

The Health and Well-being of an ACO Population

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Although valid measures of health and well-being have been proposed, tested, and implemented by various organizations, HealthPartners has been unable to find a feasible set of measures that would meet its needs as a health plan striving to improve its performance on the population health component of the Triple Aim.¹ Therefore, the health plan developed its own summary measures of health and well-being for adults that are composed of 3 scores: a current health score, a future health score, and a well-being score (Table 1). The current health score is the complement of disability-adjusted life-years (DALYs) and is composed of the disease burden due to mortality before age 75 years and morbidity.^{2,3} The future health score has 2 components. One is based on 6 member-reported behaviors (physical activity, eating fruits and vegetables, tobacco use, alcohol use, adequate sleep, and healthy thinking). The other is an age- and sex-specific preventive services score that is based on the performance of the medical group to which the health plan attributes the member. The elements of this measure are consistent with the Healthcare Effectiveness Data and Information Set 2016 preventive services measures. The well-being score is based on a single question that is used by the Organization for Economic Co-operation and Development and is considered valid by experts in the field of subjective well-being: “How satisfied are you with your life?”^{4,5} Because HealthPartners can link survey responses to claims data, the summary measures of health and well-being allow it to measure its performance in greater detail than is possible with publicly reported measures like the County Health Rankings or proprietary measures like the Gallup-Sharecare Well-Being Index.^{6,7} HealthPartners will use the measures to guide its strategic planning of health and well-being initiatives and to track its progress on the population health component of the Triple Aim.

METHODS

The HealthPartners Member Population

We conducted the analyses that we report here to improve HealthPartners' operations, quality management, and member

ABSTRACT

OBJECTIVES: To identify opportunities to improve the health and well-being of members of HealthPartners, a health plan based in Minnesota.

STUDY DESIGN: Cross-sectional analysis of insurance claims, death records, and survey data.

METHODS: We calculated a current health score from insurance claims and death records for all 754,584 members 18 years and older who met inclusion and exclusion criteria for the period January 1, 2015, to December 31, 2015, and/or January 1, 2016, to December 31, 2016. Adjusting responses to represent the member population, we calculated a future health score based on 7 items and a 1-item well-being score from survey data that we collected between July 1, 2015, and December 31, 2016.

RESULTS: Forty-four percent of the loss to the current health score among HealthPartners members is attributable to musculoskeletal, psychosocial, and neurologic conditions. Among the 7 components of the future health score, the greatest opportunity for improvement (31% of the total potential) is increasing dietary fruits and vegetables. Although 42% of the members reported high levels of well-being, 14% reported low levels. On average, members with the lowest levels of well-being were insured by a Medicaid product and had low educational achievement.

CONCLUSIONS: By applying the summary measures of health and well-being to the HealthPartners member population, we identified opportunities to address conditions that created a high burden on current health, opportunities to improve prospects for future health, and subpopulations who would benefit from interventions that would increase their sense of well-being.

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care and experience. They are based on 754,584 health plan members who met the following criteria: (1) continuously enrolled (with allowance for a 30-day gap in insurance coverage or discontinuance of enrollment due to death); (2) enrolled during the period January 1, 2015, to December 31, 2015, and/or January 1, 2016, to December 31, 2016; and (3) 18 years or older without upper limit. Among the members meeting these criteria, we excluded (1) members known to prefer a language that is not English; (2) members with an address of a correctional facility, nursing home, or hospice; and (3) the 0.2% of members whose names appear on the health plan, research, or related do-not-contact lists.

We based the current health score on all member insurance claims and death records for the defined period. We based the future health score and well-being score on responses to the member survey. Each month, we asked a stratified random sample of members who met the inclusion and exclusion criteria described above to complete a mail survey. We contacted nonresponders by telephone. We designed the survey sample to account for differential nonresponse (ie, by gender, age, and type of insurance product) that was present in a pilot survey of a similar population. We oversampled Medicaid members so that we would have an adequate number of responses to compare with those of members insured through commercial products or Medicare. We asked the survey respondents to self-identify their ethnicity, race, and education. However, we only report non-Hispanic white versus all other categories at this time because the number of respondents is not large enough to make more detailed ethnicity or race comparisons meaningful.

