

MEASURING HEALTH EQUITY: A Review of Scoring Approaches



Introduction

Health equity means that all individuals have the opportunity to achieve optimal health.¹ Health equity is a central component of health care quality, yet attempts to capture progress toward achieving it have been limited to measures of disparities.² This policy brief reviews the most promising approaches for measuring equitable health care quality among state Medicaid programs and Medicaid managed care organizations (MCO), and is part of broader work to examine standardized health equity quality measurement for Medicaid programs which included an overview of current health equity quality measures and applications and a proposal for a set of health equity domains and quality measures that can be leveraged by state Medicaid programs in an accountability and payment program.^{3,4} Although measuring equitable health care quality and outcomes can be applied at various levels of health care delivery and has been previously documented, the approaches outlined here were evaluated for their utility with respect to health plan accountability.⁵

For state Medicaid programs and MCOs, which provide health care for populations with low income or low access to health care, mitigating the negative effects of such social risk factors is a critical strategy for achieving health equity goals. State Medicaid programs are well positioned to have meaningful impact on populations with social risk factors, and have developed programs and provided services to meet these populations' needs. In January 2021, the Centers for Medicare & Medicaid Services released guidance on how state Medicaid and Children's Health Insurance Programs can be leveraged to address social needs and improve health outcomes.⁶ States may also use Section 1115 Waivers to pilot programs that address housing, food and transportation insecurity.⁷⁻⁹

Social determinants of health (SDOH)—the conditions in which individuals live, work and age—include structural determinants (e.g., socioeconomic status, social and public policies, systemic racism and sexism) that inform the socioeconomic and political context, and downstream determinants (e.g., housing, the built environment in a community) that produces health inequities.¹⁰ Historical and contemporary configurations of law, policy, economic and social practices and societal conditions, including housing segregation, economic disinvestment, food deserts and structures of public and private transportation systems, all contribute to uneven health outcomes. Many indicators of SDOH operate outside the health care system and contribute to most of the variation in health outcomes.¹¹ Still, health plans are well positioned to address indicators of SDOH (e.g., housing, food insecurity, transportation) as a strategy to reduce health inequities and improve population health outcomes. For example, Medi-Cal has made it possible for MCOs to mitigate some SDOH more directly through initiatives such as offering housing support in lieu of services like in-home provider visits.¹²

Rating health equity encourages health plans to intervene and help produce high-quality outcomes for all. Plans can improve their performance over time, relative to their own performance and that of other plans, and address factors that contribute to health disparities in their populations. Just as it is possible (and desirable) to maximize positive health outcomes for membership in the aggregate, health plans can also ensure gains for members who experience high levels of social risk factors. Examining health care quality across race, ethnicity, socioeconomic status, gender, age and geography has shown that while there may be significant overall gains in some areas, a substantial number of areas need improvement.¹³ This document describes the most relevant attributes of rating health equity, and reviews promising health equity metrics along those dimensions.



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Key Dimensions of Rating Health Equity

Our review identified four common dimensions that differentiate approaches to rating equitable health care quality: selecting indicators of SDOH; selecting reference group; selecting health care quality metrics (including whether to use composite approaches); and benchmarking.

IDENTIFYING AND SELECTING INDICATORS OF SOCIAL DETERMINANTS OF HEALTH

Health equity ratings should demonstrate how the quality of care provided reduces disparities in health outcomes for populations that are adversely impacted by social risk factors.¹⁴ It is important to delineate indicators of SDOH (e.g., income, education, race, ethnicity, gender) in health equity rating approaches. These indicators are often most accessible in terms of data availability, and serve as proxy indicators for socioeconomic position and as imperfect proxy indicators for exposure to systemic racism and sexism.^{15,16} Indicators of SDOH are essentially a tool to produce subgroup analyses for estimating the extent of health disparities, and can help target monitoring and interventions. Incorporating them into measurement approaches by stratification or adjustment offers a mechanism to monitor progress toward health equity by providing information on changes in health outcomes and quality over time.

