Measuring and Valuing Health: Applications of the EQ-5D

Fatima Al Sayah
Feb 11, 2016
Outline

- How can we measure health?
- PROMs
- EQ-5D

Applications of EQ-5D in:
- Evaluating effectiveness of services
- Assessing population health
- Informing clinical practice
- Healthcare resource allocation decisions
How can we measure health?

- Measuring health is about understanding how a condition or a healthcare intervention affects a person’s health by finding out if they have any symptoms or if their day-to-day functioning has been affected.
Types of measures

- Objective vs. subjective measures
- Generic vs. specific measures
- Clinician (or proxy) vs. patient reported measures
- Health related quality of life vs. overall well-being measures
Types of measures

- Objective vs. subjective measures
- Condition specific vs. generic measures
- Clinician (or proxy) vs. patient reported measures
- Health related quality of life vs. overall well-being measures
What is a PROM?

- A Patient Reported Outcome Measure (PROM) is a questionnaire that asks patients to self report about their own health.

- Patient Reported Outcome Measures (PROMs) that focus on health-related quality of life (HRQoL).

*EuroQol 5 Dimensions Questionnaire (EQ-5D)*
The EQ-5D

The EQ-5D is a generic preference-based patient-reported outcome measure of health related quality of life.

It can be used to generate utility values for use in economic evaluation.

It is the most commonly used preference based measure around the world.

EQ-5D™ is a trademark of the EuroQol Research Foundation.

### Descriptive System

<table>
<thead>
<tr>
<th>MOBILITY</th>
<th>Visual Analogue Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no problems in walking about</td>
<td>100</td>
</tr>
<tr>
<td>I have slight problems in walking about</td>
<td>95</td>
</tr>
<tr>
<td>I have moderate problems in walking about</td>
<td>90</td>
</tr>
<tr>
<td>I have severe problems in walking about</td>
<td>85</td>
</tr>
<tr>
<td>I am unable to walk about</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SELF-CARE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no problems washing or dressing myself</td>
<td>75</td>
</tr>
<tr>
<td>I have slight problems washing or dressing myself</td>
<td>70</td>
</tr>
<tr>
<td>I have moderate problems washing or dressing myself</td>
<td>65</td>
</tr>
<tr>
<td>I have severe problems washing or dressing myself</td>
<td>60</td>
</tr>
<tr>
<td>I am unable to wash or dress myself</td>
<td>55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USUAL ACTIVITIES (e.g. work, study, housework, family, leisure)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no problems doing my usual activities</td>
<td>50</td>
</tr>
<tr>
<td>I have slight problems doing my usual activities</td>
<td>45</td>
</tr>
<tr>
<td>I have moderate problems doing my usual activities</td>
<td>40</td>
</tr>
<tr>
<td>I have severe problems doing my usual activities</td>
<td>35</td>
</tr>
<tr>
<td>I am unable to do my usual activities</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAIN/DISCOMFORT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no pain or discomfort</td>
<td>25</td>
</tr>
<tr>
<td>I have slight pain or discomfort</td>
<td>20</td>
</tr>
<tr>
<td>I have moderate pain or discomfort</td>
<td>15</td>
</tr>
<tr>
<td>I have severe pain or discomfort</td>
<td>10</td>
</tr>
<tr>
<td>I have extreme pain or discomfort</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANXIETY/DEPRESSION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I am not anxious or depressed</td>
<td>0</td>
</tr>
<tr>
<td>I am slightly anxious or depressed</td>
<td>5</td>
</tr>
<tr>
<td>I am moderately anxious or depressed</td>
<td>10</td>
</tr>
<tr>
<td>I am severely anxious or depressed</td>
<td>15</td>
</tr>
<tr>
<td>I am extremely anxious or depressed</td>
<td>20</td>
</tr>
</tbody>
</table>

The best health you can imagine

The worst health you can imagine
EQ-5D instruments

- **EQ-5D-3L**
  - Descriptive system: 5 dimensions; 3 levels
  - Visual analogue scale (VAS)

- **EQ-5D-5L**
  - Descriptive system: 5 dimensions; 5 levels
  - Visual analogue scale (VAS)

- **EQ-5D-Y**
  - Descriptive system: 5 dimensions; 3 levels
  - Visual analogue scale (VAS)

