

Health-Related Quality of Life as an Indicator of Quality of Care

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*HPM216: Quality Assessment/
Making the Business Case for Quality*

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Examples of Health-Related Quality of Life in Pubmed

- *Int J Public Health*, 2014, in 8,743 coronary patients
- *J Cancer Surviv*, 2014, SF-36 in cancer survivors
- *JAMA Otolaryngol Head Neck Surg*, 2013, laryngopharyngeal reflux-HRQOL laryngopharyngeal reflux patients
- *JAMA*, 2011, “sexual HRQOL” in men with prostate cancer

Health-Related Quality of Life (HRQOL)

How the person FEELS (well-being)

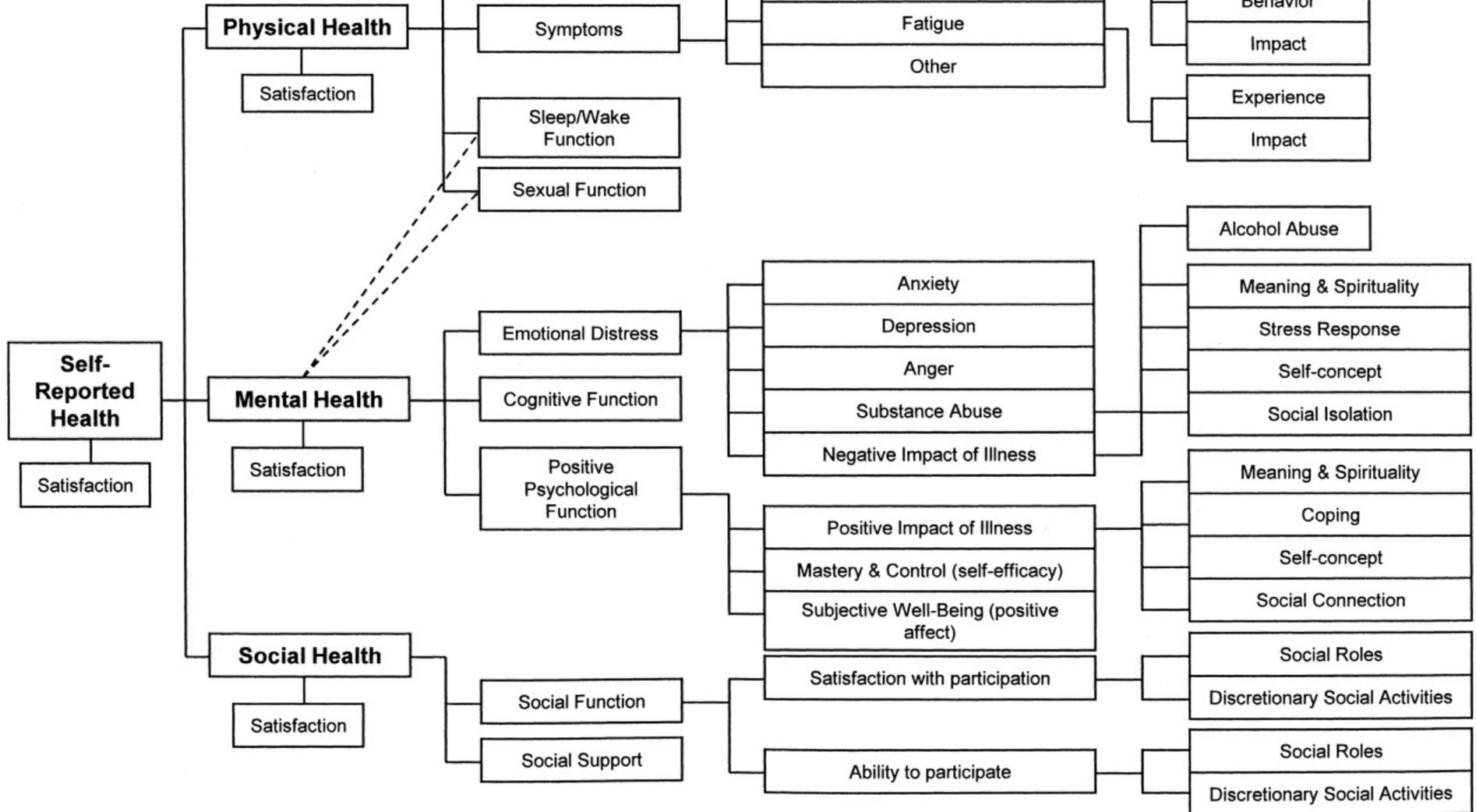
- Emotional well-being
- Pain
- Energy

What the person can DO (functioning)

- Self-care
- Role
- Social



| |
|---|
| PROMIS v1.0 bank |
| CaPS or U Pitt bank in development |
| PROMIS area tested but no bank developed for v1.0 |
| Area addressed (in part) by bank within lineage |
| Area not addressed yet |



In the past 7 days ...

I was grouchy [1st question]

- Never [39]
- Rarely [48]
- Sometimes [56]
- Often [64]
- Always [72]

Estimated Anger = 56.1

SE = 5.7 (rel. = 0.68)

In the past 7 days ...

I felt like I was ready to explode

[2nd question]

- Never
- Rarely
- Sometimes
- Often
- Always

Estimated Anger = 51.9

SE = 4.8 (rel. = 0.77)

In the past 7 days ...

I felt angry [3rd question]

- Never
- Rarely
- Sometimes
- Often
- Always

Estimated Anger = 50.5

SE = 3.9 (rel. = 0.85)

In the past 7 days ...

I felt angrier than I thought I should

[4th question]

- Never
- Rarely
- Sometimes
- Often
- Always

Estimated Anger = 48.8

SE = 3.6 (rel. = 0.87)

In the past 7 days ...

I felt annoyed [5th question]

- Never
- Rarely
- Sometimes
- Often
- Always

Estimated Anger = 50.1

SE = 3.2 (rel. = 0.90)

In the past 7 days ...

