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Update to the Report of Nationally Representative Values for the Non-institutionalized US Adult Population for Five Health-Related Quality of Life Scores

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Abstract

Objectives—The most recent reports of nationally representative health-related quality of life (HRQoL) values for the United States use data that were collected over a decade ago. We update these values using data from 2011, stratified by age and sex.

Methods—This study uses data from 2 sources—the 2011 Medical Expenditures Panel Survey (MEPS) and the 2011 National Health Interview Survey (NHIS). Both are nationally representative surveys of the US non-institutionalized civilian population. The MEPS was used to calculate four HRQoL scores: categorical self-rated health, mental and physical component summaries from the SF-12, and the SF-6D. We also estimated Quality of Well-being scale scores from the NHIS. We report means and quartiles for all continuous scores, stratified by decade-of-age and sex.

Results—There were 23,906 eligible subjects in the 2011 MEPS and 32,242 eligible subjects in the 2011 NHIS. All age and sex categories had instrument completion rates above 84%. Females reported lower mean scores than males across all ages and instruments. In general, those in older age groups reported lower scores than younger age groups, with the exception of the mental component summary from the SF-12. When compared to prior reports, these new values were generally lower than prior reports but rarely reached minimally important difference criteria.

Conclusions—This report updates US nationally representative age- and sex-stratified estimates for five HRQoL scores using data from 2011. These values are important for use in both generalized comparisons of health status and in cost-effectiveness analyses.

Keywords

Health status; quality of life; surveys and questionnaires; United States

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Introduction

Standardized health-related quality of life (HRQoL) measures are used to describe health status and measure health changes over time in both individuals and groups. Standardization ensures comparability across different studies, and generic HRQoL measures are important for comparisons across different diseases and health conditions. Generic HRQoL measures with algorithms that yield utility scores are appropriate for constructing quality-adjusted life years to inform decision making, as well as for cost-effectiveness analyses.[1] Several reports by the Institute of Medicine have called for the use of standardized measures of population health to track the wellness of the populations over time[2]. However, we still do not have a standardized population health metric for the US population.

Some generic HRQoL measures have been included in US nationally representative datasets[3]. As a step towards quantifying US population health, we previously published a catalog of values representative of the US non-institutionalized civilian population using data collected in 2001 in the Medical Expenditures Panel Survey (MEPS) and the National Health Interview Survey (NHIS).[3–5] The data collected in 2011 were recently released, so we report 10-year updates for five of the HRQoL measures included in the prior catalog: categorical self-rated health, mental and physical component summaries from the SF-12,[6] an estimated Quality of Well-being (QWB) score,[7] and the SF-6D.[8]

Methods

Subjects

This study uses data from 2 sources—the 2011 MEPS and the 2011 NHIS. Both are nationally representative surveys of the US non-institutionalized civilian population. The NHIS is an interviewer-administered, cross-sectional household survey, which gathers information on all household members with detailed information about one adult and one child per household. The detailed information includes health status information used in this analysis. The NHIS sampling and interviewing are continuous throughout each year (see http://www.cdc.gov/nchs/nhis.htm).

The sampling frame of the Household Component of the Medical Expenditure Panel Survey (MEPS-HC) is drawn from respondents to the National Health Interview Survey. The MEPS-HC collects data from a nationally representative sample of households through an overlapping panel design. The two years of data for each panel are collected in five rounds of interviews. This provides continuous and current estimates of health care expenditures at both the person and household level for two panels for each calendar year. In 2011, the Self-Administered Questionnaire given to all adults aged 18 years or older in MEPS included the SF-12 v2™ and categorical self-rated health[9].

Measures

Mental Component Summary (MCS) and Physical Component Summary (PCS) —Self-Administered—Data were obtained using the Medical Outcomes Study 12 item Short Form (SF-12 v2™)[6] The 12 multiple-choice items of the SF-12 relate to eight health dimensions: physical functioning, physical role limitations, emotional role limitations, pain,

general health, vitality, social functioning, and mental health. The MCS and PCS were developed from reducing the eight dimensions to two dimensions using factor analysis. The factor scores were normalized so that both the MCS and PCS have averages of 50 and standard deviations of 10, with respect to the proprietary US national dataset held by QualityMetric, Inc. (Lincoln, RI)[10]. We included imputed scores that were calculated using a proprietary algorithm of QualityMetric, Inc. and in the MEPS dataset.

The SF-12 also includes the categorical self-rated health item, “In general, would you say your health is: Excellent, Very good, Good, Fair, or Poor?”.

Quality of Well-being (QWB) Scale (Estimated)—Interviewer Administered— The QWB Scale categorizes a respondent with respect to mobility, physical activity, social activity, and symptom/problem. Preference weights for each function level were derived from 867 raters, and a scoring algorithm was developed to yield scores between 0 and 1.[11] A QWB estimation (QWBx1) procedure has been developed from NHIS data recorded from 1979 to 1996[7]. NHIS data since 1997 contained questions on functional limitations that more closely match with the QWB social activity and physical activity subscales and the estimate algorithm was modified to reflect these changes. The modified algorithm can be accessed at http://www.pitt.edu/~jzh23/.

