



# Health-Related Quality of Life (HRQOL) Assessment in Outcome Studies

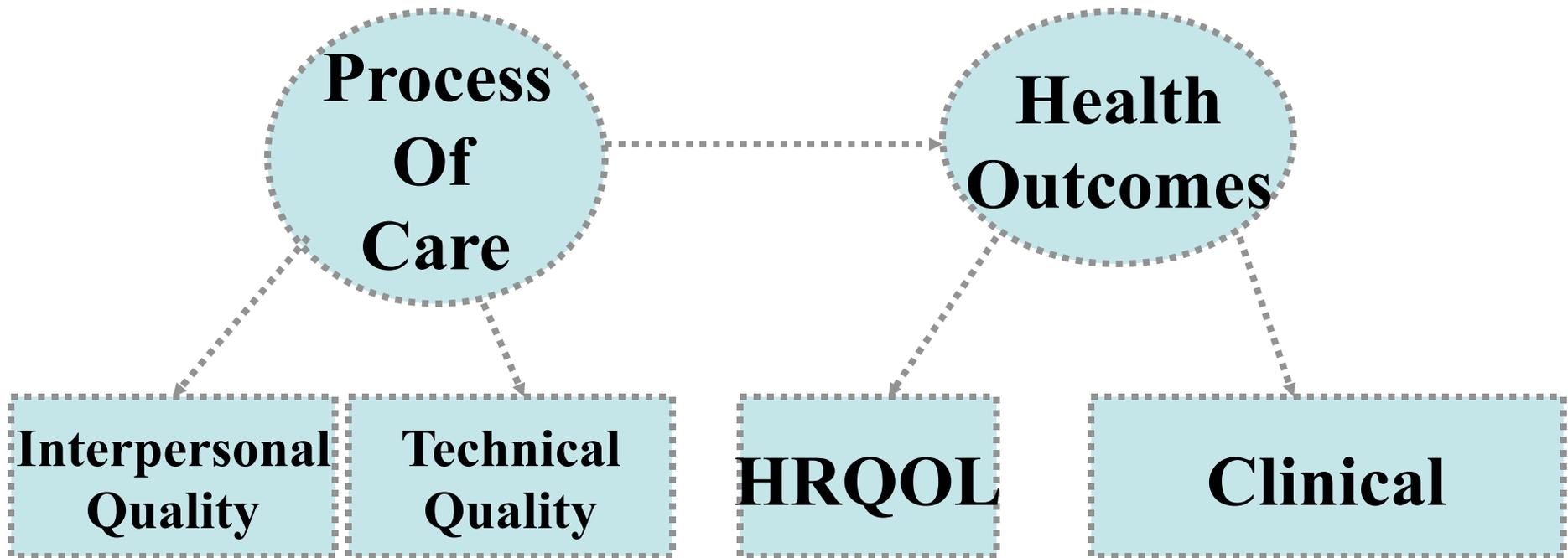
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UCLA/RAND

GCRC Summer Course  
“The Essentials of Clinical Investigation:  
Developing a Research Proposal”

Gonda Building 1357 (July 14, 2008, 8-9 am)