I made myself angry about something just by thinking about it. [6th question]

- Never
- Rarely
- Sometimes
- Often
- Always

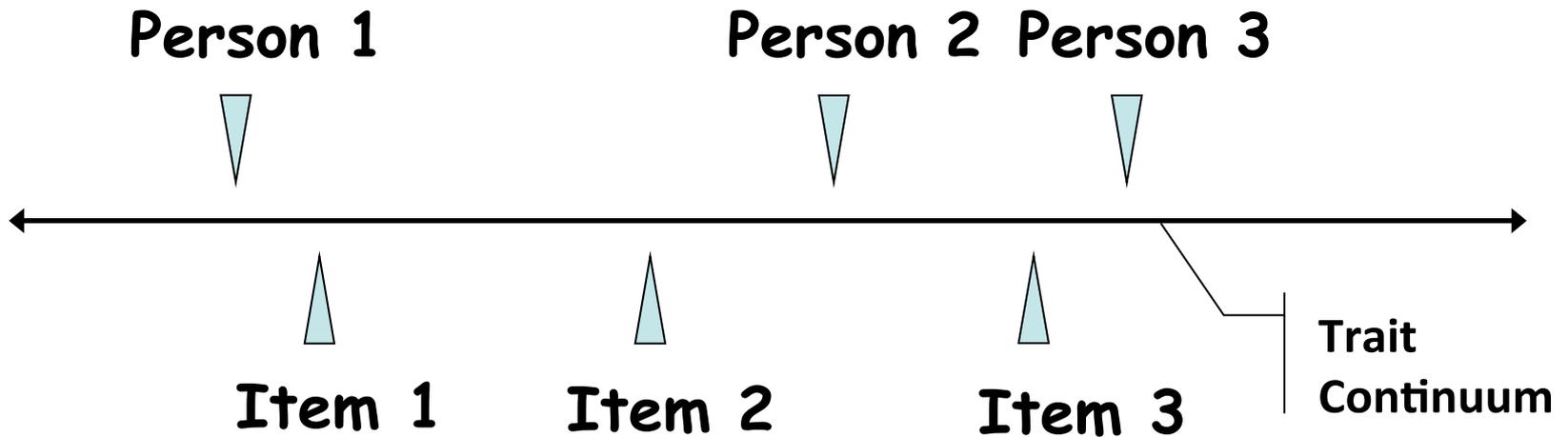
Estimated Anger = 50.2

SE = 2.8 (rel = 0.92)

Computer Adaptive Testing (CAT)