SF-6D—Self-Administered—The SF-6D scoring algorithm uses seven questions from the SF-12. These questions were used to construct health scenarios that were evaluated using the standard-gamble technique in a representative sample of the UK population[8]. Regression analysis was then used to model the preferences assigned to each health status. A utility-based score can be assigned to each health status using the resulting scoring algorithm with scores between 0 and 1.

Analyses

Data were analyzed using SAS 9.3 (Cary, NC) to allow adjustment for the complex sampling design of the MEPS and the NHIS. The reported results incorporate the sampling and post-stratification weights, yielding nationally representative estimates for non-institutionalized adults.

For categorical self-rated health, we report the full distribution of responses. For each continuous scale, we report the estimated mean value, 95% confidence interval around the mean estimate, and quartile-point estimates. All analyses were stratified by sex and decade of age.

Results

There were 23,906 eligible subjects in the 2011 MEPS and 32,242 eligible subjects in the 2011 NHIS. Supplemental Table 1 shows the number of respondents in each sample for each HRQoL measure stratified by age and sex. In general, instrument completion rates were very high, and all completion rates were above 84%. Imputation of the QWBx1 was completed for all respondents in NHIS.

Supplemental Table 2 presents the full distribution of categorical self-rated health responses stratified by age and sex. Females were less likely than males to report “excellent” self-rated health in all age groups. As age increased, the proportion of those who reported “excellent” and “very good” health decreased, while the proportion of those who reported “fair” and “poor” health increased in both females and males.

When categorical self-rated health results were compared to the results from 2001 data, there was an increase in “excellent” reports from 20- to 29-year-old females and males. Results from those aged 30–39, 40–49, and 50–59 were similar to results from 2001, though there was a small but consistent decrease in the proportion of males who reported “excellent” or “very good” health in these age groups. There was an increase in “excellent” and “very good” health responses in females and males aged 60–69, 70–79, and 80–89. For example, the proportion of 60–69-year-old females who reported “excellent” health was 9.0% in 2001 and 11.2% in 2011.

Results from the continuous HRQoL measures illustrate age- and sex-stratified mean scores (Table 1, Supplemental Table 3, and Figure 1). All scores are lower for females than for males. Older age groups reported lower PCS, SF-6D, and QWBx1 scores but higher MCS scores.

When comparing 2001 to 2011 results, mean scores for the QWBx1 were lower in 2011 than 2001 in all age groups under age 70 and slightly higher in the oldest age group, though none reached an MID of 0.03[12]. Mean scores for the SF-6D were lower in all age- and sex-stratified groups, with an MID of 0.03[13] reached in females aged 30–39, 40–49, and 50–59 and males aged 50–59. There were small differences in mean MCS and PCS though none reached a minimally important difference (MID) of 5 points[10]. Comparing results from 2001 to 2011 for SF-12 derived scores is somewhat problematic because 2001 used the SF-12 version 1, while 2011 used SF-12 version 2™. The first use of version 2 in MEPS was in 2003. When comparing 2003 to 2011 results, neither MCS nor PCS scores showed changes that reached MID.

Discussion

This report updates US nationally representative age- and sex-stratified estimates for five HRQoL scores using data from 2011. Consistent with prior reports, women generally reported lower HRQoL than men, and older individuals reported lower HRQoL than younger individuals. When compared to the 2001 catalog, younger age groups tended to report lower HRQoL and older age groups tended to report higher HRQoL. While the differences generally did not reach minimally important difference criteria, the change in reported health status may be important on a population level as HRQoL is a meaningful measure which has been shown to have a stronger association with survival than cardiovascular risk factors and other biologic measures[14].

Other than MEPS and NHIS, there are few other US nationally representative samples that include HRQoL measures. The National Health Measurement Survey collected data by telephone in 2005–2006 from a representative sample of adults aged 35–89 (including