Stratification is the foundation for a variety of techniques used to assess health equity. Although groupings can be debated (i.e., which racial and ethnic categories to consider, how to categorize educational attainment or income), stratifications must be assessed in order to evaluate health equity.

Health plans have stratified populations by indicators of SDOH to understand where the largest health care gaps are and which indicators are tied to social risk factors that may contribute to these disparities. Stratified performance data could also inform quality improvement by focusing performance measures on groups experiencing disparities.¹⁷ In the context of value-based purchasing programs, health plans that use risk-stratification can consider adjusting payments, particularly for providers that care for a higher proportion of socially disadvantaged patients. State Medicaid agencies have also used reporting requirements and payment adjustments, including withholding payments, to incentivize health plans to meet equity-focused quality measures and narrow existing health care quality gaps.^{18,19}

Inherent in this process is identifying whether multiple indicators of SDOH should be considered, and how they will be integrated with one another. Indicators of SDOH (e.g., race, gender, socioeconomic status) do not exist in isolation, even though they might operate in distinct ways. The first consideration is whether to tackle multiple indicators as discrete or as intersecting phenomena. The discrete approach accounts for only one indicator at a time, even if the model considers multiple indicators. For example, a metric may account for racial differences separately from income differences. The intersectional approach accounts for multiple indicators simultaneously. Metrics might stratify by race and income together, creating groups such as White/low income, White/high income, Black/low income, Black/high income and so on.

SELECTING A REFERENCE GROUP

Health equity rating metrics must identify a reference group. The a priori approach to this recognizes that certain structural and social advantages contribute to health inequities. While these advantages might not always translate into the best health outcomes, they are persistent and worth noting (e.g., populations of high-income White men).²⁰ The data-driven approach identifies the group experiencing the best (or, conversely, the worst) performance outcomes, and compares the outcomes for all other groups to the outcomes experienced by that one. This approach recognizes that although systemic privileges may often advantage some social groups over others, they do not guarantee optimal health outcomes.

Both the a priori and data-driven approaches have strengths and weaknesses, whether they emphasize broader structural and systemic advantages and disadvantages (which are regularly and routinely experienced) or identify the best possible outcome for all groups and reference against that. State Medicaid programs should consider state demographics, the needs of MCO members and historical quality performance across social risk factors when determining the best approach for improving health care quality.

SELECTION OF HEALTH CARE QUALITY METRICS

Rating equitable health care quality requires a suite of health care metrics, and there is a readily available variety, depending on the unit of analysis.³ Health equity strategies designed for application at the state level often select outcomes such as infant mortality or diabetes prevalence; these tend to adopt a “lower is better” scoring approach. Strategies designed for application at the health plan level often select health metrics such as receiving appropriate vaccinations, screening for common cancers or follow-up care; these tend to adopt a “higher is better” scoring approach. While strategies reviewed in this brief utilize different measure sets, all can be adapted to nearly any well-designed health outcome metric.

Perhaps a more important distinction is whether the suite of measures used is composited to create a single score. Some strategies are designed to use only one measure at a time, making compositing moot. Other strategies use several measures and calculate a composite during the measurement process.

USE OF BENCHMARKING

Benchmarking establishes a standard for assessing performance; it is a key feature of value-based payment models and is intended to incentivize health plans and providers to improve or maintain a certain level of performance.²¹ Benchmarks that provide external comparison are particularly useful for state Medicaid programs to compare performance of health plans (or MCOs). Benchmarking helps identify gaps in health outcomes, monitor progress over time and identify priority areas for population health improvement. Benchmarks can also be applied to health equity ratings, to identify gaps in process and outcome performance measures linked to disparities in health conditions.