Over the period of interest, the survey response rate averaged 39.0%. We based our current analysis on 9144 survey responses and insurance claims of 754,584 individuals. We reweighted the survey responses to reconstruct the member population that met our inclusion and exclusion criteria. The attributes of the reconstructed population fall within 0.3 percentage points of the actual population, except for insurance product, for which the difference is 1 percentage point.

Calculating DALYs and the Current Health Score

As we described in detail in another publication,⁸ the HealthPartners current health score is composed of the burden of morbidity (years lost to disability [YLDs]) and mortality (years of life lost [YLLs]) on the population. To identify the burden that specific conditions put on the population as morbidity (YLDs), we assigned Global Burden of Disease (GBD) condition weights⁹ to HealthPartners insurance

TAKEAWAY POINTS

We assessed HealthPartners members' health and well-being for the period July 1, 2015, to December 31, 2016, and found that:

- ▶ Three broad classes of conditions—musculoskeletal, psychosocial, and neurologic conditions—are responsible for 44% of the loss in the current health score.
- ▶ Increasing healthy eating is the greatest opportunity to improve the future health score.
- ▶ Although 42% of the members reported a high level of well-being, 14% reported a low level of well-being.

These data provide a baseline and strategic guidance as HealthPartners works to improve the health and well-being of its members, patients, and community.

TABLE 1. Summary Measures of Health and Well-being Data Elements and Scoring

Measure Name	Measure Components	Score
Current health	The complement of DALYs multiplied by 100	Continuous (0-100)
Future health	Member-reported behaviors, including physical activity, diet (fruits and vegetables), tobacco use, alcohol use, adequate sleep, and healthy thinking	Ordinal (0, 1)
	Up to date on age- and sex-appropriate preventive services (performance average by attributed medical group): cholesterol screening, colon cancer screening, mammogram, cervical cancer screening, chlamydia screening, pneumococcus immunization, blood pressure measurement, and tobacco use screen and advise	Continuous (0-1)
Well-being	Member-reported life satisfaction	Continuous (0-10)

DALY indicates disability-adjusted life-year.

claims grouped by the Johns Hopkins ACG [adjusted clinical group] System expanded diagnostic clusters (EDCs) and major expanded diagnostic clusters (MEDCs).¹⁰ YLDs for an individual can range from 0 for an individual who has no insurance claims during a year to 1. When a member's claims tracked to more than 1 EDC within an MEDC, we attributed the disease burden to the EDC with the largest GBD weight, and we only counted 1 weight within an MEDC for a particular member. We used the method described by Kottke et al to calculate the DALYs due to morbidity for members who had claims in more than 1 MEDC so that a member could not have a YLD value greater than 1.¹¹ Although the choice of the age used to calculate YLLs is arbitrary and the GBD collaborators use the age of 86 years for life expectancy,¹² we elected to follow the convention of the County Health Rankings⁶ and calculate the mortality burden from death as YLLs before age 75 years. To calculate the DALYs attributable to an MEDC (eg, musculoskeletal), we summed all the YLDs and YLLs attributable to the MEDC.

We created the current health score for individuals by calculating the complement of that individual's DALYs multiplied by 100. For example, there were 232,720 DALYs lost by the 754,584 individuals in the population, yielding an average DALY loss of 0.31. The current health score would be 69. We divided the DALYs attributable to an MEDC by the total DALYs for the population and multiplied by 100 to generate the loss to the current health score attributable to the MEDC.

