so that disparities are not masked. However, it recommended setting targets and evaluating performance in relation to peer groups based on percentage of Medicare patients on SSI. It also recommended targeting resources to help hospitals serving the largest share of poor patients.

National Quality Forum N, *Healthcare Disparities and Cultural Competency Consensus Standards: Technical Report,* Washington, DC: NQF; 2012. Available at https://www.qualityforum.org/projects/Healthcare_Disparities_and_Cultural_Competency.aspx.
Abstract: One essential step to improving the quality of healthcare performance is to eliminate disparities in care. Healthcare disparities may be exacerbated by many things including specific health conditions, differences in access to care, provider biases, poor patient-provider communication, and poor health literacy. The Institute of Medicine report, Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care, found that racial and ethnic minorities often receive lower quality of care than their white counterparts, even after controlling for factors such as insurance, socioeconomic status, comorbidities, and stage of presentation. An integral understanding of healthcare disparities measurement is needed to create a long term agenda for improving healthcare quality for vulnerable populations and others adversely affected by disparities. By analyzing the effectiveness of quality measures already in place and identifying gaps, the National Quality Forum (NQF) aims to establish a more detailed picture of how to approach measurement of healthcare disparities across settings and populations.

National Quality Forum N, *Healthcare Disparities and Cultural Competency Consensus Standards: Disparities-Sensitive Measure Assessment,* Washington, DC: National Quality Forum; 2012. Available at https://www.qualityforum.org/Publications/2012/11/Healthcare_Disparities_and_Cultural_Competency_Consensus_Standards__Disparities-Sensitive_Measure_Assessment.aspx.
Abstract: In 2011, NQF sought to establish a broader platform for addressing healthcare disparities and cultural competency in measurement. The resulting Healthcare Disparities and Cultural Competency Consensus Standards project was focused on identifying valid and reliable performance measures in these areas, as well as a set of disparities-sensitive measures among the existing NQF portfolio of endorsed measures. In this final phase of work, disparities-sensitive criteria were finalized and an initial set of disparities-sensitive measures was identified. As part of this effort, NQF has developed a prospective approach for the assessment of disparities-sensitivity for all new and maintenance measures submitted to NQF.

Reschovsky JD, Hadley J, Romano PS, Geographic Variation in Fee-for-Service Medicare Beneficiaries' Medical Costs Is Largely Explained by Disease Burden, *Med Care Res Rev,* 2013;70(5):542-563.
Abstract: Control for area differences in population health (casemix adjustment) is necessary to measure geographic variations in medical spending. Studies use various casemix adjustment methods, resulting in very different geographic variation estimates. We study casemix adjustment methodological issues and evaluate alternative approaches using claims from 1.6 million Medicare beneficiaries in 60 representative communities. Two key casemix adjustment methods-controlling for patient conditions obtained from diagnoses on claims and expenditures of those at the end of life-were evaluated. We failed to find evidence of bias in the former approach attributable to area differences in physician diagnostic patterns, as others have found, and found that the assumption underpinning the latter approach-that persons close to death are equally sick across areas-cannot be supported. Diagnosis-based approaches are more appropriate when current rather than prior year diagnoses are used. Population health likely explains more than 75% to 85% of cost variations across fixed sets of areas.

Romano PS, Should health plan quality measures be adjusted for case mix?, *Med Care,* 2000;38(10):977-980.

Rosen AK, Reid R, Broemeling AM, et al., Applying a risk-adjustment framework to primary care: can we improve on existing measures?, *Ann Fam Med,* 2003;1(1):44-51.
Abstract: Outcome-based performance measurement and prospective payment are common features of the current managed care environment. Increasingly, primary care clinicians and health care organizations are being asked to assume financial risk for enrolled patients based on negotiated capitation rates. Therefore, the need for methods to account for differences in risk among patients enrolled in primary care organizations has become critical. Although current risk-adjustment measures represent significant advances in the measurement of morbidity in primary care populations, they may not adequately capture all the dimensions of patient risk relevant to primary care. We propose a risk-adjustment framework for primary care that incorporates clinical features related to patients' health status and nonclinical factors related to patients' health behaviors, psychosocial factors, and social environment. Without this broad perspective, clinicians with more unhealthy and more challenging populations are at risk of being inadequately compensated and inequitably compared with peers. The risk-adjustment framework should also be of use to health care organizations that have been mandated to deliver high-quality primary care but are lacking the necessary tools.