Item Responses and Trait Levels

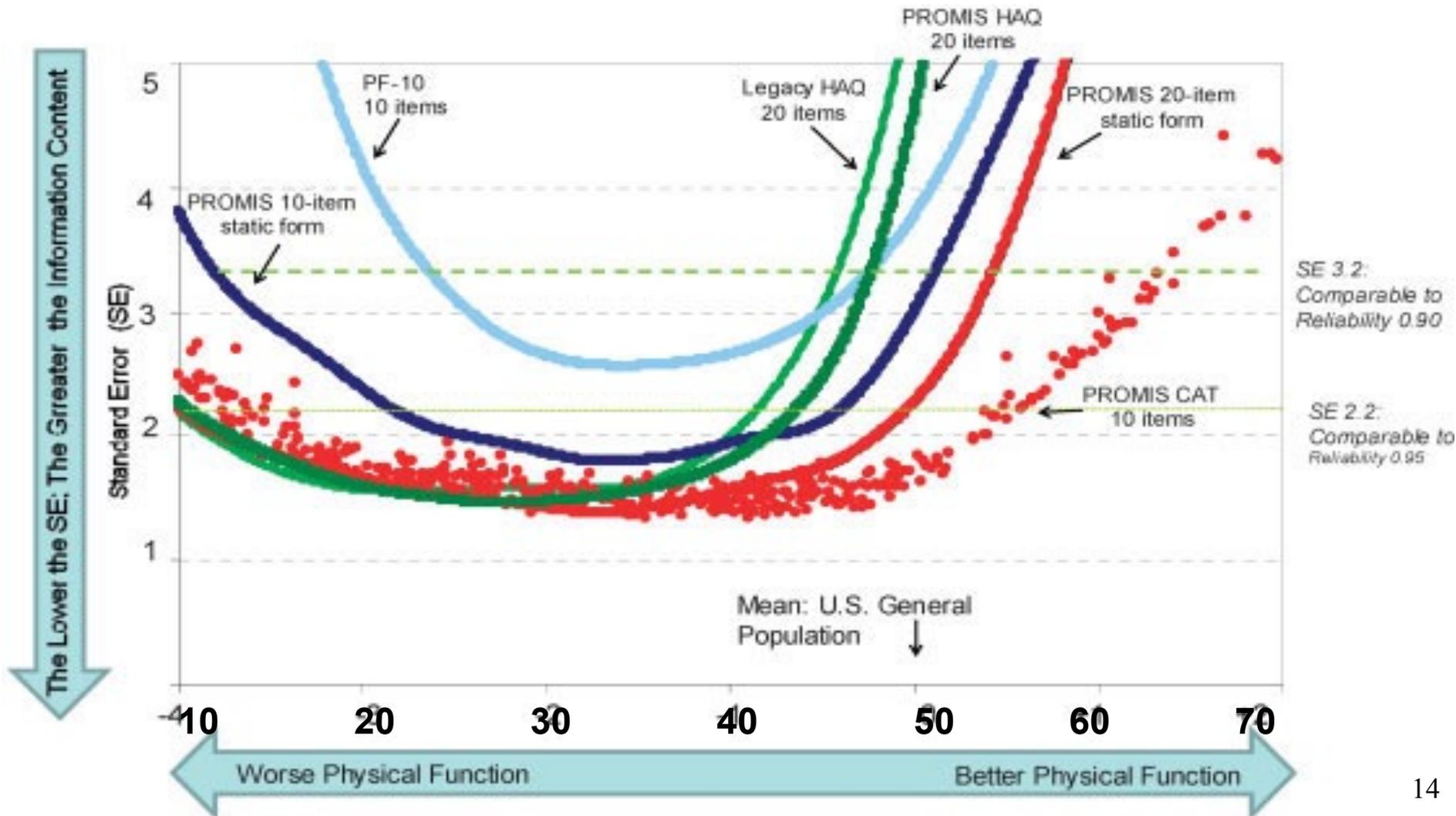


www.nihpromis.org

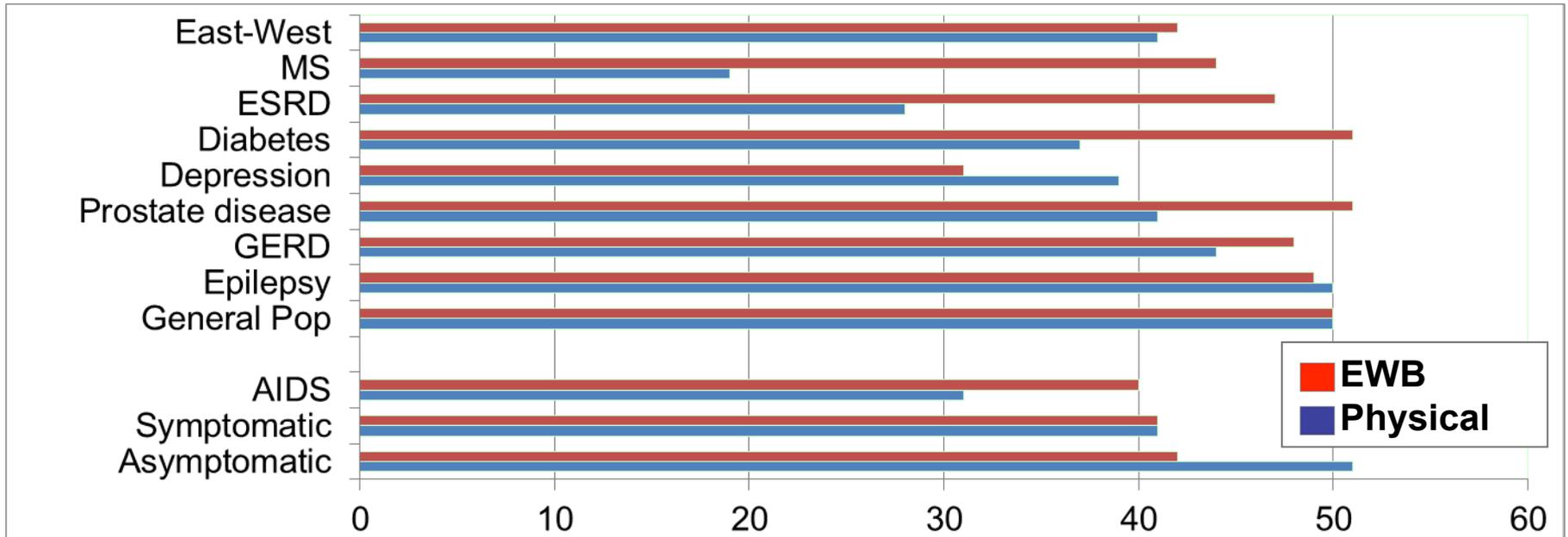
Reliability Target for Use of Measures with Individuals

- Reliability ranges from 0-1
 - 0.90 or above is goal
 - $SEM = SD (1 - \text{reliability})^{1/2}$
 - 95% CI = true score $\pm 1.96 \times SEM$
 - if true z-score = 0, then CI: -.62 to +.62
 - Width of CI is 1.24 z-score units
- Reliability = 0.90 when SE = 3.2
 - T-scores (mean = 50, SD = 10) $T = 50 + (z * 10)$
 - Reliability = $1 - (SE/10)^2$

PROMIS Physical Functioning vs. "Legacy" Measures



Physical Functioning and Emotional Well-Being at Baseline for 54 Patients at UCLA-Center for East West Medicine

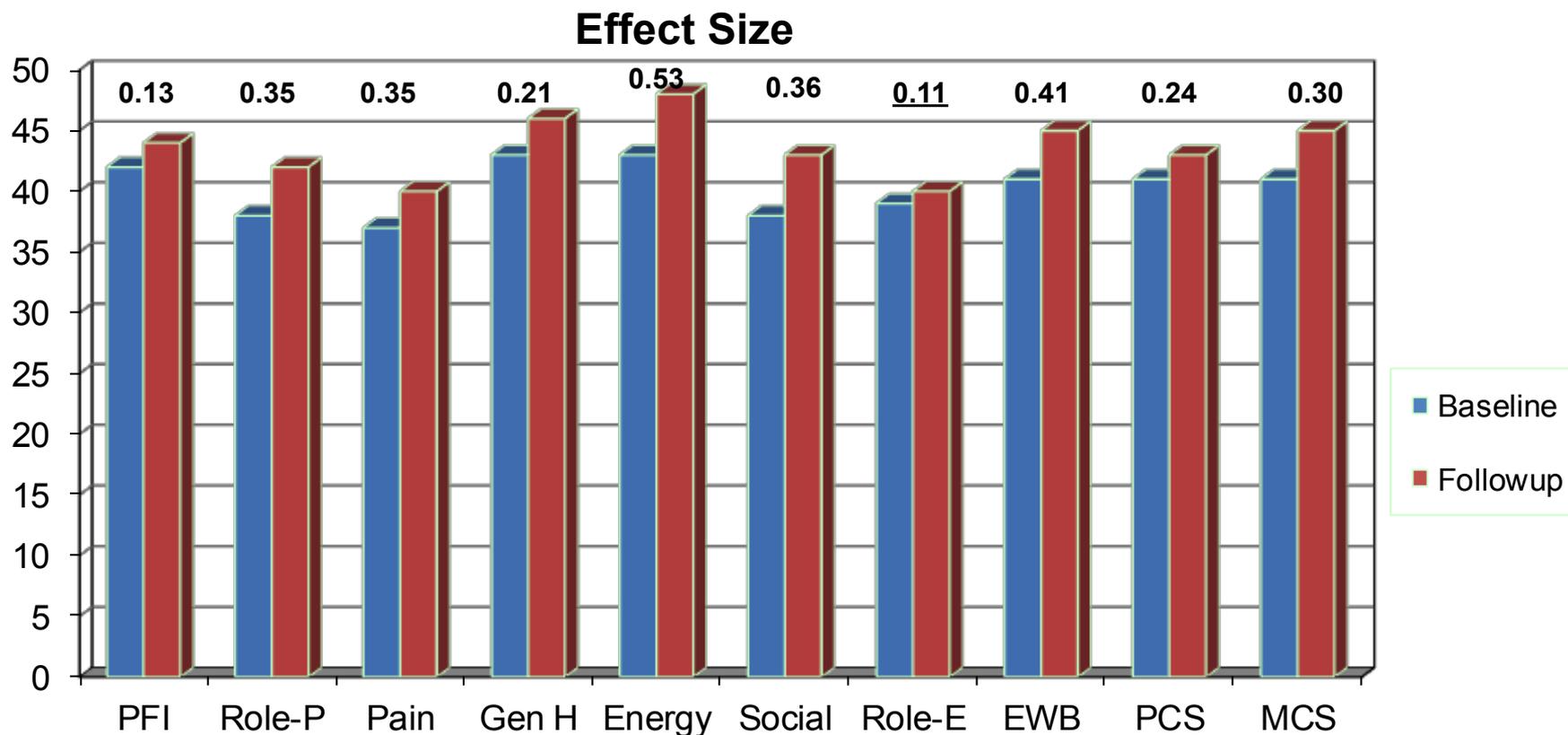


MS = multiple sclerosis; ESRD = end-stage renal disease; GERD = gastroesophageal reflux disease.

Significant Improvement in all but 1 of SF-36 Scales (Change is in T-score metric)

| | Change | t-test | prob. |
|--------------|---------------|---------------|----------------|
| PF-10 | 1.7 | 2.38 | .0208 |
| RP-4 | 4.1 | 3.81 | .0004 |
| BP-2 | 3.6 | 2.59 | .0125 |
| GH-5 | 2.4 | 2.86 | .0061 |
| EN-4 | 5.1 | 4.33 | .0001 |
| SF-2 | 4.7 | 3.51 | .0009 |
| RE-3 | 1.5 | 0.96 | .3400 ← |
| EWB-5 | 4.3 | 3.20 | .0023 |
| PCS | 2.8 | 3.23 | .0021 |
| MCS | 3.9 | 2.82 | .0067 |

Effect Sizes for Changes in SF-36 Scores



PFI = Physical Functioning; Role-P = Role-Physical; Pain = Bodily Pain; Gen H=General Health; Energy = Energy/Fatigue; Social = Social Functioning; Role-E = Role-Emotional; EWB = Emotional Well-being; PCS = Physical Component Summary; MCS =Mental Component Summary.