**Formats:**
- Paper, telephone, web, PDA, tablet, proxy

**Languages:**
- 3L: 171
- 5L: 133
- Y: 37
### EQ-5D Descriptive system

<table>
<thead>
<tr>
<th><strong>EQ-5D-3L</strong></th>
<th><strong>EQ-5D-5L</strong></th>
<th><strong>EQ-5D-Y</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mobility</strong></td>
<td>I have no problems in walking about</td>
<td>I have no problems in walking about</td>
</tr>
<tr>
<td></td>
<td>I have some problems in walking about</td>
<td>I have slight problems in walking about</td>
</tr>
<tr>
<td></td>
<td>I am confined to bed</td>
<td>I have moderate problems in walking about</td>
</tr>
<tr>
<td><strong>Self-Care</strong></td>
<td>I have no problems washing or dressing myself</td>
<td>I have no problems washing or dressing myself</td>
</tr>
<tr>
<td></td>
<td>I have some problems washing or dressing myself</td>
<td>I have slight problems washing or dressing myself</td>
</tr>
<tr>
<td></td>
<td>I am unable to wash or dress myself</td>
<td>I have moderate problems washing or dressing myself</td>
</tr>
<tr>
<td><strong>Usual Activities</strong></td>
<td>I have no problems doing my usual activities</td>
<td>I have no problems doing my usual activities</td>
</tr>
<tr>
<td></td>
<td>I have some problems doing my usual activities</td>
<td>I have slight problems doing my usual activities</td>
</tr>
<tr>
<td></td>
<td>I am unable to do my usual activities</td>
<td>I have moderate problems doing my usual activities</td>
</tr>
<tr>
<td><strong>Pain/Discomfort</strong></td>
<td>I have no pain or discomfort</td>
<td>I have no pain or discomfort</td>
</tr>
<tr>
<td></td>
<td>I have moderate pain or discomfort</td>
<td>I have slight pain or discomfort</td>
</tr>
<tr>
<td></td>
<td>I have extreme pain or discomfort</td>
<td>I have moderate pain or discomfort</td>
</tr>
<tr>
<td><strong>Anxiety Depression</strong></td>
<td>I am not anxious or depressed</td>
<td>I am not anxious or depressed</td>
</tr>
<tr>
<td></td>
<td>I am moderately anxious or depressed</td>
<td>I am slightly anxious or depressed</td>
</tr>
<tr>
<td></td>
<td>I am extremely anxious or depressed</td>
<td>I am moderately anxious or depressed</td>
</tr>
</tbody>
</table>

**EQ-5D-3L** has 243 health states,

**EQ-5D-5L** has 3125 health states.
EQ-5D-5L health states

- Each of the 5 dimensions comprising the EQ-5D descriptive system is divided into 5 levels of perceived problems:
  - Level 1: indicating no problem
  - Level 2: indicating slight problems
  - Level 3: indicating moderate problems
  - Level 4: indicating severe problems
  - Level 5: indicating extreme problems

- A unique health state is defined by combining one level from each of the 5 dimensions.
- Each health state is referred to in terms of a 5 digit code:
  - 11111 (best health state)
  - 12154
  - 55555 (worst health state)
EQ-5D: Data Elements

1. EQ-5D Health Profile
2. EQ-VAS score
3. EQ-5D Index score
1. EQ-5D Health Profile

- Presenting the frequency or the proportion of reported problems for each level for each dimension.
- Overall, or by subgroup, such as age, sex, presence of disease, before vs. after treatment, treatment vs. comparator, etc.
- Dichotomize into:
  - Level 1: No problems
  - Levels 2, 3, 4, 5: Some problems