METHODS

Calculating the Future Health Score

The HealthPartners future health score has 2 components: a behavior component based on survey responses (the items and pass criteria are available in [eAppendix A](#) [eAppendices available at [ajmc.com](#)]) and a preventive services component. The potential range of the score is 0 to 7. Being most interested in knowing the number of individuals who might benefit from a particular behavior change intervention and wanting to keep the measures easy for the end user to understand, we gave each behavior a score of 1 if present and 0 if absent, rather than assigning a weight based on an association with an outcome variable.

The preventive services score is specific to the member's age and sex, has a range of 0 to 1, and is based on their medical group's performance on the 2015 adult primary care and obstetrics/gynecology preventive services score that HealthPartners reports in its annual clinical indicators report.¹³ However, not all medical groups see enough HealthPartners members to be scored, and some patients have not been seen by a medical group that has been scored. If we have attributed a patient to a medical group to which we have given a preventive services score, we gave the patient the same score as we gave the medical group. If we have not given a member's attributed medical group a score, we gave the member the average of all medical groups with a score, without accounting for the member's age or sex. Finally, if a member has not had a claim in 2 years, we gave them a score of 0.

We adopted this scoring system because some preventive services (eg, screening for colon cancer with colonoscopy) are indicated very infrequently and others (eg, screening mammography) depend on risk factors, like family history or member preference, that are not captured by claims data.

Calculating the Well-being Score

We used the member survey as the data source of the well-being score. The survey offers the respondent a response scale with a range of 0 to 10 to the question, "How satisfied are you with your life?" We arbitrarily defined a response of 9 or 10 as a high level of well-being, a response of 7 or 8 as a moderate level of well-being, and a response of 0 to 6 as a low level of well-being.

Statistical Methods

We tested the relationships among the 3 health score components and demographic variables of age, gender, race, education, and Medicaid coverage using approaches appropriate for the various types of distributions encountered in these metrics and covariates. We report the relationships among demographic variables and the future health score from a general linear model using SAS Proc Genmod (SAS Institute; Cary, North Carolina). We employed nonparametric methods to test relationships among well-being and the current health score with the other measures due to violation of normality assumptions. We used the Kruskal-Wallis test to report relationships with categorical variables, and we used Spearman correlations to test relationships with ordinal

measures. We used logistic regression to evaluate the probability of being a nonuser—that is, having no insurance claims during the period of interest. We used bootstrapping¹⁴ to draw 1000 random samples of 300 members from the weighted data to estimate 95% CIs. We used SAS version 9.4 (SAS Institute; Cary, North Carolina) to conduct the analyses. The HealthPartners Institutional Review Board has determined that this analysis constitutes quality improvement.

RESULTS

Population Attributes

The HealthPartners member population is relatively young, non-Hispanic white, and educated ([Table 2](#)). Just 10% are 65 years or older. Slightly more than half are women, and the majority are non-Hispanic and white. Fewer than 15% of the members lack some college or technical school, and more than half have a college degree or an advanced degree. Nearly 90% of the members are insured through a commercial product; relatively similar proportions of the remaining members are insured through Medicare or a Medicaid program, including Minnesota Seniors Health Option.

Current health scores. The current health score declines significantly with age ($P < .0001$ for trend), and men have a higher score than women. Non-Hispanic white members have a lower current health score than members of other ethnic groups and races. The current health score rises with increasing education ($P < .0001$ for trend). Members insured through Medicare have the lowest current health score ($P < .0001$ vs other products).

When statistically adjusted for age, the difference in the current health score between men and women persists. When statistically adjusted for age and sex, differences in the current health score between non-Hispanic whites and the group of members of any other race or ethnicity do not persist.

Future health scores. Mean future health scores are significantly lower for members aged 50 to 64 years compared with the other age groups. The future health score is significantly greater for women than for men. Likewise, the trend for the future health score to increase with increasing education is statistically significant ($P < .0001$ for trend). Non-Hispanic white members have a higher future health score than members of other ethnic groups and races. Members insured through a Medicaid program have significantly lower future health scores than members insured through Medicare or commercial products. When statistically adjusted for sex, the difference in the future health score between non-Hispanic white members and the group of members of any other race or ethnicity persists ($P = .0045$).