Benchmarks can identify gaps in provider performance, quality of care and clinical outcomes, relative to other entities. The use of benchmarking in combination with stratification by social risk factor provides additional insight on the level of disparities for a performance measure. Some health equity strategies reviewed here incorporate comparison to an external benchmark defined by performance of other reporting units, although the mathematical steps for calculating comparison vary.



Review of Major Rating Approaches for Health Equity

Below, we outline four approaches to scoring health equity. While each was developed for particular use cases, we believe all to be easily adaptable to a variety of reporting units and settings. We also discuss alternate strategies that may provide different views of inequities, and implications for quality improvement. To be clear, when we refer to a group’s performance outcomes, we mean the health outcomes the group experiences because of systemic practices related to health care delivery and broader societal forces. We do not mean to suggest that members of the group bear responsibility for outcomes. All scoring approaches described below evaluate a set of reporting units (e.g., health plan, state).

TABLE 1: Overview of Health Equity Rating Approaches and Key Dimensions

	SCALE	ORIGINAL DATA SOURCE	HEALTH-RELATED METRIC	INDICATORS OF SDOH	REFERENCE GROUP	EXTERNAL BENCHMARK
HEM	0 to 1 (1 = most equitable)	Population Health Survey	Single No composite	Multiple Intersectional	a priori	No
PHPI	0 to 1 (1 = most equitable)	Population Health Survey	Single No composite	Single (binary) Discrete	Data driven	Yes
Humana’s Approach	Lower = more equitable Scale unspecified	Health Plan	Multiple Composited	Multiple Intersectional	a priori	No
HESS	1 to 5 (5 = most equitable)	Health Plan	Multiple Composited	Multiple Discrete	a priori Data driven	Yes

THE HEALTH EQUITY METRIC

The Health Equity Metric (HEM), developed to compare health equity outcomes among state populations, does not use a composite or compare to an external benchmark.²² It takes a single health metric (e.g., number of healthy days), stratified simultaneously by race, income and sex, and calculates the median value for each group. In the published example, the reference group was White, high-income men, identified through an a priori approach. As developed, the HEM works for only one health metric at a time, although a composite of multiple HEM scores is theoretically possible.

The HEM is distinct from other approaches in that it compares the reference group at the individual level, rather than at the population level. Within each reporting unit, the HEM compares an individual patient’s score to the median reference group value, takes a sum-of-squares average and inverts the value. This results in a score ranging from 0–1; scores closer to 1 indicate more equal outcomes between the comparison and the reference groups. The score can be compared to other reporting units and tracked over time.

THE POPULATION HEALTH PERFORMANCE INDEX

The Population Health Performance Index (PHPI), also developed to compare state populations, includes two components: one for overall population health and one for health inequity (we focus on the health inequity component). The PHPI does not calculate a composite, but it does incorporate an external benchmark.²³ It takes a single health metric (e.g., infant mortality, number of unhealthy days) and stratifies it for each reporting unit according to a single, binarized dimension of social inequality (e.g., race, educational attainment). For each reporting unit, the PHPI subtracts the rate of the group experiencing the lowest performance outcome from the rate of the group experiencing the highest performance outcome; this is the reporting unit's inequality rate. The benchmark is established by identifying the reporting unit with the greatest inequality rate. Each reporting unit's inequality rate is divided by the benchmark and subtracted from 1. The resulting Inequality Index^A ranges from 0–1. Higher scores indicate more equal outcomes between groups in a reporting unit. Scores can be compared with other reporting units and potentially tracked over time.

The PHPI only considers one dimension of social risk at a time, but could be adapted to include more (given available data), when it would likely combine dimensions at the end of the process (similar to the Health Equity Summary Score, below). It would also be possible to create a composite score of multiple health metrics by combining the final outcome of each (similar to the HEM).

A distinct feature of the PHPI is that it can accommodate metrics with a “lower is better” principle. This aligns with quality measure concepts of inappropriate or avoidable utilization, as well as with safety metrics. This approach could be adapted to accommodate more traditional “higher is better” measures by identifying the best-performing reporting unit (i.e., with the lead inequality) as the benchmark and skipping the “subtract from 1” step.