### Table: 2014 Alberta Population Norms for EQ-5D-5L

<table>
<thead>
<tr>
<th>EQ-5D-5L Dimension</th>
<th>18-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
<th>70-79</th>
<th>80+</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No problems</td>
<td>730</td>
<td>767</td>
<td>727</td>
<td>542</td>
<td>411</td>
<td>156</td>
<td>68</td>
<td>3,401</td>
</tr>
<tr>
<td>Problems</td>
<td>75</td>
<td>128</td>
<td>157</td>
<td>219</td>
<td>244</td>
<td>127</td>
<td>66</td>
<td>1,016</td>
</tr>
<tr>
<td>Self-Care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No problems</td>
<td>794</td>
<td>869</td>
<td>839</td>
<td>708</td>
<td>606</td>
<td>258</td>
<td>119</td>
<td>4,193</td>
</tr>
<tr>
<td>Problems</td>
<td>12</td>
<td>24</td>
<td>51</td>
<td>53</td>
<td>52</td>
<td>25</td>
<td>14</td>
<td>231</td>
</tr>
<tr>
<td>Usual Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No problems</td>
<td>690</td>
<td>729</td>
<td>721</td>
<td>556</td>
<td>454</td>
<td>183</td>
<td>85</td>
<td>3,418</td>
</tr>
<tr>
<td>Problems</td>
<td>116</td>
<td>163</td>
<td>169</td>
<td>204</td>
<td>203</td>
<td>99</td>
<td>48</td>
<td>1,002</td>
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<tr>
<td>Pain/Discomfort</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No problems</td>
<td>498</td>
<td>455</td>
<td>390</td>
<td>257</td>
<td>199</td>
<td>71</td>
<td>43</td>
<td>1,913</td>
</tr>
<tr>
<td>Problems</td>
<td>308</td>
<td>436</td>
<td>500</td>
<td>503</td>
<td>458</td>
<td>212</td>
<td>90</td>
<td>2,507</td>
</tr>
<tr>
<td>Anxiety/Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No problems</td>
<td>488</td>
<td>599</td>
<td>589</td>
<td>529</td>
<td>442</td>
<td>211</td>
<td>102</td>
<td>2,960</td>
</tr>
<tr>
<td>Problems</td>
<td>316</td>
<td>291</td>
<td>296</td>
<td>232</td>
<td>210</td>
<td>69</td>
<td>31</td>
<td>1,445</td>
</tr>
</tbody>
</table>

Counts of respondents reporting no problems versus problems by EQ-5D-5L dimension and age group.

HQCA Health Quality Council of Alberta
2. EQ-VAS score

We would like to know how good or bad your health is TODAY.

This scale is numbered from 0 to 100.
100 means the best health you can imagine.
0 means the worst health you can imagine.

Mark an X on the scale to indicate how your health is TODAY.
Now, please write the number you marked on the scale in the box below.

Your Health today = 95
3. EQ-5D-5L Index Score

Levels of perceived problems are coded as follows

**Mobility**
- I have no problems in walking about
- I have slight problems in walking about
- I have moderate problems in walking about
- I have severe problems in walking about
- I am unable to walk about

**Self-Care**
- I have no problems washing or dressing myself
- I have slight problems washing or dressing myself
- I have moderate problems washing or dressing myself
- I have severe problems washing or dressing myself
- I am unable to wash or dress myself

**Usual Activities**
- I have no problems doing my usual activities
- I have slight problems doing my usual activities
- I have moderate problems doing my usual activities
- I have severe problems doing my usual activities
- I am unable to do my usual activities

**Pain/Discomfort**
- I have no pain or discomfort
- I have slight pain or discomfort
- I have moderate pain or discomfort
- I have severe pain or discomfort
- I have extreme pain or discomfort

**Anxiety/Depression**
- I am not anxious or depressed
- I am slightly anxious or depressed
- I am moderately anxious or depressed
- I am severely anxious or depressed
- I am extremely anxious or depressed

**Scoring (Canadian Algorithm)**

Health state 21134

EQ-5D-5L index score = 1.1351
-0.0389*MO -0.0458*SC -0.0195*UA -0.0444*PD -0.0376*AD -0.0510*(MO45) -0.0584*(SC45) -0.1103*(UA45) -0.1409*(PD45) -0.1277*(AD45) +0.0085*Num45sq

EQ-5D-5L index score = 1.1351
-0.0389*2 -0.0458*1 -0.0195*1 -0.0444*3 -0.0376*4 -0.0510*0 -0.0584*0 -0.1103*0 -0.1409*0 -0.1277*1 +0.0085*0^2

Health state 21134

EQ-5D-5L index score = 0.5807
EQ-5D-5L Canadian Value Set

- A study to develop a value set for the EQ-5D-5L based on societal preferences in Canada.

- Quota sampling from the general population from 4 cities across Canada (Total N=1073).

- Valuations of EQ-5D-5L health states based on time trade-off (TTO) elicitation techniques.

- A total of 86 EQ-5D-5L health states

- Health state values ranged from -0.148 for the worst (55555) to 0.949 for the best (111111) EQ-5D-5L states

Time Trade-off (TTO)

Which is better, Life A, Life B, or are they about the same?