Schoen C, Radley D, Riley P, et al., *Health Care in the Two Americas: Findings From the Scorecard on State Health System Performance for Low-Income Populations, 2013,* New York, NY: The Commonwealth Fund; 2013. Report No.: Pub No. 1700. Available at http://www.commonwealthfund.org/Publications/Fund-Reports/2013/Sep/Low-Income-Scorecard.aspx?page=all.
Abstract: The Commonwealth Fund's Scorecard on State Health System Performance for Low-Income Populations, 2013, identifies opportunities for states to improve their health systems for economically disadvantaged populations and provides state benchmarks of achievement. Analyzing 30 indicators of access, prevention and quality, potentially avoidable hospital use, and health outcomes, the Scorecard documents sharp health care disparities among states. Between leading and lagging states, up to a fourfold disparity in performance exists on a range of key health care indicators for low-income populations. There are also wide differences within states by income. If all states could reach the benchmarks set by leading states, an estimated 86,000 fewer people would die prematurely and tens of millions more adults and children would receive timely preventive care. Moreover, many benchmarks

for low-income populations in the top states were better than average and better than those for higher-income or more-educated individuals in the lagging states.

Silber JH, et al., Comparing the contributions of groups of predictors: which outcomes vary with hospital rather than patient characteristics?, *J Am Stat Assoc,* 1995;90:7-18.

Starfield B, Gervas J, Mangin D, Clinical care and health disparities, *Annu Rev Public Health,* 2012;33:89-106.
Abstract: Health disparities, also known as health inequities, are systematic and potentially remediable differences in one or more aspects of health across population groups defined socially, economically, demographically, or geographically. This topic has been the subject of research stretching back at least decades. Reports and studies have delved into how inequities develop in different societies and, with particular regard to health services, in access to and financing of health systems. In this review, we consider empirical studies from the United States and elsewhere, and we focus on how one aspect of health systems, clinical care, contributes to maintaining systematic differences in health across population groups characterized by social disadvantage. We consider inequities in clinical care and the policies that influence them. We develop a framework for considering the structural and behavioral components of clinical care and review the existing literature for evidence that is likely to be generalizable across health systems over time. Starting with the assumption that health services, as one aspect of social services, ought to enhance equity in health care, we conclude with a discussion of threats to that role and what might be done about them.

Tabak YP, Johannes RS, Silber JH, Using automated clinical data for risk adjustment: development and validation of six disease-specific mortality predictive models for pay-for-performance, *Med Care,* 2007;45(8):789-805.
Abstract: BACKGROUND: Clinically plausible risk-adjustment methods are needed to implement pay-for-performance protocols. Because billing data lacks clinical precision, may be gamed, and chart abstraction is costly, we sought to develop predictive models for mortality that maximally used automated laboratory data and intentionally minimized the use of administrative data (Laboratory Models). We also evaluated the additional value of vital signs and altered mental status (Full Models). METHODS: Six models predicting in-hospital mortality for ischemic and hemorrhagic stroke, pneumonia, myocardial infarction, heart failure, and septicemia were derived from 194,903 admissions in 2000-2003 across 71 hospitals that imported laboratory data. Demographics, admission-based labs, International Classification of Diseases (ICD)-9 variables, vital signs, and altered mental status were sequentially entered as covariates. Models were validated using abstractions (629,490 admissions) from 195 hospitals. Finally, we constructed hierarchical models to compare hospital performance using the Laboratory Models and the Full Models. RESULTS: Model c-statistics ranged from 0.81 to 0.89. As constructed, laboratory findings contributed more to the prediction of death compared with any other risk factor characteristic groups across most models except for stroke, where altered mental status was more important. Laboratory variables were between 2 and 67 times more important in predicting mortality than ICD-9 variables. The hospital-level risk-standardized mortality rates derived from the Laboratory Models were highly correlated with the results derived from the Full Models (average rho = 0.92). CONCLUSIONS: Mortality can be well predicted using models that maximize reliance on objective pathophysiologic variables whereas minimizing input from billing data. Such models should be less susceptible to the vagaries of billing information and inexpensive to implement.