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

# HRQOL is a Patient-Reported Outcome (PRO)

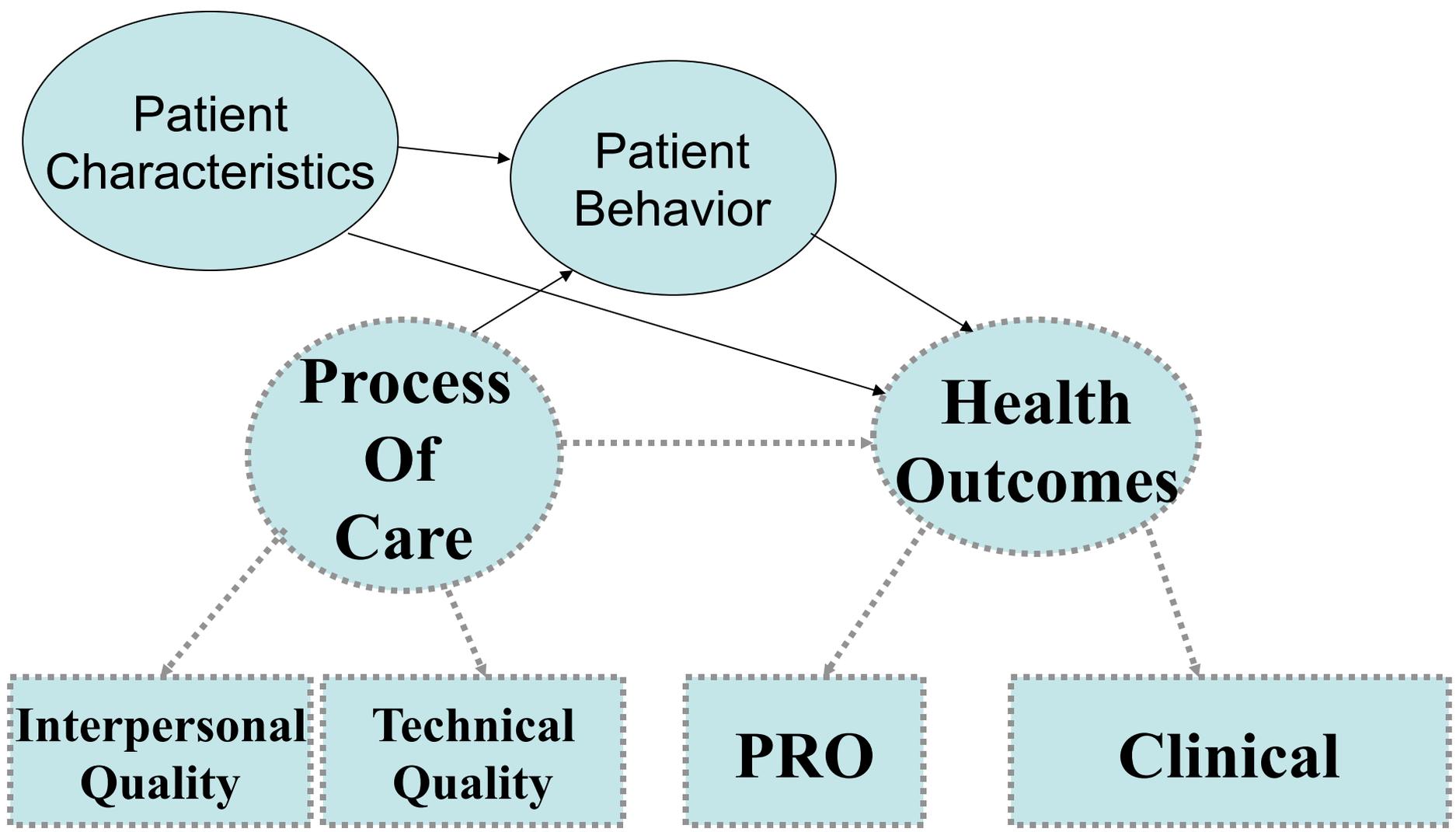


# Process of Care

- Expert Consensus
  - Quality of Care “If Then” Indicators
    - % of patients with diabetes with one or more HbA1c tests annually
- Patient reports about communication
  - In the last 12 months, how often did your doctor explain things in a way that was easy to understand?

# Health Outcomes

- Clinical
  - % of patients with diabetes with most recent HbA1c level >9.0% ( poor control)
- Patient global rating of health
  - Would you say that in general your health is:
    - Excellent
    - Very good
    - Good
    - Fair
    - Poor



# Health Services Research 2008 Eisenberg Award

Adobe Acrobat Professional - [Kahn et al HSR 2007.pdf]

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DOI: 10.1111/j.1475-6773.2006.00604.x

## Does Ambulatory Process of Care Predict Health-Related Quality of Life Outcomes for Patients with Chronic Disease?

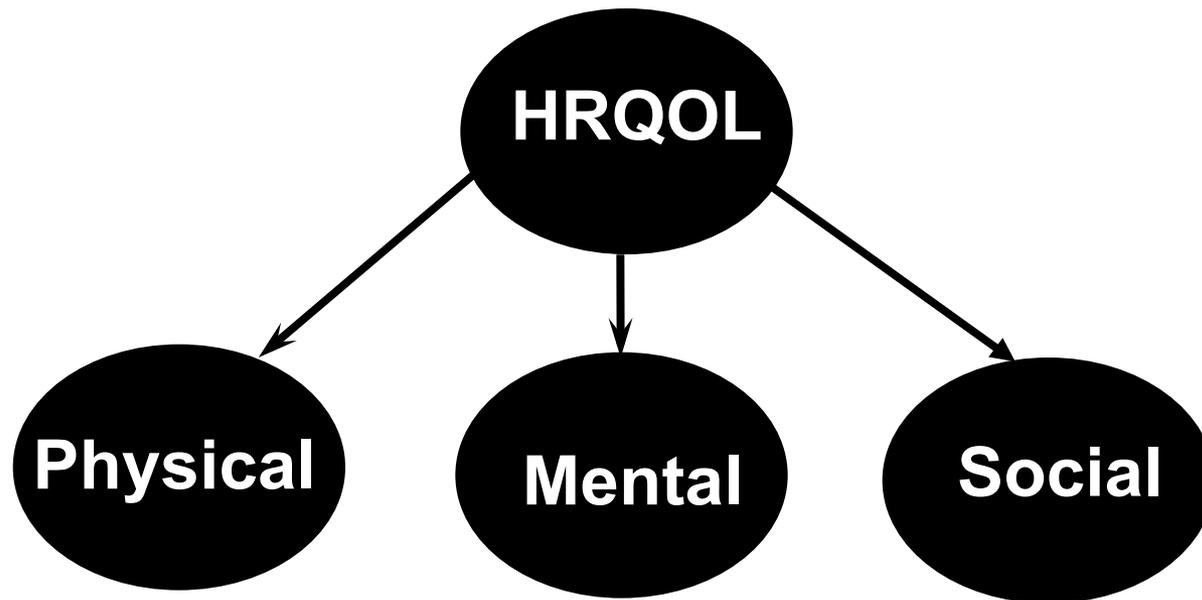
*Katherine L. Kahn, Diana M. Tisnado, John L. Adams, Honghu Liu, Wen-Pin Chen, Fang Ashlee Hu, Carol M. Mangione, Ronald D. Hays, and Cheryl L. Damberg*

**Objective.** The validity of quality of care measurement has important implications for practicing clinicians, their patients, and all involved with health care delivery. We used empirical data from managed care patients enrolled in west coast physician organizations to test the hypothesis that observed changes in health-related quality of life across a

# Health-Related Quality of Life is:

- How the person FEELS (well-being)
  - Emotional well-being
  - Pain
  - Energy
- What the person can DO (functioning)
  - Self-care
  - Role
  - Social

# HRQOL is Multi-Dimensional



# HRQOL is Not

- Quality of environment
- Type of housing
- Level of income
- Social Support



In general, how would you  
rate your health?