A

10 years

A & B are about the same

B

10 years

A & B are about the same

EQ-5D Health state 35554

• moderate problems in walking about
• unable to wash or dress myself
• unable to do my usual activities
• extreme pain or discomfort
• severely anxious or depressed

Which is better, Life A, Life B, or are they about the same?

A

5 years

A & B are about the same

B

10 years

X

Full health

EQ-5D Health state 35554

• moderate problems in walking about
• unable to wash or dress myself
• unable to do my usual activities
• extreme pain or discomfort
• severely anxious or depressed

TTO value (health state 35554) = x/t = 5/10 = 0.5
Applications of EQ-5D

- In evaluating effectiveness of services
  - Effectiveness of services and interventions/ programs/ treatments
  - Performance of health service providers

- In assessing population health
  - Describing and monitoring the health status of the population

- In informing clinical practice
  - Screening
  - Management and monitoring of patient outcomes

- In healthcare resource allocation decisions
  - Program evaluation
  - Cost-effectiveness analysis

Which EQ-5D to use?

How and when to administer them?

Utilize EQ-5D data
EQ-5D in evaluating effectiveness of services

Analysis of EQ-5D scores from two phase 3 clinical trials of romiplostim in the treatment of immune thrombocytopenia (ITP) (Sanz et al, Value in Health, 2011)

Data from two international, randomized, placebo-controlled, double-blind, 25-week trials that evaluated the efficacy and safety of romiplostim in adult patients with chronic idiopathic thrombocytopenia (ITP)

N = 125

EQ-5D-3L

Conclusion: Using romiplostim in cases of chronic ITP was associated with improvement in health-related quality of life

<table>
<thead>
<tr>
<th></th>
<th>Romiplostim</th>
<th>Placebo</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ-5D index score</td>
<td>0.05 (0.02)</td>
<td>-0.03 (0.02)</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>n = 76</td>
<td>n = 41</td>
<td></td>
</tr>
<tr>
<td>EQ-5D VAS score</td>
<td>6.42 (2.08)</td>
<td>0.48 (2.59)</td>
<td>0.066</td>
</tr>
<tr>
<td></td>
<td>n = 73</td>
<td>n = 41</td>
<td></td>
</tr>
</tbody>
</table>
EQ-5D in evaluating effectiveness of services

Effect of Frequent Nocturnal Hemodialysis vs Conventional Hemodialysis on Left Ventricular Mass and Quality of Life: A Randomized Controlled Trial (Culleton et al., JAMA, 2007)

To compare the effects of frequent nocturnal vs conventional hemodialysis on change health-related quality of life over 6 months.

52 adults undergoing dialysis

EQ-5D-3L

nocturnal HD 6 times weekly vs. conventional HD 3 times weekly

Conclusion: Compared with conventional HD, frequent nocturnal HD improved quality of life.

Nocturnal HD did not improve the change in EQ-5D index scores from baseline to 6 months compared with conventional HD (between-group difference, 0.05; 95% CI, −0.07 to 0.17; \( P = .43 \)), however, was 0.12 95% CI, -0.005 to 0.25, from prerandomization to 6 months.
# EQ-5D in Population Health

## Welcome to the Interactive Health Data Application

### Alberta Community Health Survey (ACHS) 2014

<table>
<thead>
<tr>
<th>Geography</th>
<th>Sex</th>
<th>Variable</th>
<th>Utility Value</th>
<th>Standard Error</th>
<th>Standard Score</th>
<th>Alberta Utility Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>BOTH</td>
<td>Health Related Quality of Life (EQ5D Canadian utilities range 0 100)</td>
<td>85.80</td>
<td>0.30</td>
<td>0.00</td>
<td>85.80</td>
</tr>
<tr>
<td>Alberta</td>
<td>FEMALE</td>
<td>Health Related Quality of Life (EQ5D Canadian utilities range 0 100)</td>
<td>85.30</td>
<td>0.40</td>
<td>0.00</td>
<td>85.30</td>
</tr>
<tr>
<td>Alberta</td>
<td>MALE</td>
<td>Health Related Quality of Life (EQ5D Canadian utilities range 0 100)</td>
<td>86.20</td>
<td>0.40</td>
<td>0.00</td>
<td>86.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Geography</th>
<th>Sex</th>
<th>Variable</th>
<th>EQ5D-VAS</th>
<th>Standard Error</th>
<th>Standard Score</th>
<th>Alberta EQ5D-VAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>BOTH</td>
<td>Self rated health (EQ5D visual analogue scale 0 100)</td>
<td>80.40</td>
<td>0.30</td>
<td>0.00</td>
<td>80.40</td>
</tr>
<tr>
<td>Alberta</td>
<td>FEMALE</td>
<td>Self rated health (EQ5D visual analogue scale 0 100)</td>
<td>80.20</td>
<td>0.50</td>
<td>0.00</td>
<td>80.20</td>
</tr>
<tr>
<td>Alberta</td>
<td>MALE</td>
<td>Self rated health (EQ5D visual analogue scale 0 100)</td>
<td>80.50</td>
<td>0.40</td>
<td>0.00</td>
<td>80.50</td>
</tr>
</tbody>
</table>