Well-being scores. Although the well-being score does not differ significantly by age, sex, or race/ethnicity, the increase in well-being scores associated with increasing education is statistically significant ($P < .0001$). Members insured by a Medicaid program have significantly lower well-being scores compared with members insured through Medicare or a commercial insurance product.

TABLE 2. Demographic Characteristics of the Reconstructed Population With Summary Measures of Health and Well-being Scores (N = 754,584)

	n	% of Members	Current Health Mean [95% CI]	Future Health Mean [95% CI]	Well-being Mean [95% CI]
Age in years					
18-29	162,236	21.5	80 [74-85]	4.49 [4.44-4.54]	8.03 [7.60-8.45]
30-39	142,048	18.8	74 [67-81]	4.47 [4.40-4.53]	8.06 [7.63-8.44]
40-49	130,728	17.3	72 [64-79]	4.48 [4.42-4.55]	8.00 [7.54-8.43]
50-64	243,359	32.3	64 [54-71]	4.39 [4.34-4.43]	7.99 [7.64-8.29]
≥65	76,213	10.1	49 [20-62]	4.48 [4.40-4.56]	8.11 [7.41-8.70]
Sex					
Female	388,608	51.5	65 [59-70]	4.58 [4.55-4.62]	8.04 [7.78-8.29]
Male	365,976	48.5	73 [59-79]	4.30 [4.27-4.34]	8.00 [7.71-8.26]
Race and ethnicity^a					
White, non-Hispanic	647,687	85.8	69 [60-72]	4.47 [4.44-4.49]	8.03 [7.85-8.22]
All other race and ethnicity categories	106,897	14.2	73 [64-81]	4.35 [4.29-4.42]	7.96 [7.37-8.53]
Education^b					
No college or technical school	104,864	13.9	65 [45-75]	3.98 [3.92-4.05]	7.78 [7.13-8.38]
Completed some college or technical school	255,018	33.8	69 [63-75]	4.33 [4.28-4.37]	7.98 [7.65-8.28]
Completed college or advanced degree	384,115	50.9	70 [64-75]	4.68 [4.64-4.71]	8.13 [7.91-8.36]
Insurance					
Commercial	667,926	88.5	71 [70-73]	4.47 [4.44-4.50]	8.06 [8.02-8.10]
Medicare	47,412	6.3	43 [39-48]	4.47 [4.37-4.57]	8.02 [7.87-8.18]
Medicaid products ^c	39,245	5.2	63 [61-65]	4.05 [3.99-4.11]	7.43 [7.32-7.53]

^aA total of 2.0% of respondents did not provide ethnicity or race data.

^bA total of 1.4% of respondents did not provide education data.

^cIncludes Minnesota Seniors Health Option.

Overall Summary Measure Score Values

The overall average current health score is 69 (95% CI, 62-73) for the 754,584 members as a group during this period (Figure). The musculoskeletal, psychosocial, and neurologic MEDCs are the leading causes of loss to the current health score. The future health score averages 4.45 (95% CI, 4.42-4.48) of a maximum possible score of 7.0. Increasing fruit and vegetable consumption and increasing healthy thinking present the greatest opportunities to improve the future health score. For the well-being score, 42% of the population reported high well-being, 44% reported moderate well-being, and 14% reported low well-being.

Relationships Between the Number of Members With a Claim and the Current Health Score

The correlation between the number of members with a claim associated with an MEDC and the DALYs associated with an MEDC was 0.52 (P < .006). The MEDCs with the greatest number of members with a claim were administrative, musculoskeletal, eye, and skin (Table 3). These 4 MEDCs accounted for 26.2% of the DALYs. Claims for preventive services contributed to the large number of claims in the administrative MEDC but did not generate DALYs. Musculoskeletal, psychosocial, and neurologic were the MEDCs that caused the most loss to the current health score—44.8% of all loss when taken together.