Poor

Fair

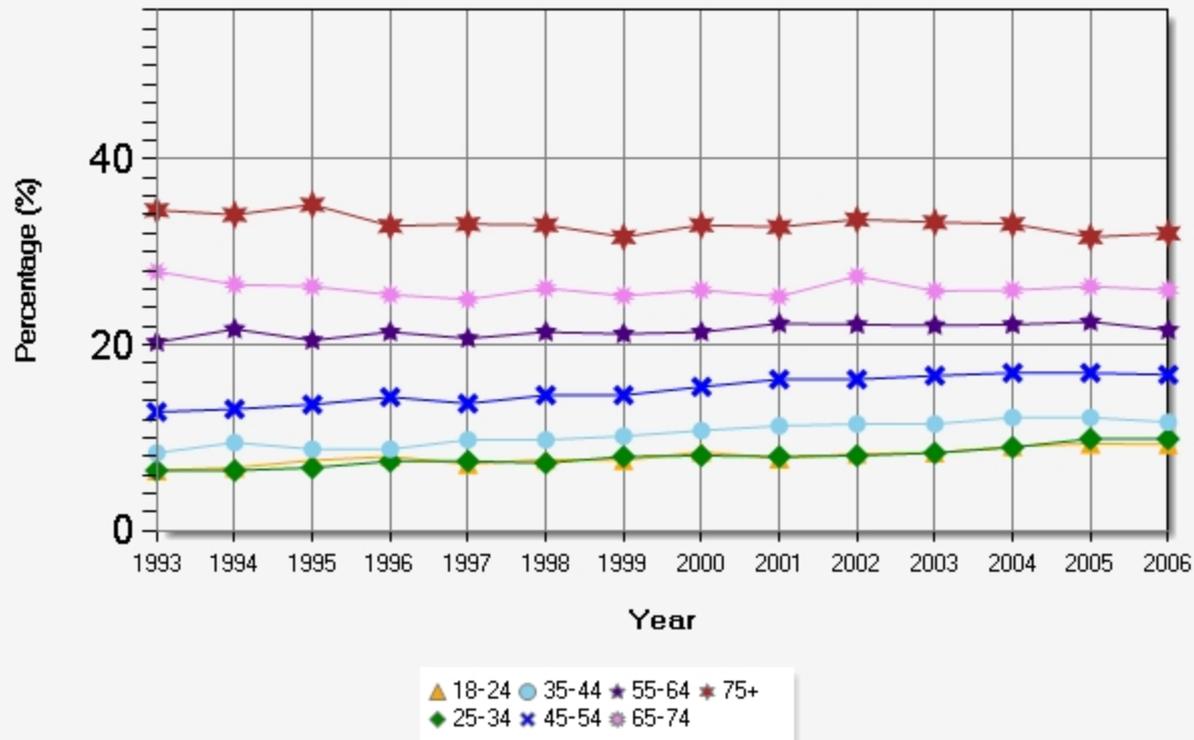
Good

Very Good

Excellent

## Percentage with fair or poor self-rated health

Nationwide trend: Age Group



**Greater % of fair or poor health reported  
by older adults (33% for 75+ versus 9% for 18-34)**

# SF-36 Generic Profile Measure

- Functioning
  - Physical functioning (10 items)
  - Role limitations/physical (4 items)
  - Role limitations/emotional (3 items)
  - Social functioning (2 items)
- Well-being
  - Emotional well-being (5 items)
  - Energy/fatigue (4 items)
  - Pain (2 items)
  - General health perceptions (5 items)

How much of the time during the past 4 weeks have you been happy?

*None of the time*

*A little of the time*

*Some of the time*

*Most of the time*

*All of the time*



Does your health now limit you  
in walking more than a mile?

(If so, how much?)

*No, not limited at all*

*Yes, limited a little*

*Yes, limited a lot*

# 0-100 Scoring of HRQOL Scales

Average or sum all items in the same scale.

0 (worst) to 100 (best) possible range (linear)  
transformation

$$X_{0-100} = \frac{(\text{original score} - \text{minimum}) * 100}{(\text{maximum} - \text{minimum})}$$

**The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?**

1. Vigorous activities, such as running, lifting heaving objects, participating in strenuous sports
2. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
3. Lifting or carrying groceries
4. Climbing several flights of stairs
5. Climbing one flight of stairs
6. Bending, kneeling, or stooping
7. Walking more than a mile
8. Walking several blocks
9. Walking one block
10. Bathing or dressing yourself