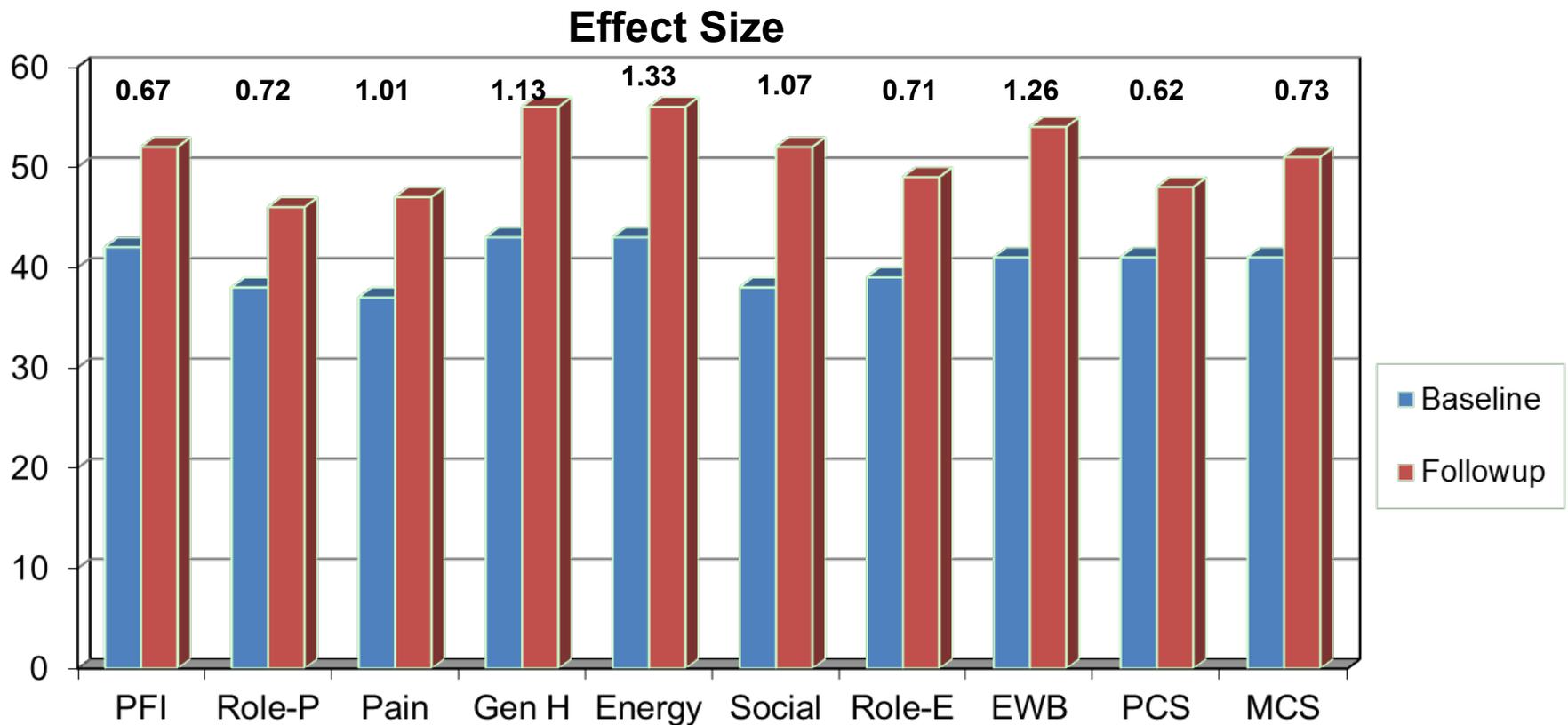
Effect Size

$(\text{Follow-up} - \text{Baseline}) / \text{SD}_{\text{baseline}}$

Cohen's Rule of Thumb:

- ✓ ES = 0.20 Small
- ✓ ES = 0.50 Medium
- ✓ ES = 0.80 Large

Amount of Change Needed for Significant Individual Change



PFI = Physical Functioning; Role-P = Role-Physical; Pain = Bodily Pain; Gen H=General Health; Energy = Energy/Fatigue; Social = Social Functioning; Role-E = Role-Emotional; EWB = Emotional Well-being; PCS = Physical Component Summary; MCS =Mental Component Summary.

7-31% of People in Sample Improve Significantly

| | % Improving | % Declining | Difference |
|--------------|--------------------|--------------------|-------------------|
| PF-10 | 13% | 2% | + 11% |
| RP-4 | 31% | 2% | + 29% |
| BP-2 | 22% | 7% | + 15% |
| GH-5 | 7% | 0% | + 7% |
| EN-4 | 9% | 2% | + 7% |
| SF-2 | 17% | 4% | + 13% |
| RE-3 | 15% | 15% | 0% |
| EWB-5 | 19% | 4% | + 15% |
| PCS | 24% | 7% | + 17% |
| MCS | 22% | 11% | + 11% |

Defining a Responder: Reliable Change Index (RCI)

$$\frac{X_2 - X_1}{(\sqrt{2}) (SEM)}$$

$$SEM = SD_{bl} \times \sqrt{1 - r_{xx}}$$

Note: SD_{bl} = standard deviation at baseline
 r_{xx} = reliability

Amount of Change in Observed Score Needed To be Statistically Significant

$$(\sqrt{2}) (SD_{bl}) \sqrt{(1 - r_{xx})} (1.96)$$


Note: SD_{bl} = standard deviation at baseline and r_{xx} = reliability

“Implementing patient-reported outcomes assessment in clinical practice: a review of the options and considerations”