Associations Among the Health and Well-being Scores

Twelve percent of HealthPartners members have a current health score of 30 or less (Table 4); 34% of the DALYs are attributable to this group of members. At the other end of the spectrum, 34% of the members have a current health score that is greater than 90; their experience accounts for 2% of the DALYs. The remaining DALYs are fairly evenly distributed among the members who have a current health score between 31 and 80. Although the association of the overall future health score with the current health score is relatively weak (r = 0.021; P = .042) due to a statistically significant negative association of the preventive services component with the current health score (r = -0.177; P < .001), the association of the behavior component with the current health score is statistically significant while weakly positive (r = 0.050; P < .0001). The increase in the well-being score with an increasing current health score is nearly monotonic and is statistically significant (r = 0.093; P < .001).

Only 16% of the members have a future health score of 0 to 3 (eAppendix B Table 1). More than 75% of the members have a future health score in the range of greater than 3 to 5, and only 7% of the members have a future health score greater than 5 to 7. The well-being score increases monotonically by more than 1.5 points as the future health score increases (r = 0.296; P < .0001).

METHODS

TABLE 3. Number of Individuals and DALYs, Contribution of Each MEDC to Loss in the Current Health Score,^a and Contribution of Each MEDC to Total Costs

MEDCs	Individuals With 1 or More Claims in the MEDC (n)	DALYs Associated With the MEDC	Contribution of the MEDC to Loss in the Current Health Score ^a (%)	Contribution of the MEDC to Total Costs (%)
Musculoskeletal	270,536	48,018	20.6	15.7
Psychosocial	172,857	32,115	13.8	5.8
Neurologic	172,338	24,196	10.4	6.4
General surgery	170,794	17,505	7.5	6.4
Malignancies	35,348	15,802	6.8	7.6
Respiratory	171,178	11,287	4.9	4.9
Cardiovascular	207,309	10,765	4.6	8.0
General signs and symptoms	169,346	9894	4.3	3.1
Eye	229,131	9519	4.1	2.6
Gastrointestinal/hepatic	117,946	8658	3.7	4.3
Female reproductive	118,490	8057	3.5	5.9
Rheumatologic	24,121	7252	3.1	1.0
Endocrine	96,363	6739	2.9	4.0
Genitourinary	90,123	6011	2.6	2.1
Renal	28,121	3440	1.5	3.5
Skin	210,550	3409	1.5	2.2
Nutrition	72,017	2620	1.1	0.4
Infections	39,369	1785	0.8	2.0
Hematologic	32,073	1222	0.5	0.8
Toxic effects and adverse events	20,396	870	0.4	1.5
Ear, nose, and throat	141,107	862	0.4	1.1
Reconstructive	22,376	854	0.4	0.5
Allergy	48,041	800	0.3	1.0
Administrative (includes preventive services)	459,265	592	0.3	8.8
Dental	13,135	246	0.1	0.1
Genetic	7497	203	0.1	0.2
Nonuser (no claims submitted)	131,892	0	0.0	0.0
Total	754,584	232,720		100.0

DALY indicates disability-adjusted life-year; MEDC, major expanded diagnostic cluster.

^aLoss in the current health score is equal to DALYs associated with an MEDC divided by the total DALYs lost, which in this case are 232,720.

DISCUSSION

From our analysis of all 754,584 member claims, we found that 3 broad classes of conditions—musculoskeletal, psychosocial, and neurologic—are responsible for 44% of the loss in the current health score. Within these broad categories and in order of descending burden, the leading musculoskeletal conditions are generalized musculoskeletal conditions, lower back pain, and cervical spine pain; the leading psychosocial conditions are anxiety and depression; and the leading neurologic conditions are headache, migraine, and head injury. From survey responses given by a randomly selected sample of members, we

found that increasing healthy eating, as indicated by whether the member meets the goal of eating 2 servings of fruit and 3 servings of vegetables every day, is the greatest opportunity to improve the future health score. Finally, we found that although 42% of the members reported a high level of well-being, 14% are apparently suffering as they reported a low level of well-being. These data provide a baseline as HealthPartners works to improve health and well-being in partnership with its members, patients, and community.