1. Yes, limited a lot -----> 0
2. Yes, limited a little ----> 50
3. No, not limited at all -->100

# Change in Physical Function

*My score today = 100*

## Intervention #1:

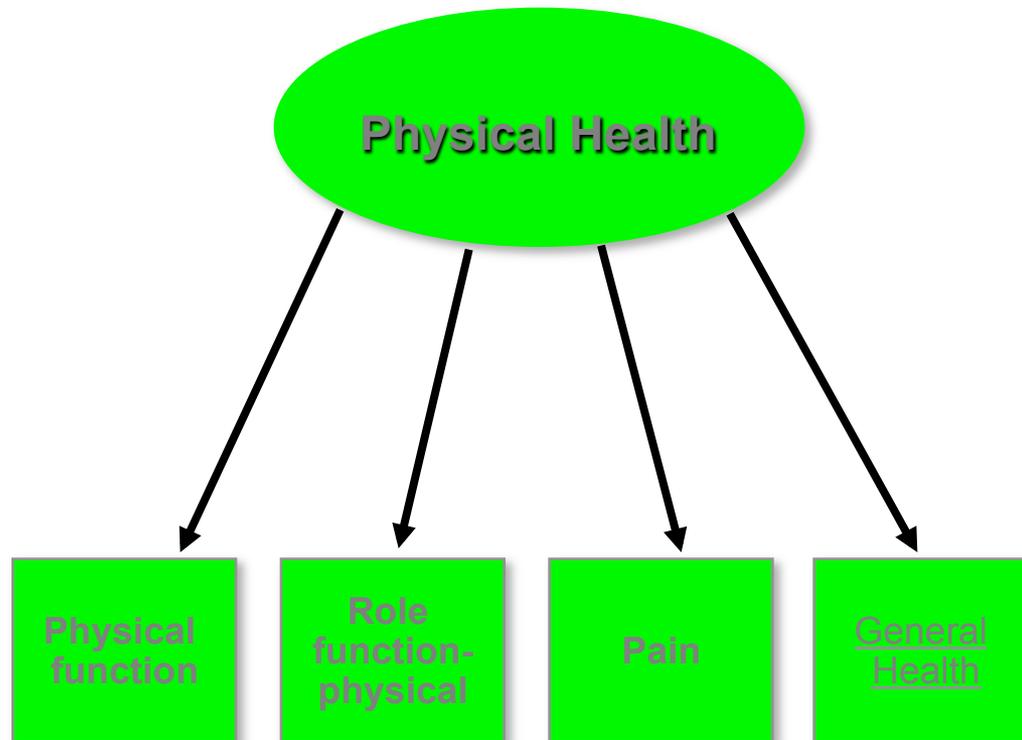
- Hit by **Rock** results in being *limited a little* in vigorous activities
- Post-intervention score: 95 ( - 0.25 SD)

## Intervention #2:

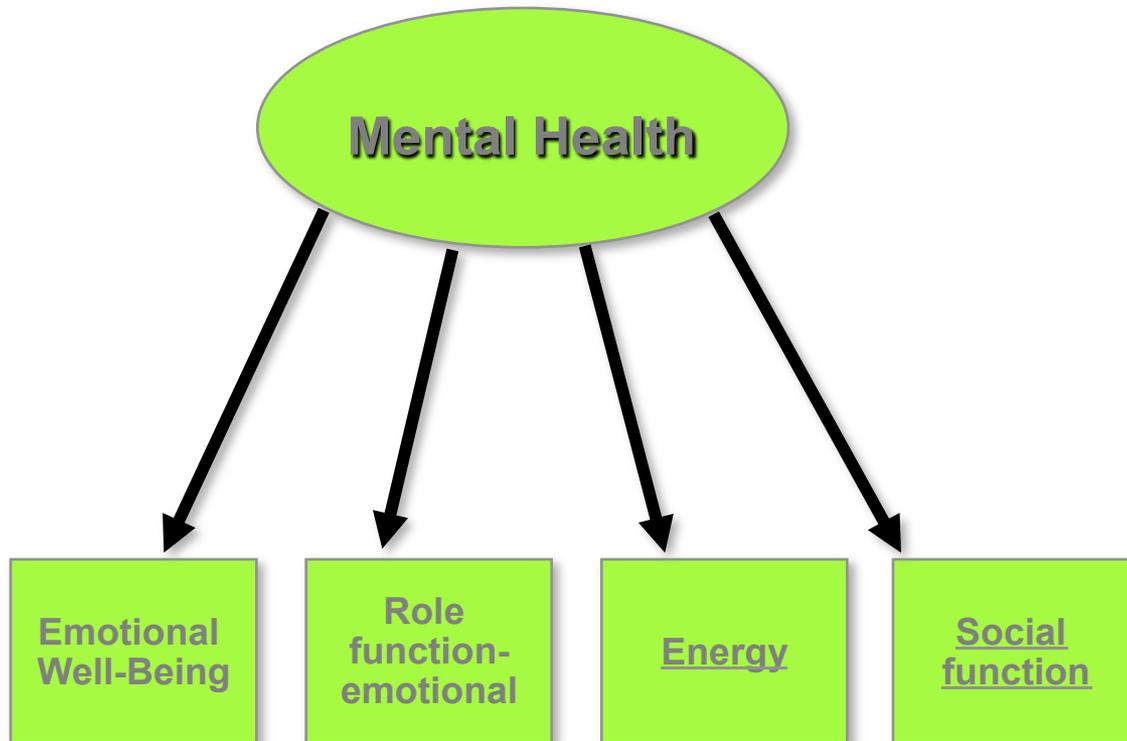
- Hit by **Bike** results in me being:
  - *limited a lot* in vigorous activities and in climbing several flights of stairs
  - *limited a little* in moderate activities
- Post-intervention score: 75 ( - 1.25 SD)

Mean = 87 (SD = 20)  
75th percentile = 100 (U.S. males)