The COPSS-CMS White Paper Committee, Ash AS, Fienberg SE, et al., *Statistical Issues in Assessing Hospital Performance Commissioned by the Committee of Presidents of Statistical Societies,* Baltimore, MD: Centers for Medicare and Medicaid Services; 2012. Available at http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/OutcomeMeasures.html .
Abstract: The Centers for Medicare and Medicaid Services (CMS), through a subcontract with Yale New Haven Health Services Corporation, Center for Outcomes Research and Evaluation (YNHHSC/CORE), is supporting a committee appointed by the Committee of Presidents of Statistical Societies (COPSS) to address statistical issues identified by the CMS and stakeholders about CMS's approach to modeling hospital quality based on outcomes. In the spring of 2011, with the direct support of YNHHSC/CORE, COPSS formed a committee comprised of one member from each of its constituent societies, a chair, and a staff member from the American Statistical Association, and held a preliminary meeting in April. In June, YNHHSC/CORE executed a subcontract with COPSS under its CMS contract to support the development of a White Paper on statistical modeling. Specifically, YNHHSC/CORE contracted with COPSS to "provide guidance on statistical approaches . . .when estimating performance metrics," and "consider and discuss concerns commonly raised by stakeholders (hospitals, consumer, and insurers) about the use of "hierarchical generalized linear models in profiling hospital quality. The committee convened in June and August of 2011, and exchanged a wide variety of materials. To ensure the committee's independence, YNHHSC/CORE did not comment on the white paper findings, and CMS pre-cleared COPSS' publication of an academic manuscript based on the White Paper.

Weissman JS, Stern RS, Epstein AM, The impact of patient socioeconomic status and other social factors on readmission: a prospective study in four Massachusetts hospitals, *Inquiry,* 1994;31(2):163-172.
Abstract: Readmissions to hospitals may serve as markers for morbidity, high costs, and potentially poor quality of care, yet little is known about the relation of socioeconomic factors to the likelihood of readmission. In this article, we used logistic regression models to examine the readmission experience of nearly 12,000 patients, adjusting for age, gender, hospital, severity of illness, and the overall probability of readmission within each diagnosis related group (DRG). After adjustment, patients were more likely to be readmitted within 60 days if they were poor (OR = 1.25, $p < .05$), worked in unskilled or semiskilled occupations (OR = 1.25, $p < .05$), or rented their homes (OR = 1.23, $p < .01$). Nonwhites (OR = .76, $p < .01$) and uninsured patients (OR = .48, $p < .01$) were less likely to be readmitted. Within a 7-day period, patients who rented their homes were more likely to be readmitted (OR = 1.32), while patients were less likely to be readmitted if they were uninsured (OR = .36) or nonwhite (OR = .72) (all $p < .05$). Social support factors including marital status, living situation, and availability of help at home were not associated significantly with the risk of readmission. Our results suggest that patients in lower socioeconomic positions have higher readmission rates, at least for readmissions within longer time periods. Providers designing interventions to reduce the risk of readmission may want to target the groups identified by our study.

Weissman JS, Betancourt JR, Green AR, et al., *Commissioned Paper: Healthcare Disparities Measurement,* Washington, DC: National Quality Forum; 2011. Available at https://www.qualityforum.org/projects/Healthcare_Disparities_and_Cultural_Competency.aspx.
Abstract: The purpose of this report is to: 1) provide guidance to a National Quality Forum (NQF) Steering Committee charged with selecting and evaluating disparity-sensitive quality measures, 2) describe methodological issues with disparities measurement, and 3) identify cross-cutting measurement gaps in disparities.

Zaslavsky AM, Hochheimer JN, Schneider EC, et al., Impact of sociodemographic case mix on the HEDIS measures of health plan quality, *Med Care,* 2000;38(10):981-992.
Abstract: BACKGROUND: The widely used Health Plan Employer Data and Information Set (HEDIS) measures may be affected by differences among plans in sociodemographic characteristics of members. OBJECTIVE: The objective of this study was to estimate effects of geographically linked patient sociodemographic characteristics on differential performance within and among plans on HEDIS measures. RESEARCH DESIGN: Using logistic regression, we modeled associations between age, sex, and residential area characteristics of health plan members and results on HEDIS measures. We then calculated the impact of adjusting for these associations on plan-level measures. SUBJECTS: This study included 92,232 commercially insured members with individual-level HEDIS data and an additional 20,615 members whose geographic distribution was provided. MEASURES: This study used 7 measures of screening and preventive services. RESULTS: Performance was negatively associated with percent receiving public assistance in the local area (6 of 7 measures), percent black (5 measures), and percent Hispanic (2 measures) and positively associated with percent college educated (6 measures), percent urban (2 measures), and percent Asian (1 measure) after controlling for plan and product type. These effects were generally consistent across plans. When measures were adjusted for these characteristics, rates for most plans changed by less than 5 percentage points. The largest change in the difference between plans ranged from 1.5% for retinal exams for people with diabetes to 20.2% for immunization of adolescents. CONCLUSIONS: Performance on quality indicators for individual members is associated with sociodemographic context. Adjustment has little impact on the measured performance of most plans but a substantial impact on a few. Further study with more plans is required to determine the appropriateness and feasibility of adjustment.