Our analysis also suggests that small changes in behavior might lead to a large improvement in current health. We calculated that a 1-point increase in the mean future health score could be associated with a reduction in 13,084 DALYs (eAppendix B), an amount that is greater than the total number of DALYs attributed to either respiratory or cardiovascular conditions. The information provided by the summary measures of health and well-being is revealed neither by analyzing the frequency of claims nor by analyzing the cost of care for particular conditions. It will provide significant guidance as HealthPartners develops its strategic initiatives to improve population health.

The well-being measure provides important information about the social determinants of well-being: Among HealthPartners members, education and the adequacy of financial resources (using Medicaid as a proxy) are strongly linked to well-being. These insights compel the organization to continue its many initiatives to increase health equity.¹⁵⁻¹⁷ If it were to rely on publicly available social indicators, HealthPartners would not have the same level of insight or be able to track its progress at a level of detail it would find sufficient.

Limitations

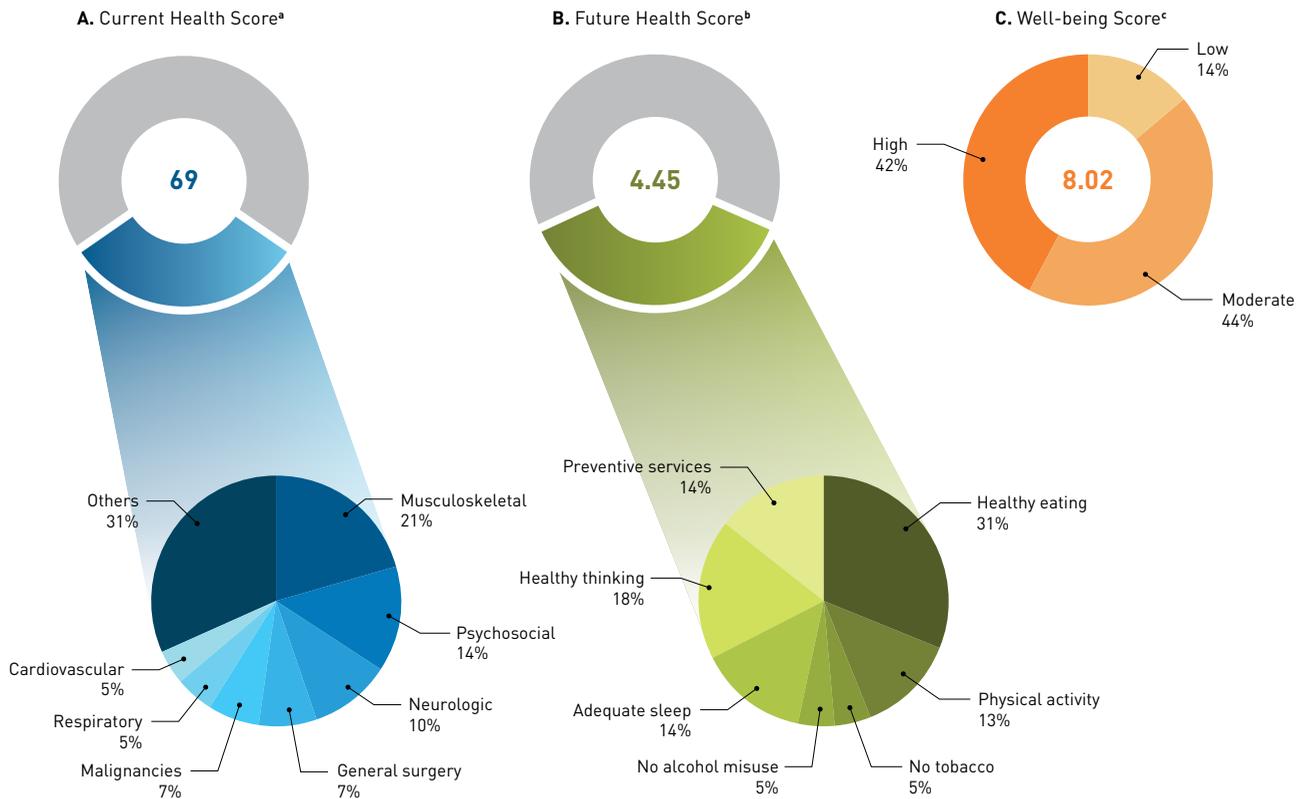
We acknowledge that HealthPartners' summary measures of health and well-being have many limitations. The current health score, based on insurance claims, can be biased by both differential access to care and a member's propensity to seek care. The future health score and the well-being score are both based on limited information. We acknowledge that more information in each of the scores would increase their accuracy, but we found that our initial, more extensive survey resulted in unacceptably low response rates that we could not increase by any feasible means. Even with the response rates that we are getting with a brief survey, bias is possible if the members who are suffering the most are also the ones who are least likely to respond. Better calibration would