HUMANA'S APPROACH

Humana's strategy evaluates performance across Medicare Advantage plans, but can easily be adapted for use with any type of health plan.²⁴ Because it was developed for Humana's internal quality improvement efforts, it does not incorporate an external benchmark, but it does composite across eight health behavior measures,^B which the authors note can easily be expanded or modified to focus on a particular health domain (e.g., utilization, maternal health, general health outcomes). The strategy calculates rates stratified simultaneously by race/ethnicity and dual-eligibility status (as a proxy for socioeconomic status), and then calculates a composite score by social group configuration (e.g., White, dually eligible members; Black, non-dually eligible members).

This strategy then applies an a priori approach by using White, non-dually eligible members as the reference group and calculating the difference between this group's rate and the rates for all other groups. In a case study using this strategy, Humana found that Asian patients (both dually eligible and non-dually eligible) experienced better outcomes than the a priori reference group, so the difference between Asian and White patients was set to 0 in order to avoid minimizing inequalities relative to other groups. Differences were then combined to get a Between-Group Disparity Score.^C Lower scores indicate smaller disparities between groups. Even without an external benchmark, the strategy is robust enough that part of it could be used to compare multiple plans (or other reporting units) and track performance over time.

^A The original PHPI also calculates an overall health outcome for each reporting unit, compares it to the worst-performing unit in a similar fashion and combines this Mean Health Index with the Inequality Index using a weighted average. However, this step is beyond the scope of this paper and also masks overall health performance and health equity between social groups.

^B The selected health behavior measures covered the domains of medication adherence, preventive care, diabetes care, vaccinations and having a primary care provider visit.

^C Humana also calculates a Within-Group Disparity Score by using each group's standard deviation and summing the differences, although this seems directed more at internal quality improvement efforts than at cross-unit comparison.

THE HEALTH EQUITY SUMMARY SCORE

The Health Equity Summary Score (HESS) was designed to compare health equity outcomes across Medicare Advantage plans but could easily be adapted for health plans.³⁰ It incorporates both an external benchmark and multiple composite calculations. It is a robust, complex method that examines health equity cross-sectionally and longitudinally—the longitudinal approach is distinct among the strategies we examined. The HESS stratifies 12 clinical quality and patient experience measures by race/ethnicity and dual-eligibility status (as a proxy for socioeconomic characteristics). Unlike the HEM and Humana approach, stratification is done separately. The HESS incorporates data from two years—the current year and the prior year^D—to calculate a cross-sectional benchmark for each measure and for both years using a weighted average across all reporting units, grouped by social category. Six scores are calculated: three for race/ethnicity and three for socioeconomic status.

The Cross-Sectional Score is calculated by comparing the current year's rate for each reporting unit to its associated benchmark. Each reporting unit is assigned a 1–5 star rating for each measure and social group combination. Values for Black, Hispanic and Asian/Pacific Islander groups are averaged by measure, and measure scores are composited by averaging the star ratings for all measures (separated by race/ethnicity and socioeconomic status). Each reporting unit has a race/ethnicity- and income-based Cross-Sectional Score based on the current year's rates, relative to a national benchmark, where higher scores represent greater overall health equity.

The Between-Plan Improvement Score follows a similar pattern. In this step, the HESS subtracts the prior year's benchmark from the current year's benchmark (by measure and social group) to create an Improvement Benchmark. It does the same for each reporting unit's set of rates, and compares a reporting unit's improvement to the Improvement Benchmark (literally, a difference in differences). Values are clustered into a 1–5 star rating for each reporting unit by measure and social group. Values for non-White groups are averaged by measure, and all measure scores (separated by race/ethnicity and socioeconomic status) are composited by a simple average. Higher values represent greater improvement in health equity over time, relative to a national benchmark.