# SF-36 Physical Health



# SF-36 Mental Health



# SF-36 Physical Health (PCS) & Mental Health (MCS) Summary Scores

$$\begin{aligned} \text{PCS}_z = & (\text{PF}_z * .42402) + (\text{RP}_z * .35119) + \\ & (\text{BP}_z * .31754) + (\text{GH}_z * .24954) + \\ & (\text{EF}_z * .02877) + (\text{SF}_z * -.00753) + \\ & (\text{RE}_z * -.19206) + (\text{EW}_z * -.22069) \end{aligned}$$

$$\begin{aligned} \text{MCS}_z = & (\text{PF}_z * -.22999) + (\text{RP}_z * -.12329) + \\ & (\text{BP}_z * -.09731) + (\text{GH}_z * -.01571) + \\ & (\text{EF}_z * .23534) + (\text{SF}_z * .26876) + \\ & (\text{RE}_z * .43407) + (\text{EW}_z * .48581) \end{aligned}$$

$$\begin{aligned} \text{PCS} &= (\text{PCS}_z * 10) + 50 \\ \text{MCS} &= (\text{MCS}_z * 10) + 50 \end{aligned}$$

# T-Scores

Fix mean and SD in sample or with respect to a reference population:

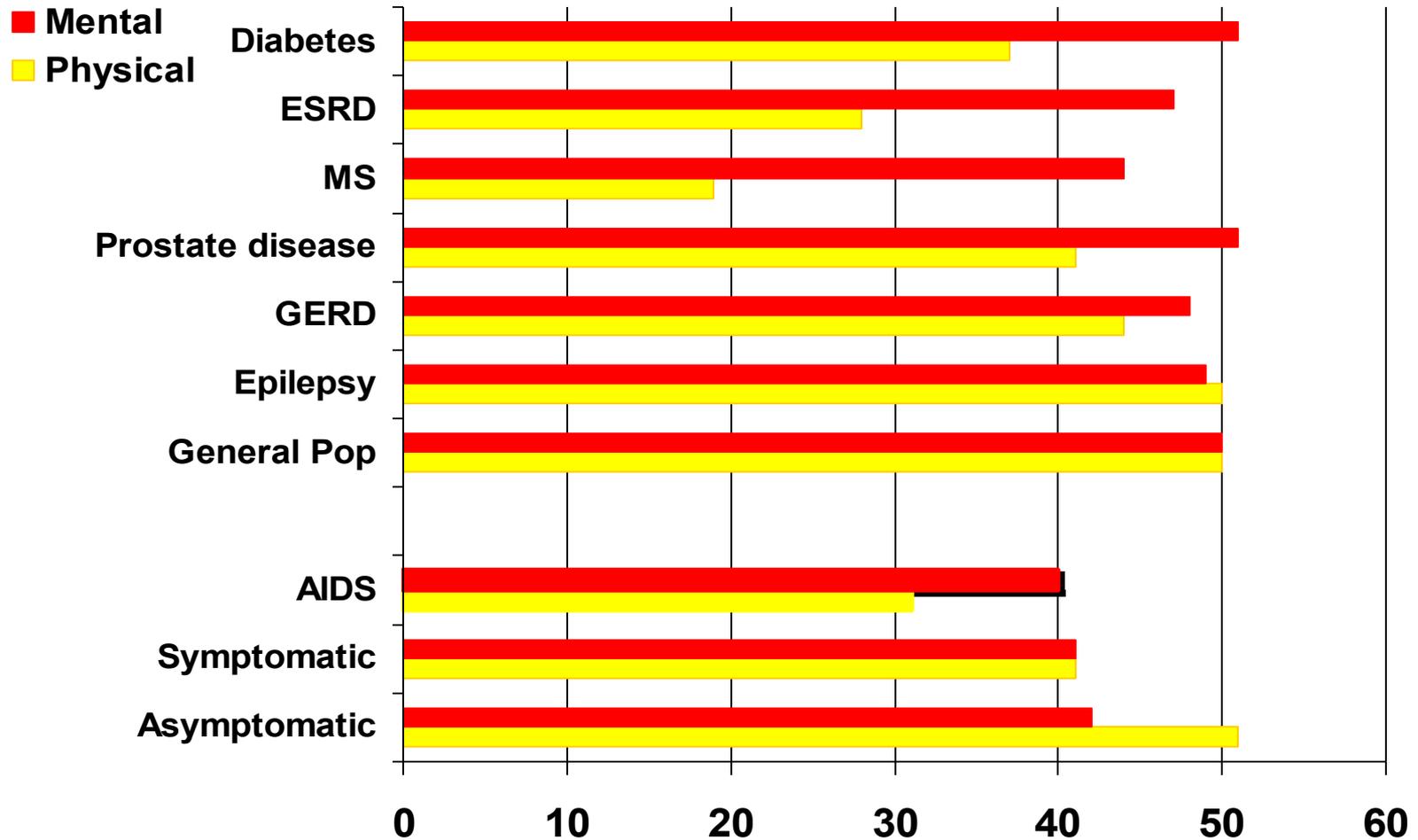
z-score (mean = 0, SD = 1)

T-score (mean = 50, SD = 10)

$$\text{Zscore} = \frac{(\text{X} - \text{sample or population mean})}{\text{SD}_x}$$