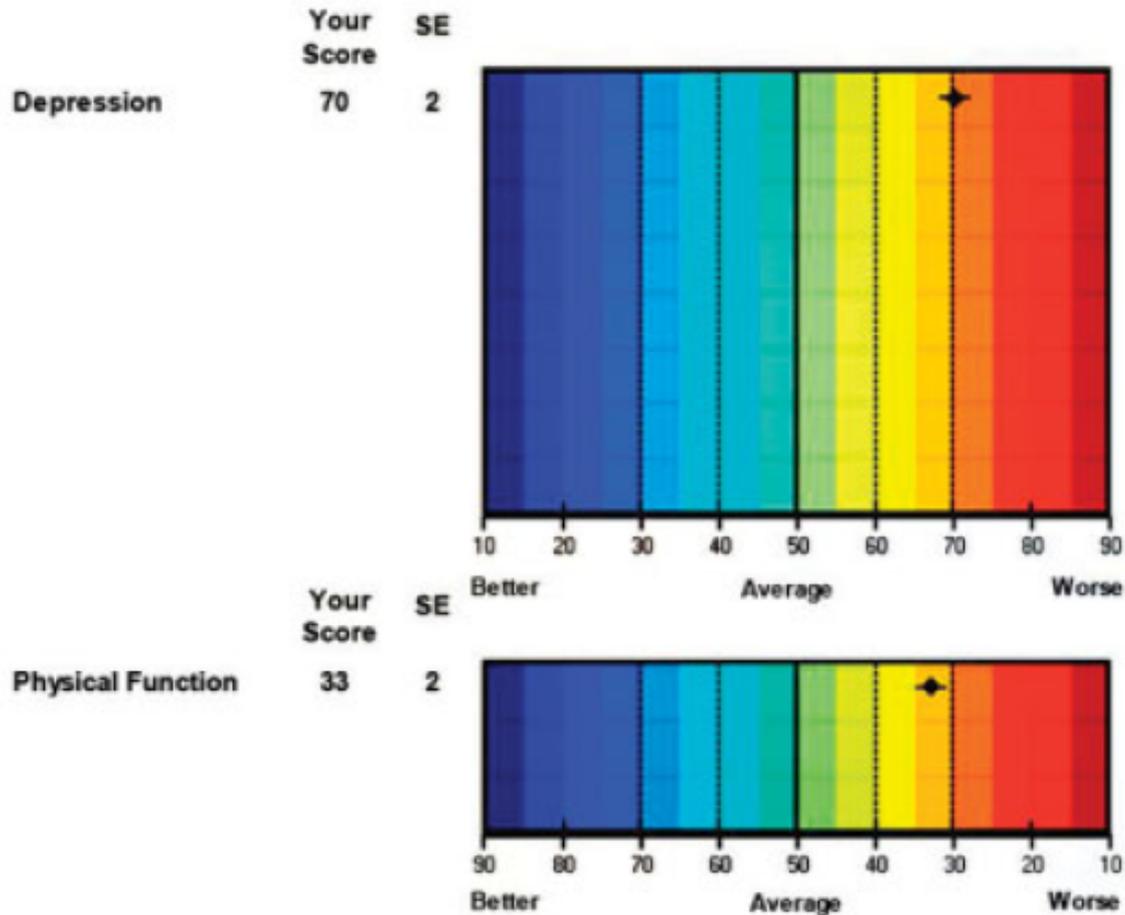
➤ Snyder, C.F., Aaronson, N. K., et al. Quality of Life Research, 21, 1305-1314, 2012.

- HRQOL has rarely been collected in a standardized fashion in routine clinical practice.
- Increased interest in using PROs for individual patient management.
- Research shows that use of PROs:
 - Improves patient-clinician communication
 - May improve outcomes

Your scores for the CATs you completed are shown below.

The diamond ♦ is placed where we think your score lies. This diamond is placed on your T-Score, which is a standardized score that is based on an average score of 50, based on responses to the same questions in the United States general population. The T-score also has a standard deviation of 10 points, so a score of 40 or 60 represents a score that is one standard deviation away from the average score of the general US population.

The Standard Error (SE) is a statistical measure of variance and represents the possible range of your score. The lines on either side of the diamond in your profile report show the possible range of your actual score around this estimated score. It is very likely that your score is in the range of these lines.



Break



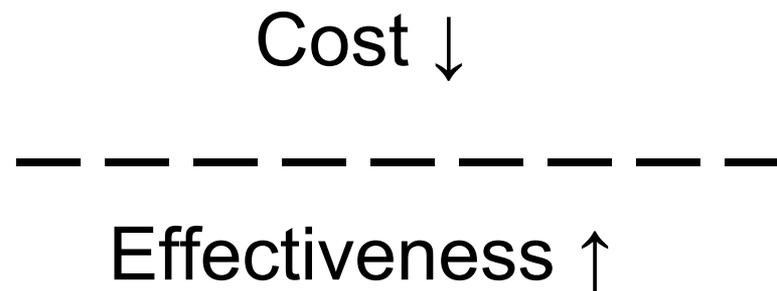
U.S. Health Care Issues



- **Access to care**
 - ~ 50 million people without health insurance
- **Costs of care**
 - Expenditures ~ \$ 2.7 Trillion
- **Effectiveness (quality) of care**

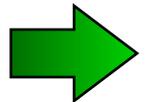
How Do We Know If Care Is Effective?

- Effective care maximizes probability of desired health outcomes
 - Health outcome measures indicate whether care is effective



Health Outcomes Measures

- Traditional clinical endpoints
 - Survival
 - Clinical/biological indicators
 - Rheumatoid factor
 - Blood pressure
 - Hematocrit



- Patient-Reported Outcomes

Types of HRQOL Measures



- **Generic vs. Targeted**
- **Profile vs. Preference-based**

Generic Item

In general, how would you rate your health?