The Within-Plan Improvement Score is similar conceptually to Humana's strategy, with the additional component of year-over-year change. The HESS uses regression techniques to identify the leading social group by race/ethnicity and socioeconomic status (calculated individually by plan and measure), which is then used to calculate another difference-in-differences value, comparing the change in the reference group's rates across two years with the change in each individual group. Values are clustered into a 1–5 star rating for each reporting unit by measure and social group. Ratings (by measure) for the non-leading racial groups are averaged and the measure ratings are composited. Higher values represent greater improvement in health equity over time, relative to the performance of a reporting unit.

These six scores are then aggregated as follows. Within-Plan and Between-Plan Improvement Scores for race/ethnicity are averaged to estimate an overall Improvement Score, as are the equivalent scores for income. Overall Improvement Scores are then averaged with their associated Cross-Sectional Scores to produce the Blended Scores for each social dimension, which are then averaged to generate a Multiple Risk Factor Score.

^D In the published example, to ensure large enough sample sizes, the authors use a four-year window of data, aggregating the first two years as the "prior" year and the last two years as "current."

ALTERNATIVE TECHNIQUES TO MEASURING EQUITY

In addition to the strategies evaluated above, geographic-based indices^E capture social structural components of inequality that also impact patient outcomes. Such indices measure multiple dimensions of socioeconomic and neighborhood indicators (housing, transportation, education) to quantify the quality of neighborhood resources by geographic unit. The Area Deprivation Index and Social Deprivation Index are two well-known examples, derived from factor analysis of American Community Survey data and summed for key geographic units (e.g., census tract, ZIP code).^{25,26} Ohio recently developed the Ohio Opportunity Index to synthesize dimensions like transportation, education, health, access and crime within the state.²⁷ This led to development of the Ohio Children's Opportunity Index, which includes neighborhood conditions and opportunities associated with health and wellness for pediatric populations.²⁷

Such indices have been used primarily by health services researchers to study the relationship between neighborhood characteristics and health. They have also been used by policymakers to risk-adjust bonus payments and similar financial incentive structures for working with patients who experience greater social risk factors.²⁸ Using a measure of area deprivation in risk-adjustment acknowledges the impact of social forces on health outcomes by reducing financial penalties for providers whose populations have a larger proportion of patients with social risk factors. But although the indices could be used in the metrics above, they have a limited ability to compare health plans on health equity outcomes and are not well-suited for benchmarking.

^E *The methodological approach is informed by prior research on measuring small area-level deprivation in the U.K. (Noble et al., 2006).*



Discussion

The following sections review the relative strengths and weaknesses of the health equity rating strategies discussed, and how each uses and incorporates the key dimensions discussed previously.

UTILIZATION OF SOCIAL GROUPS

We believe intersectional approaches to treating inequality are preferable to those that treat inequality in discrete or isolated ways. In this regard, the HEM and Humana approaches perform best. Honorable mention might go to the HESS, which incorporates two dimensions of inequality (race/ethnicity, socioeconomic status), although it treats them discretely until the end of the calculations.

The PHPI only handles one dimension of social inequality at a time, and treats this dimension in an exclusively binary manner. This means that dimensions such as race and ethnicity, with their multiple categories and distinct experiences, would be less nuanced than in other strategies. Similarly, dimensions with multiple ranked options (e.g., education, income) must find an appropriate point to split the scale. We are unsure how to overcome the challenge of binarizing social dimensions.

The choice of reference group—whether made a priori or data-driven—should be appropriate to the situation in which it is used. The PHPI uses a data-driven approach, while HEM and Humana use an a priori strategy. The HESS uses an a priori strategy for certain scores and a data-driven strategy for one score.