EQ-5D in population health

Health Outcomes Measurement
2014 Alberta Population Norms for EQ-5D-5L

http://hqca.ca/studies-and-reviews/health-outcomes-measurement/
EQ-5D/PROMs in clinical practice

Use of PROMs at the Alberta Bone and Joint Health Institute (ABJHI)
Source: Dr. Deborah Marshall

To describe

To inform

To Predict

<table>
<thead>
<tr>
<th>WOMAC Score @ 3 Months</th>
<th>Coefficient</th>
<th>SE</th>
<th>P</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obese (Y vs N)</td>
<td>-0.16</td>
<td>0.89</td>
<td>0.860</td>
<td>-1.90 1.59</td>
</tr>
<tr>
<td>Pre-Surg WOMAC</td>
<td>0.21</td>
<td>0.02</td>
<td>&lt;0.001</td>
<td>0.17 0.25</td>
</tr>
<tr>
<td>Age</td>
<td>0.01</td>
<td>0.04</td>
<td>0.824</td>
<td>-0.08 0.10</td>
</tr>
<tr>
<td>Male vs. Female</td>
<td>1.47</td>
<td>0.87</td>
<td>0.092</td>
<td>-0.24 3.17</td>
</tr>
<tr>
<td>Knee vs. Hip</td>
<td>-6.97</td>
<td>0.89</td>
<td>&lt;0.001</td>
<td>-8.70 -5.23</td>
</tr>
<tr>
<td>1 Pre-Surg Risk Factor vs. 0</td>
<td>-0.70</td>
<td>0.99</td>
<td>0.483</td>
<td>-2.65 1.25</td>
</tr>
<tr>
<td>2+ Pre-Surg Risk Factors vs. 0</td>
<td>-1.47</td>
<td>1.10</td>
<td>0.182</td>
<td>-3.62 0.69</td>
</tr>
</tbody>
</table>

Patient Decision Aids
Using large scale routine collection of the EQ-5D to enhance patient decision making: A proof of concept study (Bansback, et al.)

Outline of EQ-5D Patient Decision Aid
Using routinely collected EQ-5D data to inform patient-provider decision-making for knee replacement surgery

1. **ABOUT ME...**
   Patient enters relevant clinical and demographic characteristics, and completes the EQ-5D.

2. **MY OPTIONS...**
   Outlines the competing options
   1. Knee replacement surgery
   2. Delay surgery and try other treatments (such as pain medication and exercise).

3. **MY VALUES...**
   Determines which improvements in the EQ-5D domains are the most important to the patient, will present this information first during 'My Choice'.

4. **MY CHOICE...**
   Presents individualized information on changes in EQ-5D domains and asks patients to choose which treatment option they prefer (see side \(\Rightarrow\)).

5. **NEXT STEPS...**
   Tests patients' knowledge, and asks questions about readiness to make a decision, and confidence in decision.

6. **SUMMARY...**
   Summary of treatment options and choice that can be printed, or emailed to the patient or provider.
EQ-5D/PROMs in Healthcare Resource Allocation

- Economic evaluation: Compares the costs and benefits of at least two alternatives.

ICER: Ratio of incremental costs over incremental benefit = \[
\frac{\text{cost (A)} - \text{cost (B)}}{\text{benefit (A)} - \text{benefit (B)}}\]
Economic evaluation: Benefit

- Clinical outcome: blood pressure, HbA1c, lipid levels
- Hospitalization, ED visits, healthcare utilization
- Mortality; life expectancy
- PROM

Cost-effectiveness analysis

Cost-utility Analysis (QALY)
What is a QALY?

- A QALY “Quality Adjusted Life Year”: A measure that takes into account both the **quantity** and **quality** of life.