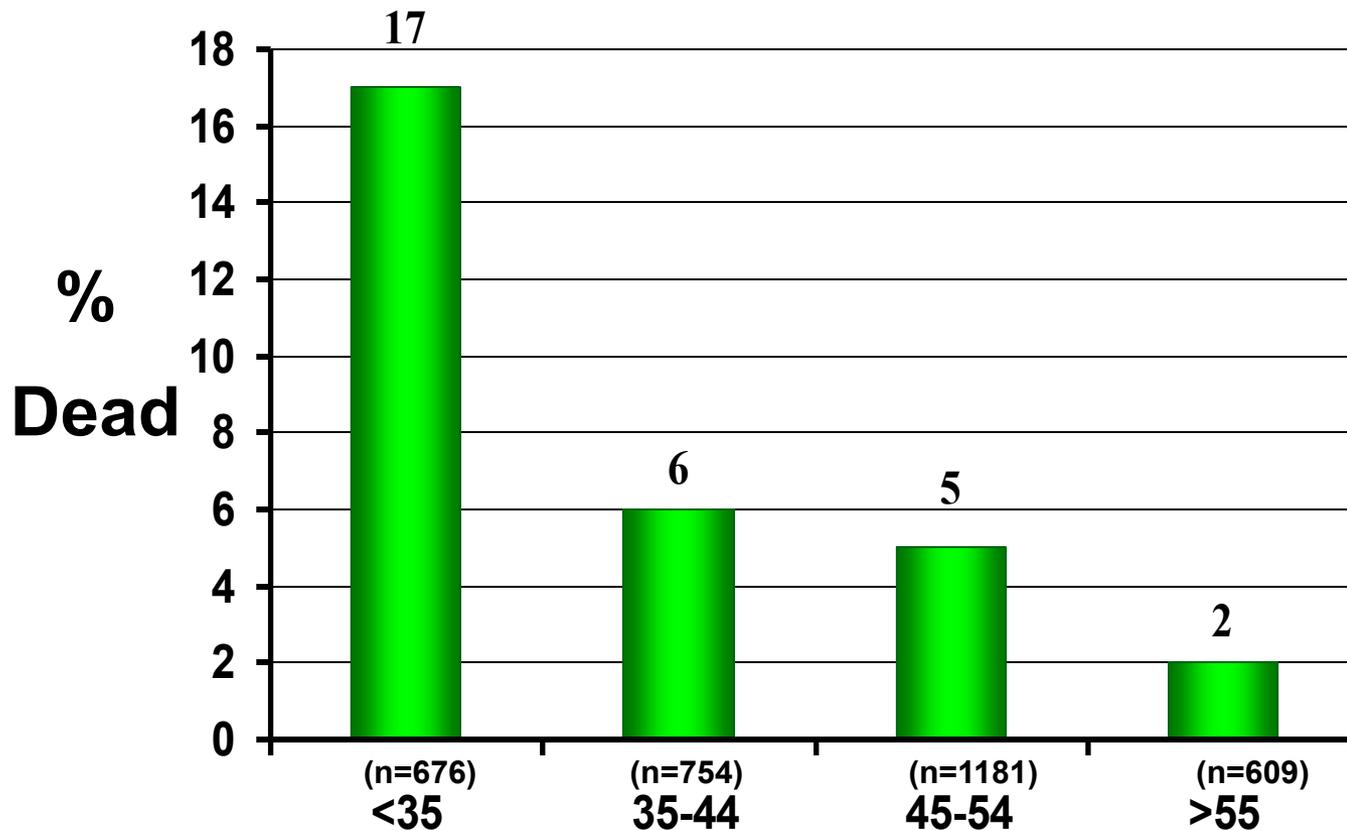
$$\text{Y} = \text{target mean} + (\text{target SD} * \text{Zx})$$

# Burden of Diabetes Compared to other Conditions and General Population



*Hays et al. (2000), American Journal of Medicine*

# PCS Predictive of 5-Year Mortality



SF-36 Physical Health Component Score (PCS)—T score

Ware et al. (1994). SF-36 Physical and Mental Health Summary Scales: A User's Manual.

# Kidney-Disease Targeted Items

- During the last 30 days, to what extent were you bothered by each of the following.
  - Cramps during dialysis ?
  - Feeling washed out or drained?