categorical self-rated health, EuroQol-5D-3L, SF-36, Health Utilities Index Mark 2 and 3, QWB Scale)[4]. The Joint Canada/United States Survey of Health collected data by telephone in 2002–2003 for those aged 18 and older (categorical self-rated health, Health Utilities Index Mark 2 and 3)[15]. The US Valuation of the EuroQol EQ-5D Health States Survey collected self-administered information from those aged 18 and older in 2002 (categorical self-rated health, EuroQol-5D-3L, Health Utilities Index Mark 2 and 3[16]). Given that HRQoL scores are affected by measure,[17] mode of administration,[3] and year[18], continuing collection is necessary. Continued collection of these measures in large nationally representative datasets could inform researchers and policymakers about the selection of the most appropriate method for a national metric of population health.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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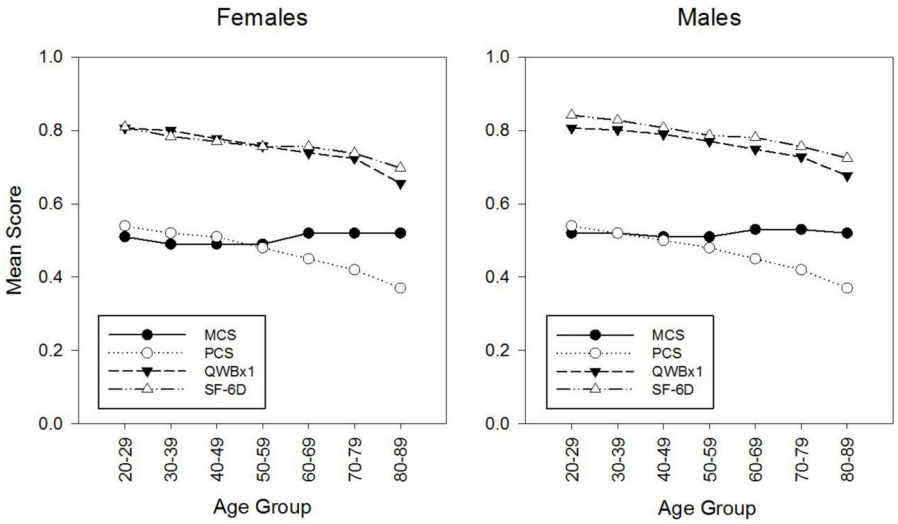

Figure 1. Age- and sex-stratified mean scores for the MCS, PCS, QWBx1, and SF-6D scores

MCS is the mental component summary score and PCS is the physical component summary score for the SF-12; these scores have been rescaled from 0–100 to 0–1.0 for illustration purposes. QWBx1 is the estimated Quality of Well-being scale and SF-6D is the Short form-6D from the SF-12.

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Table 1

Age- and Sex-Stratified Mean and 95% Confidence Interval (CI) for Each Continuous Health-Related Quality-of-Life Summary Score

		Females			Males		
Measure	**Age Group**	**Lower 95% CI**	**Mean**	**Upper 95% CI**	**Lower 95% CI**	**Mean**	**Upper 95% CI**
MCS (SF-12)	**20–29**	50.0	50.5	51.1	51.7	52.3	52.8
	30–39	48.7	49.2	49.7	51.2	51.6	52.1
	40–49	48.3	48.9	49.4	50.6	51.2	51.8
	50–59	49.2	49.8	50.4	50.6	51.1	51.6
	60–69	50.9	51.5	52.0	52.2	52.7	53.2
	70–79	51.1	52.0	52.9	51.8	52.6	53.4
	80–89	50.7	51.7	52.8	50.5	51.7	52.9
PCS (SF-12)	**20–29**	53.1	53.5	53.9	54.1	54.5	54.9
	30–39	51.5	52.0	52.4	52.6	53.1	53.5
	40–49	49.5	50.1	50.6	50.6	51.1	51.7
	50–59	47.0	47.6	48.2	48.2	48.8	49.4
	60–69	44.0	44.9	45.7	45.7	46.5	47.3
	70–79	40.8	41.7	42.6	42.2	43.2	44.1
	80–89	36.0	37.3	38.5	37.0	38.5	39.9
QWBx1	**20–29**	0.807	0.807	0.807	0.807	0.807	0.807
	30–39	0.800	0.800	0.800	0.802	0.802	0.802
	40–49	0.778	0.778	0.778	0.790	0.790	0.790
	50–59	0.758	0.758	0.758	0.771	0.771	0.771
	60–69	0.739	0.739	0.739	0.749	0.749	0.749
	70–79	0.724	0.724	0.724	0.728	0.728	0.728
	80–89	0.656	0.656	0.656	0.677	0.677	0.677
SF-6D	**20–29**	0.802	0.809	0.817	0.834	0.842	0.849
	30–39	0.777	0.784	0.791	0.821	0.828	0.835
	40–49	0.762	0.770	0.777	0.799	0.808	0.817
	50–59	0.747	0.756	0.765	0.778	0.787	0.796
	60–69	0.746	0.756	0.766	0.770	0.781	0.791

		Females			Males		
Measure	**Age Group**	**Lower 95% CI**	**Mean**	**Upper 95% CI**	**Lower 95% CI**	**Mean**	**Upper 95% CI**
	70–79	0.724	0.738	0.752	0.744	0.757	0.769
	80–89	0.680	0.698	0.715	0.706	0.725	0.745

Note: MCS, mental component summary from the SF-12; PCS, physical component summary from the SF-12; QWB, Quality of Well-being Scale. Sampling weights are taken into account.