- A unit of benefit that can be used to assess the extent of the benefits gained from a variety of healthcare interventions **within** and **across** clinical areas in terms of **health related quality of life** and **survival** for the patient.

Incremental cost utility ratio (ICUR):

\[
\text{Ratio of incremental costs over incremental QALY} = \frac{\text{cost (A)} - \text{cost (B)}}{\text{QALY (A)} - \text{QALY (B)}}
\]
QALY calculation

To calculate QALYs, we multiply the length of life gained by the new treatment or intervention by the quality of life a patient will have during that period:

\[(\text{length of life “years”}) \times (\text{quality weight})\]
Example: New Rx improves **quantity** of life

QALY gain = 2.5 – 2 = 0.5 QALYs
Example: New Rx improves quality of life

QALY gain = 2.8 - 2.4 = 0.4 QALYs
Example: New Rx improves both **quality and quantity** of life

QALY gain = 4.8 – 1.5 = 3.3 QALYs
What is the ‘Q’ in the QALY?

- In a QALY calculation, quality of life is measured on a scale anchored at 0 (dead) to 1 (full health).

- This score or ‘weight’ represents the value of different levels of health.

How do we find the Q?
The “Q” in the QALY!

- **Describe the ‘health state’** which is a description of health that combines information about symptoms, effects on functioning and level of severity. Then, *value the health state*.

- There are measures that are designed specifically for generating the ‘Q’ in the QALY; these are known as **preference-based or utility measures** *(EQ-5D)*

\[
\text{QALY} = (\text{length of life “years”}) \times (\text{quality weight})
\]

*EQ-5D index score*
The countries around the world where QALYs are required or recommended for considering drugs or interventions for funding
EQ-5D in healthcare resource allocation

Cost-Effectiveness of Physician Notification and Follow-up or Collaborative Care for Patients with Diabetes Who Screen Positive for Depression in Primary Care: Results from a Controlled Trial (Johnson et al. American Journal of Preventative Medicine, in press)

To evaluate the cost-effectiveness of three strategies to improve depressive symptoms in patients with T2D (N=227)

Interventions: Usual care vs. screening for depression & physician notification vs. comprehensive care model.

HRQL measure: EQ-5D-5L. Measurement: 0, 6, 12 mon

Conclusion: Physician notification and follow-up is a clinically effective strategy compared with usual care, but investing more up-front resources in collaborative care yielded the most cost-effective strategy.

Cost-Effectiveness Analysis Based on Quality-Adjusted Life-Years (Cost-Utility analysis)

<table>
<thead>
<tr>
<th>Arm</th>
<th>Average Cost($)</th>
<th>Incremental Cost($)</th>
<th>Average Effect</th>
<th>Incremental Effect (QALY)</th>
<th>ICUR ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual Care</td>
<td>5889 [13283]</td>
<td>-</td>
<td>0.685 [0.179]</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Enhanced Usual Care</td>
<td>6339 [11841]</td>
<td>450 [-3814, 4727]</td>
<td>0.691 [0.188]</td>
<td>0.006 [-0.067, 0.069]</td>
<td>76,271</td>
</tr>
<tr>
<td>Collaborative Care (Compared with Usual Care)</td>
<td>6910 [10720]</td>
<td>1021 [-2750, 4775]</td>
<td>0.727 [0.165]</td>
<td>0.042 [-0.011, 0.096]</td>
<td>24,368</td>
</tr>
<tr>
<td>Collaborative Care (Compared with Enhanced Care)</td>
<td>6910 [10720]</td>
<td>571 [-3129, 4241]</td>
<td>0.727 [0.165]</td>
<td>0.036 [-0.023, 0.095]</td>
<td>15,861</td>
</tr>
</tbody>
</table>
EQ-5D in healthcare resource allocation

Cost-Effectiveness of Physician Notification and Follow-up or Collaborative Care for Patients with Diabetes Who Screen Positive for Depression in Primary Care: Results from a Controlled Trial (Johnson et al. American Journal of Preventative Medicine, in press)

Cost-Effectiveness Acceptability Curve Based on Quality-Adjusted Life-Years (QALYs)

[Diagram showing Cost-Effectiveness Acceptability Curve]

- Usual Care
- Enhanced Usual Care
- TeamCare Intervention

Probability Cost-Effective (%)

Willingness to Pay for an Additional QALY($)
Thank you

Not everything that counts can be counted, and not everything that can be counted counts (A. Einstein)

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