TABLE 4. Distribution of Members and DALYs Along With Future Health and Well-being Scores by Current Health Score Deciles

Current Health Score Stratum	Members n (%)	Current Health Score	DALYs n (%)	Future Health Score (7 components total)	Future Health Score (preventive services component only)	Future Health Score (6 behavior components only)	Well-being Score Mean (95% CI)
		Mean (95% CI)		Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	
0-30	88,021 (12)	11 [-50 to 19]	78,574 (34)	4.25 (4.17-4.32)	0.72 (0.69-0.75)	3.53 (3.45-3.60)	7.43 (6.77-8.09)
31-40	42,967 (6)	35 (34-37)	27,733 (12)	4.42 (4.31-4.53)	0.72 (0.68-0.77)	3.70 (3.59-3.80)	7.73 (6.88-8.51)
41-50	54,671 (7)	45 (44-46)	30,057 (13)	4.42 (4.33-4.51)	0.71 (0.67-0.76)	3.71 (3.61-3.80)	7.93 (7.22-8.53)
51-60	67,222 (9)	55 (54-56)	30,073 (13)	4.54 (4.46-4.63)	0.71 (0.68-0.74)	3.83 (3.75-3.92)	8.04 (7.37-8.64)
61-70	69,301 (9)	65 (64-66)	23,972 (10)	4.53 (4.44-4.61)	0.71 (0.67-0.75)	3.82 (3.73-3.90)	7.97 (7.24-8.59)
71-80	100,816 (13)	75 (74-76)	24,951 (11)	4.53 (4.46-4.59)	0.70 (0.67-0.73)	3.82 (3.76-3.89)	8.07 (7.60-8.52)
81-90	78,159 (10)	85 (84-86)	11,758 (5)	4.53 (4.46-4.60)	0.70 (0.64-0.74)	3.83 (3.76-3.91)	8.18 (7.62-8.72)
91-100	253,426 (34)	98 (98-99)	4806 (2)	4.43 (4.39-4.48)	0.56 (0.50-0.61)	3.87 (3.83-3.91)	8.25 (7.96-8.52)
Total	754,584 (100)	69 (62-73)	231,925 (100)	4.45 (4.42-4.48)	0.66 (0.64-0.68)	3.79 (3.65-3.92)	8.02 (7.84-8.21)

DALY indicates disability-adjusted life-year.

FIGURE. Summary Measures of Health Scores for the Population of 754,584 Members for the Period July 1, 2015, to December 31, 2016



^aThe overall average current health score for 754,584 members during the period of interest was 69 [95% CI, 62-73]. The conditions that place the largest burden on current health are in the musculoskeletal, psychosocial, and neurologic major expanded diagnostic clusters and are followed by general surgery, malignancies, respiratory conditions, and cardiovascular conditions.