Excellent

Very Good

Good

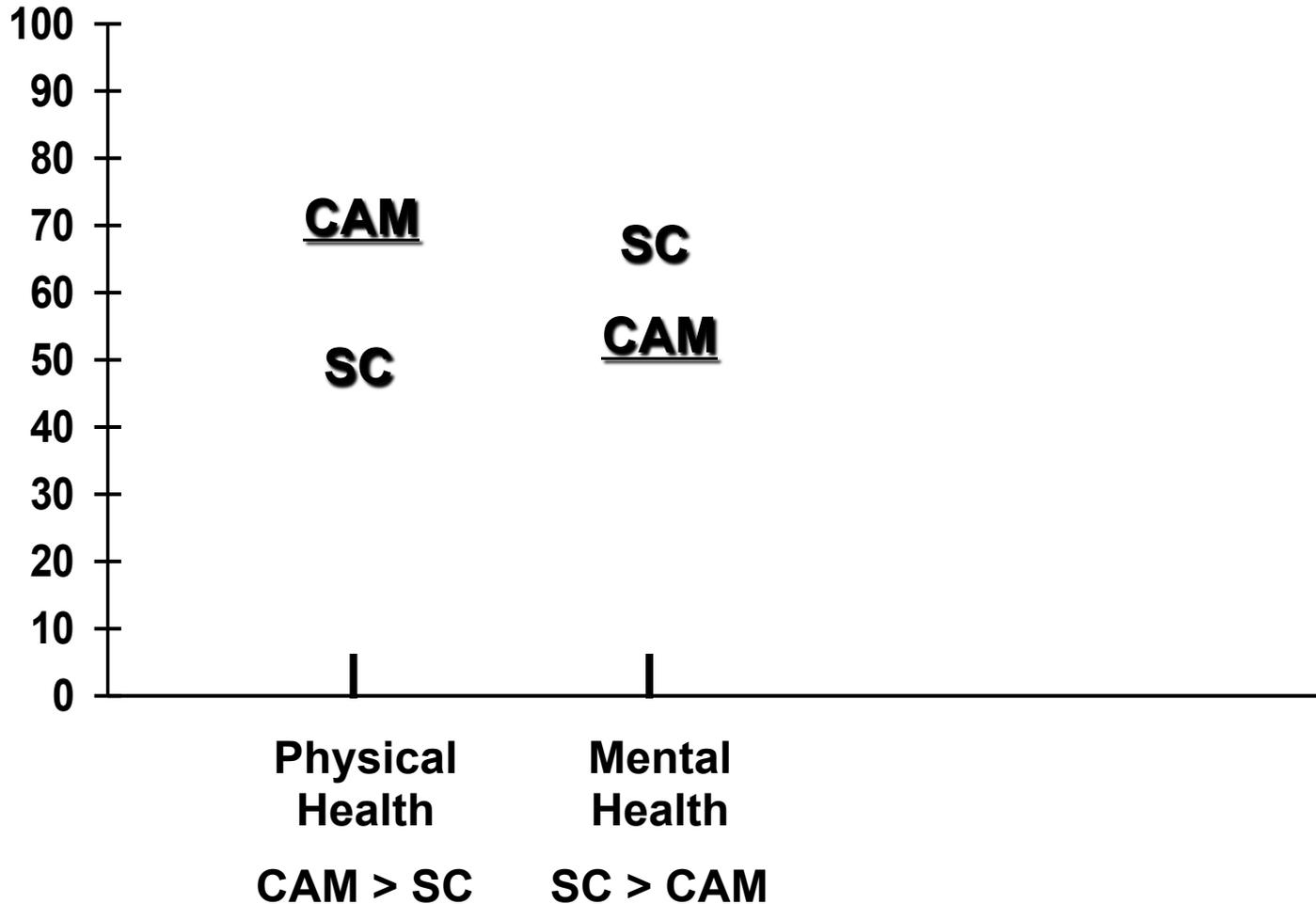
Fair

Poor

Targeted Items Assessing “Burden of Kidney Disease”

- ❖ My kidney disease interferes too much with my life.
- ❖ Too much of my time is spent dealing with my kidney disease.
- ❖ I feel frustrated with my kidney disease.
- ❖ I feel like a burden on my family.

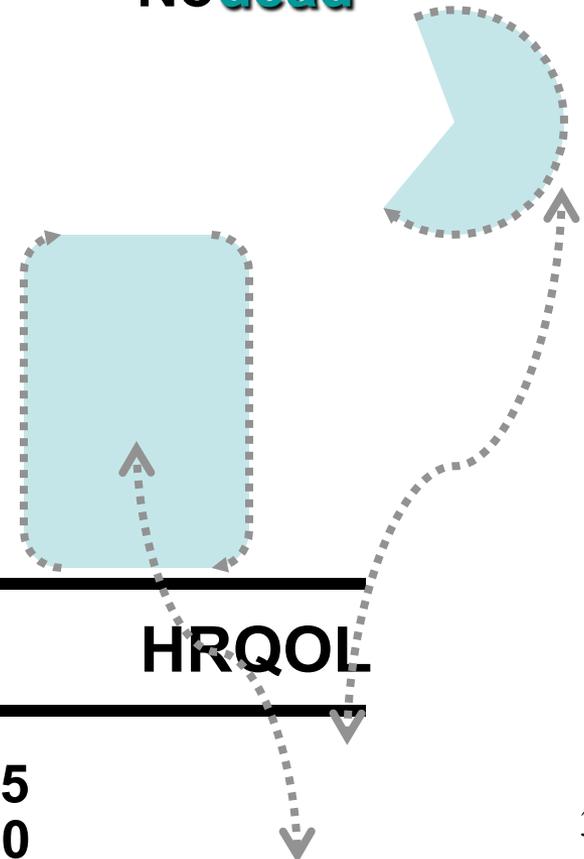
Is CAM Better than Standard Care (SC)?



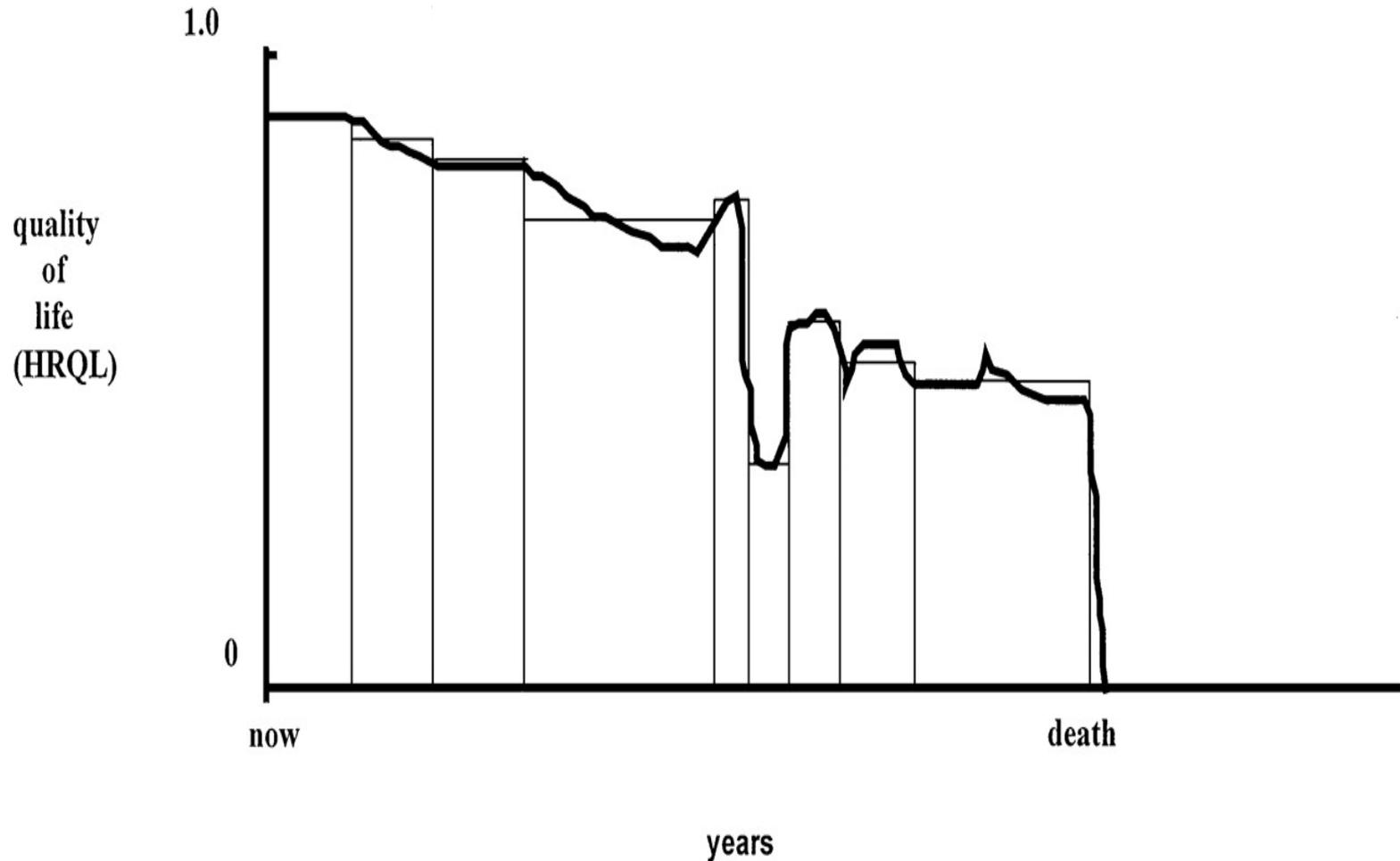
Is Acupuncture Related to Worse HRQOL?