***Not at all bothered***

***Somewhat bothered***

***Moderately bothered***

***Very much bothered***

***Extremely bothered***

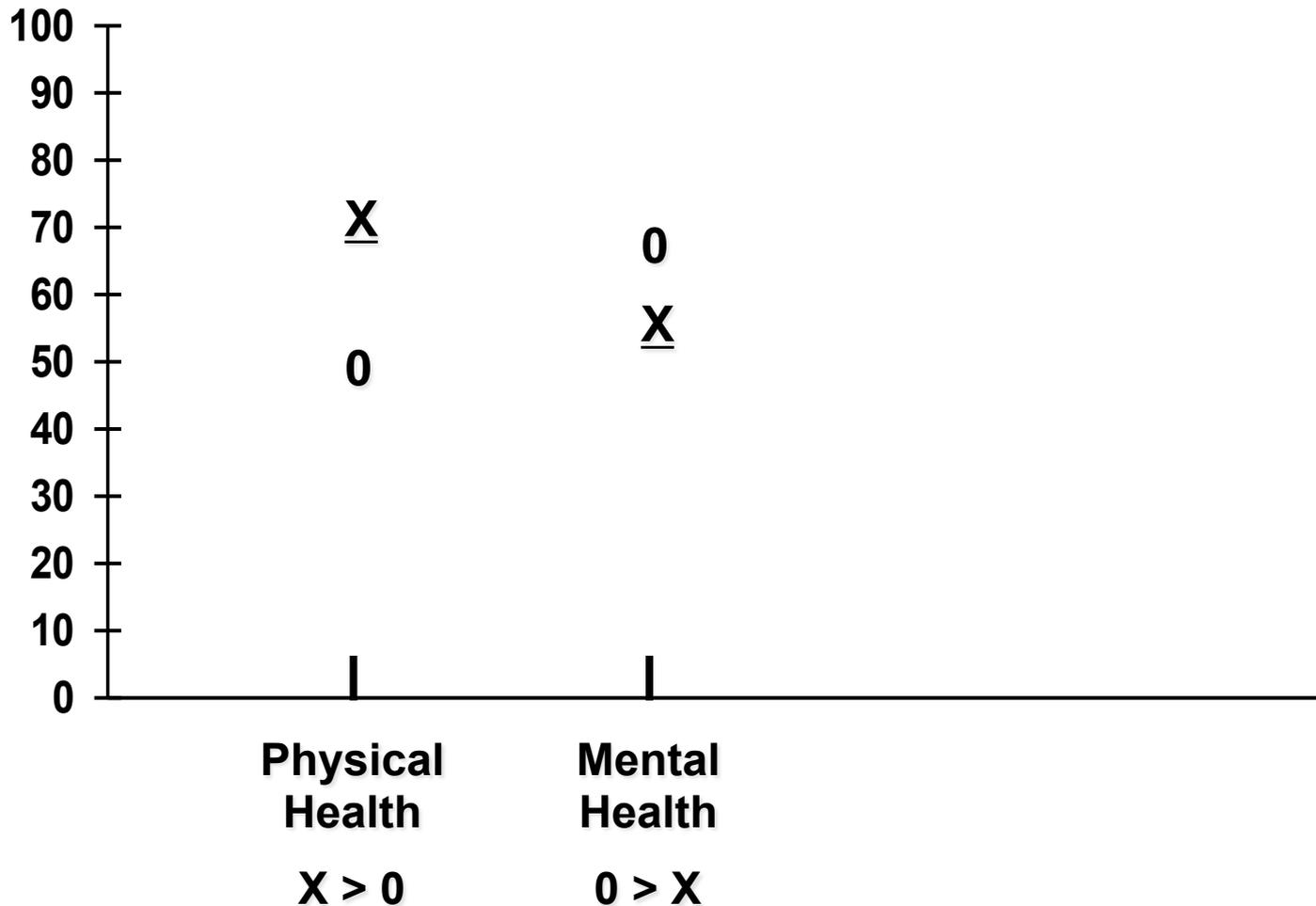
# Preference-Based Measures

Cost



Effectiveness

# Is New Treatment (X) Better Than Standard Care (O)?



# Medicine Use Diminishes HRQOL?

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Person	Medication Use	HRQOL (0-100 scale)
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

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Group	n	HRQOL
No Medicine	3	75
Yes Medicine	5	50