UTILIZATION OF HEALTH METRICS AND COMPOSITES

The primary benefit of a composite is a single score that reflects multiple aspects of health outcomes. As long as the distinct measures in the composite make sense together, the composite score is more robust than single-measure values and easier to interpret. Both the Humana approach and the HESS utilize composite scoring, although they incorporate it at different points in the process (Humana, early on; the HESS, roughly in the middle). Both also indicate flexibility in the set of measures included, to accommodate different needs.

Although the HEM and the PHPI use only one health outcome measure at a time, however, they may still be useful for state Medicaid programs that identify specific focus areas, such as child health and corresponding health care quality measures that align with equity goals. If the same dimensions of inequality are used across multiple health outcome measures with either technique, a last step could be to average the final scores for a composite based on multiple health outcomes.

USING BENCHMARKS

Performance on key metrics indicates what is functionally possible, and is essential for accountability. Benchmarks help set clear performance goals based on performance of an entity's peers; they establish points of comparison to support use as contracting targets, allowing value-based payment to incentivize based on performance goals. Leveraging social risk stratification in combination with benchmarks can provide key insights on gaps in health outcome measures across patient populations, particularly across populations with different social risk factors. These insights can equip policymakers with information on areas that have the largest health equity gaps.

Both the PHPI and the HESS incorporate benchmarks: The PHPI uses the entity with the highest inequality rate; the HESS uses a cross-sectional weighted average, stratified by key dimensions of inequality. Conceptually, the PHPI evaluates how much better an entity performs relative to the worst performer. The HESS evaluates how much better (or worse) an entity performs relative to a nationwide average for a particular social group. It would also be possible to use a best-performing benchmark, although none of the techniques we review here do so.

CALCULATION CONSIDERATIONS

It is worth noting the mathematical and conceptual realities behind the strategies reviewed. When factors are more or less equal, it is best to use the simplest approach, or the one with the most intuitively clear outcome.²⁹ Equity efforts require support and adoption by a wide audience such as policymakers, legislators, clinicians and patients, not only by the quality measurement community. Simpler methods can facilitate this. The PHPI is especially simple in both concept and mathematics. The HEM and the Humana approach require a few more mathematical steps, but are overall relatively straightforward to understand and calculate, although a notable drawback of the HEM is the need for individual patient health outcomes to properly calculate the metric.

The HESS is arguably the most robust strategy discussed. It simultaneously accounts for between- and within-unit comparison, cross-national benchmarking and year-over-year improvement. It utilizes multiple health outcome measures and is adaptable to expanding or modifying the measure set. The HESS has a significant limitation, however: computational complexity. While the outcome score is intuitively clear (high values mean greater health equity), the procedure to arrive at that score requires significant statistical and data management skills. The HESS is also prone to disruption in calculation if the prior year's data are missing.



Conclusion

No single strategy we reviewed for measuring equitable health care quality performs well on all dimensions, although several show promise across multiple dimensions. Selecting the “best” strategy might be a matter of perspective, and might rely on a mix of dimensions from multiple strategies. A strategy should take an intersectional approach to inequality, utilize clear comparison benchmarks and be relatively straightforward, both conceptually and mathematically. The use of composites across multiple health outcome measures can enhance a health equity metric, but should align with user needs.

Although the strategies presented in this brief are the most promising currently available, they do not represent all possible approaches—but they do present an opportunity for further testing. The HESS and Humana strategies were the only approaches designed for and used with health plan data. As a critical next step toward precise comparison, researchers should test the HEM and PHPI for validity, reliability and feasibility for use with health plan data. These strategies could also be field-tested through a program evaluation to assess variations in risk-adjustment based on their health equity ratings. Pilot tests should evaluate key dimensions, particularly user decisions regarding reference group selection.

From a policy perspective, these strategies should also be evaluated for how well they can measure equitable health care over time, and for their impact on health care delivery payment structures and health system changes. These foundational next steps can support strategy refinement and respond to current demand for integrating an appropriate measure of equitable health care quality to enhance health care services and experiences for priority populations.



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