| Subject | Acupuncture (0-100) | HRQOL |
|---------|------------------------|-------|
| 1 | No | dead |
| 2 | No | dead |
| 3 | No 50 | |
| 4 | No 75 | |
| 5 | No 100 | |
| 6 | Yes 0 | |
| 7 | Yes 25 | |
| 8 | Yes 50 | |
| 9 | Yes 75 | |
| 10 | Yes 100 | |

| Group | n | HRQOL |
|-----------------|-----|-------|
| No Acupuncture | 375 | |
| Yes Acupuncture | 550 | |



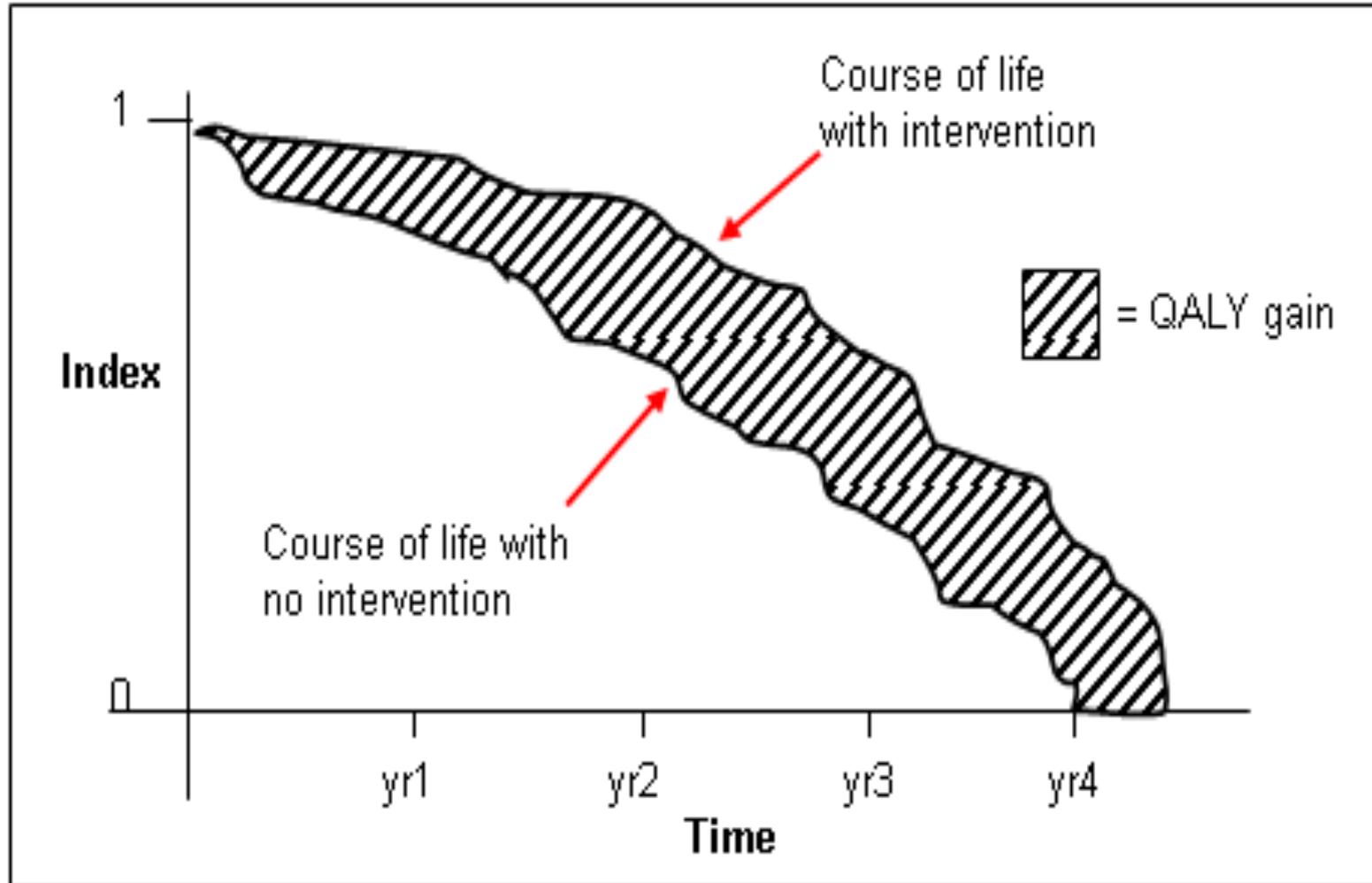
Quality of Life for Individual Over Time



Goal is Access to Cost-Effective Care

Cost ↓

Effectiveness (“Utility”) ↑



"QALYs: The Basics"

Milton Weinstein, George Torrance, Alistair McGuire
(Value in Health, 2009, vol. 12 Supplement 1)

- What is value?
 - Preference or desirability of health states
- How are QALYs used?
 - Societal resource allocation
 - Personal decisions such as decision about whether to have a treatment
 - Societal or program audit
 - Evaluate programs in terms of health of the population.

Utility Assessments

An important issue in medical decision making is how to measure people's preferences for health states in a way that will facilitate comparisons of health states. The most important measure of preference is the "utility" of the health state to the individual who will experience it, which is a value from 0 (representing death) to 1 (perfect health and well-being).

This page allows you to assess the utility for a health state using three techniques: rating scale, standard gamble, and time tradeoff.

Enter the health state that you'd like to assess the utility of:

Select the assessment method to use:

- Rating scale
- Standard Gamble
- Time Tradeoff

<http://araw.mede.uic.edu/cgi-bin/utility.cgi>

$SG \succ TTO \succ RS$

➤ $SG = TTO^a$

➤ $SG = RS^b$

Where a and b are less than 1

The EQ-5D-3L descriptive system should be scored as follows:

0.435

By placing a tick in one box in each group, please indicate which statements best describe your health today.