^bThe overall average future health score for 754,584 members during the period of interest was 4.45 [95% CI, 4.42-4.48]. The greatest opportunities to improve the score were with healthy eating and healthy thinking.

^cThe overall average well-being score for 754,584 members during the period of interest was 8.02. A total of 42% of the population reported high well-being, as defined by a score of 9 or 10; 44% reported moderate well-being, as defined by a score of 7 or 8; and 14% reported low well-being, as defined by a score of 0 to 6.

also increase our confidence in our scores. Finally, at this time, we do not have enough survey responses to analyze scores by ethnicity and race, but our capability will increase as we continue to survey our members.

CONCLUSIONS

We believe that, if applied widely, the HealthPartners measures could help guide national efforts to improve population health and well-being, and we invite others to test the validity and reliability of our methodology. If accountable care organizations and other healthcare organizations would collect, report, and use a uniform set of summary measures of health and well-being, they would not only be able to track their own progress in the populations that they serve, but they would also make a significant contribution to implementing the recommendations made in the 2011 report *For the Public's Health: The Role of Measurement in Action and Accountability*.¹⁸ When aggregated, the measures could guide regional and national efforts to improve population health and well-being because nearly 90% of Americans are now registered with a health plan.¹⁹ ■

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The “pass” criteria for each of the sustainability components:

- **Healthy eating:** Members who eat five or more fruits and vegetables in a typical day.
- **Physical activity:** Minutes of moderate physical activity plus twice the minutes of vigorous physical activity per week equal to or greater than 150. (i.e., the Surgeon General’s definition of adequate physical activity).
- **Tobacco:** No tobacco use.
- **Alcohol cessation:** Female respondents who reported consuming 7 servings or less of alcohol per week. Male respondents who reported consuming 14 servings or less of alcohol per week.
- **Sleep:** Reporting between 7 and 9 hours of sleep per night.
- **Healthy Thinking:** Members who answered ‘**often**’ to the question “*I take the time to think about the good things that happen to me*”.
- **Preventive care metric:** Clinical Indicator’s Preventive care (Adult & OB) rates at medical group level were assigned to members attributed medical group.

eAppendix B.

eAppendix B Table 1. Number of members and well-being score means for the future health score groupings

Future health score range	Members, N (%)	Well-being score, mean (CI)
0 to 3	121,148 (16%)	7.21 (6.61-7.79)
>3 to 4	194,445 (26%)	7.74 (7.36-8.12)
>4 to 5	231,792 (31%)	8.16 (7.88-8.46)
>5 to 6	153,425 (20%)	8.54 (8.23-8.85)
>6 to 7	53,774 (7%)	8.79 (8.28-9.27)
Total	754,584 (100%)	8.02 (7.84-8.21)

eAppendix B Table 2. Calculation worksheet for the potential reduction in DALYs with a one-point increase in future health score

Number of behaviors	Sample N	Reconstructed N	DALYS in the stratum	DALYS per person	Change in behavior count	Associated decrease in DALYs	Potential impact
0	31	2,119	566.34	0.2673			
1	307	23,009	8427.3	0.3663	0 to 1	0.0990	210
2	1081	83,168	29147.76	0.3505	1 to 2	(0.0158)	(363)
3	2298	189,028	61330.19	0.3245	2 to 3	(0.0260)	(2,164)
4	2839	239,217	72069	0.3013	3 to 4	(0.0232)	(4,382)
5	1921	161,328	44915.32	0.2784	4 to 5	(0.0229)	(5,469)
6	667	56,718	15468.78	0.2727	5 to 6	(0.0057)	(916)
Total	1,921	754,587	231,925	0.3074			(13,084)

*note that sums differ slightly from Table 2 in the publication because this analysis is based on reconstructed data

eAppendix B Figure. Graphical representation for the potential reduction in DALYs with a one-point increase in future health score