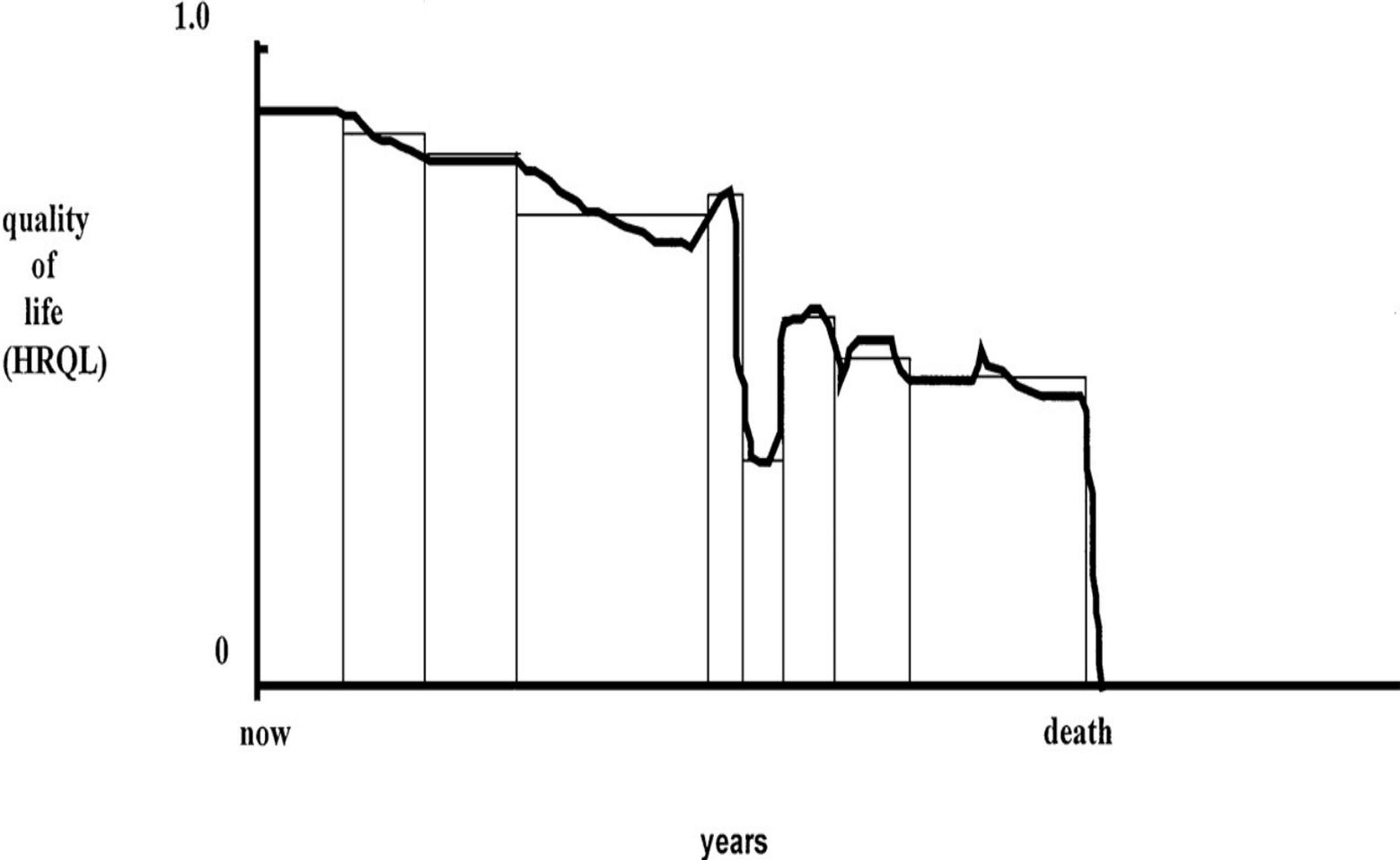
# Survival Analysis

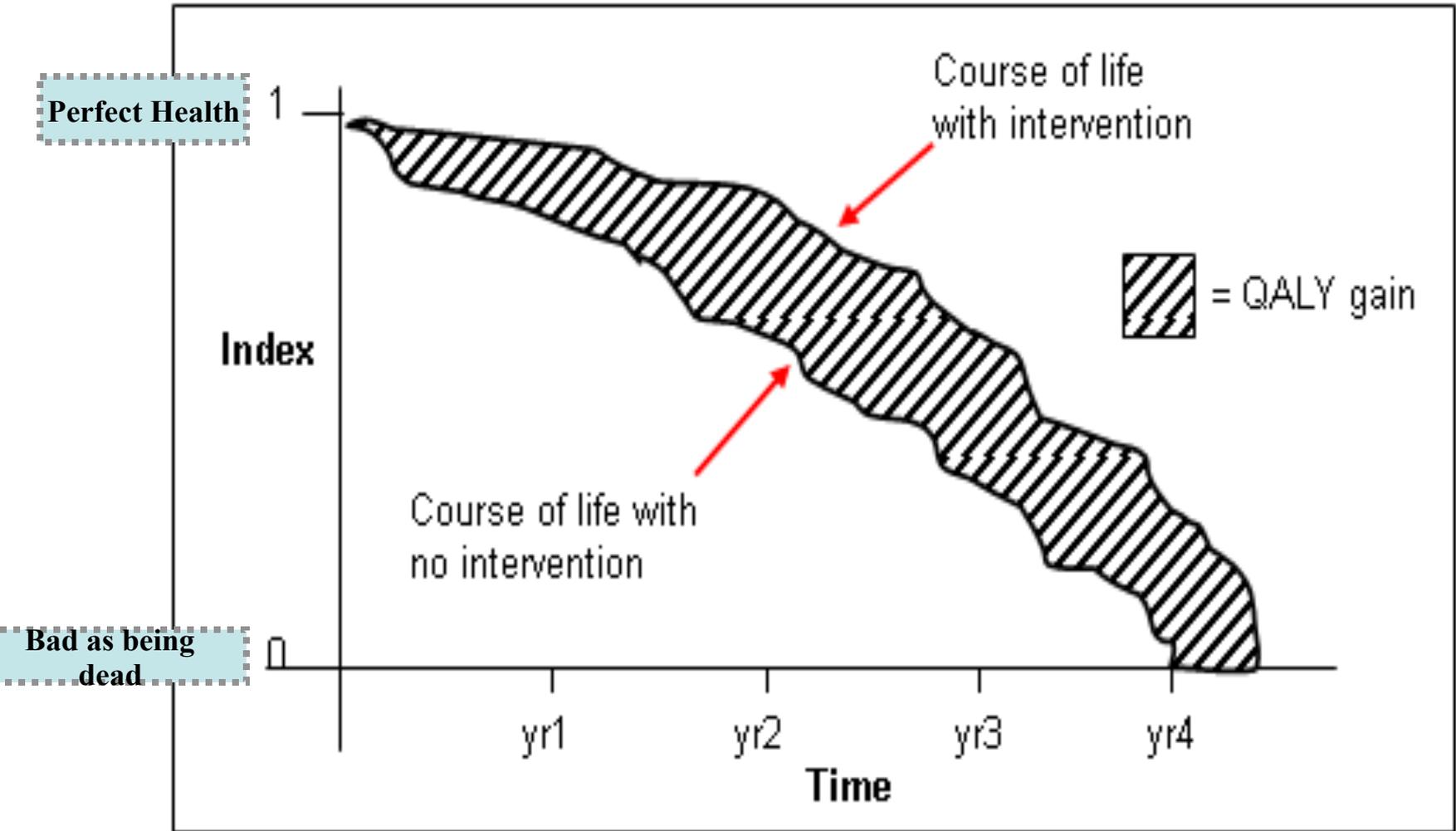
**Dead = 0.0**

**Runner and person in coma = 1.0**



# Quality of Life for Individual Over Time





# HRQOL Satisfy Reliability Minimum Standards

0.70 or above (for group comparisons)

Hahn, E. A., Cella, D., Chassany, O., Fairclough, D. L., Wong, G. Y., & Hays, R. D. (2007). Precision of health-related quality of life data compared with other clinical measures. Mayo Clinic Proceedings, 82 (10), 1244-1254.

# Thank you

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