Mobility

- I have no problems in walking about
- I have some problems in walking about
- I am confined to bed

Self-Care

- I have no problems with self-care
- I have some problems washing or dressing myself
- I am unable to wash or dress myself

Usual Activities (*e.g. work, study, housework, family or leisure activities*)

- I have no problems with performing my usual activities
- I have some problems with performing my usual activities
- I am unable to perform my usual activities

Pain/Discomfort

- I have no pain or discomfort
- I have moderate pain or discomfort
- I have extreme pain or discomfort

Anxiety/Depression

- I am not anxious or depressed
- I am moderately anxious or depressed
- I am extremely anxious or depressed

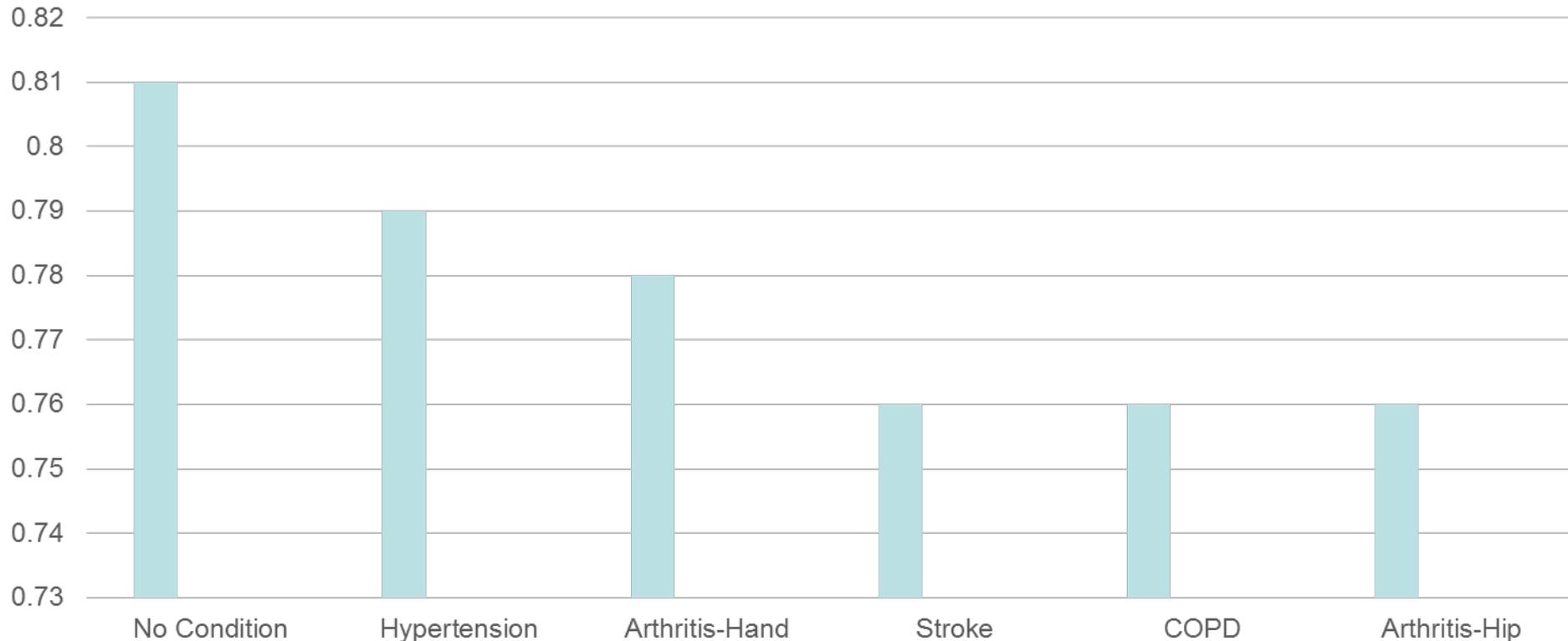
Levels of perceived problems are coded as follows:

- Level 1 is coded as a '1'
-
-
- Level 2 is coded as a '2'
-
-
- Level 3 is coded as a '3'
-

NB: There should be only one response for each dimension.

HRQOL in SEER-Medicare Health Outcomes Study (n = 126,366)

SF-6D (0-1 possible range) by Condition



Controlling for age, gender, race/ethnicity, education, income, and marital status.

Distant stage of cancer associated with 0.05-0.10 lower SF-6D Score

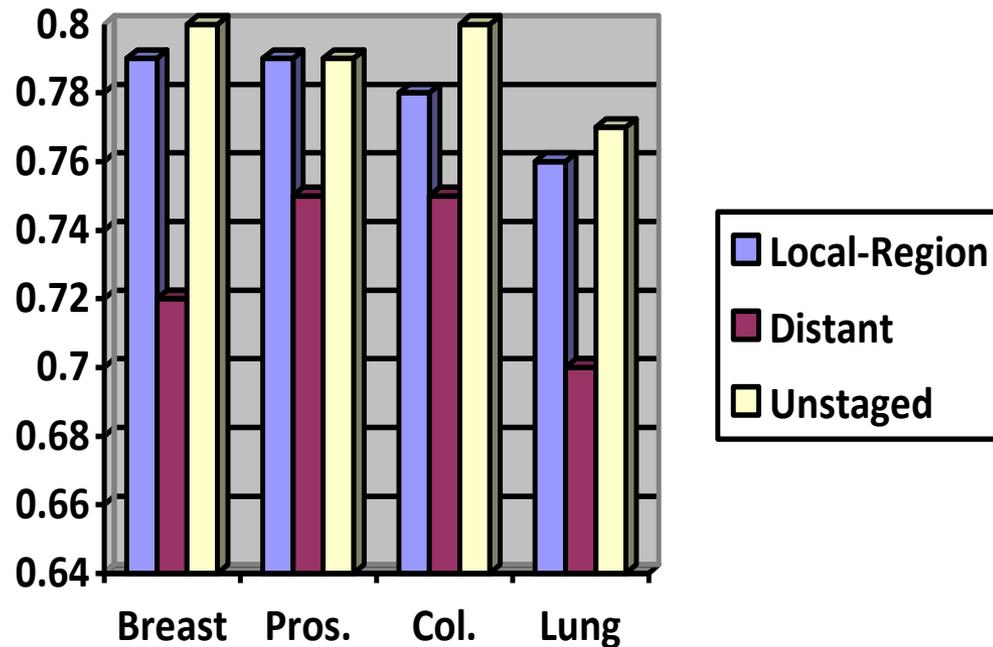


Figure 1. Distant Stage of Disease Associated with Worse SF-6D Scores (Sample sizes for local/regional, distant, and unstaged: Breast (2045,26, 347); Prostate (2652, 61 and 633), Colorectal (1481, 48 and 203), and Lung (466, 47 and 65).

Questions?

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Powerpoint file at:

<http://gim.med.ucla.edu/FacultyPages/Hays/>