The Assessment of Quality of Life (AQoL) Instruments

Multi Instrument Comparison Study

Centre for Health Economics

Check the website and contact us:

www.AQoL.com.au
The Instruments

What is AQoL?
- The AQoL instruments are Multi-Attribute Utility (MAU) instruments for measuring health state ‘utility’
- There are 5 AQoL instruments: AQoL-8, 4D, 6D, 7D, 8D
- Each instrument contains dimensions (pain, depression, etc) for profiling health states
- Scoring formulae are available in SPSS and STATA on the website

Why use the AQoL?
- Good evaluation requires instruments which are sensitive to the health states they measure
- The sensitivity of existing instruments varies greatly and utility scores are inconsistent
- The AQoL instruments were created to increase measurement sensitivity, especially in the psychosocial dimensions
- Questionnaires take between 2-6 minutes to complete

Why were AQoL instruments created?
Evidence has shown that utility scores from existing instruments (the EQ-5D, HUI 3, SF-6D, 15D, QWB) differ significantly.

This is illustrated in Figure 2 below with data from a relatively healthy group [4]. Each graph plots an individual’s score on one instrument (X) against their score on a second instrument (Y). If the instruments both measured the same quantity (utility) then the scores would be the same. The equation for the best fitting line between points would be X=Y and points on the graphs would all lie on the dotted line. In contrast, the best fitting lines differ significantly from this and the variance (scatter of points around the line) is very large.

The two most comprehensive studies to date found similar results. Only about half the variance in the scores of any MAU instrument could be explained by another MAU instrument [1, 2].

A draft review of MAU instruments for the forthcoming AJ Culyer Encyclopedia of Health Economics may be found in Richardson et al. [3].

How do AQoL instruments differ from other instruments?
- Use of theoretically correct psychometric construction methods
- Multi-tier descriptive systems to increase sensitivity
- Provision of dimension scores, each representing psychometrically valid scales for profiling health states
- Provision of reliable and valid utility scores for the largest number of health states to date.
The Multi Instrument Comparison (MIC) Project

The MIC project administered 12 instruments and a Self TTO (time trade-off self-assessment) in 6 countries and included quotas of people in 7 chronic disease areas. The project involves collaboration with QoL researchers in Australia (Richardson, Cummins), the USA (Kaplan), UK (Coast), Norway (Olsen), Germany (Schlander) and Canada. By August 2012 the number of responses was 7,720.

Table 1 Country and disease area summary

<table>
<thead>
<tr>
<th>Countries</th>
<th>Australia, USA, UK, Norway, Germany, Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease areas</td>
<td>Healthy (no disease), Arthritis, Asthma</td>
</tr>
<tr>
<td></td>
<td>Arthritis, Asthma, Cancer, Heart disease</td>
</tr>
</tbody>
</table>

Instruments

- Subjective wellbeing (Happiness): PWI, IHS, SWLS
- Multi attribute utility (MAU): EQ-5D-5L, SF-6D, HUI 3, 15D, QWB, AQoL-4D, AQoL 8D
- Multi attribute (MA) (non utility): SF-36
- Capabilities: ICECAP-A
- Other: SELF TTO, Demographics, SES

Source: MIC Project User Manual: Data Description and Use

(ii) Convergent Validity: Figures 4-6 show correlation coefficients. The Intra Class Correlation (Figure 4) indicates how close (or not) absolute scores are to one another. The results show they are not very close for measures which should be identical.

Results from the MIC Project

Preliminary analyses of Australian data are available online in Richardson et al. [5]. Some results are shown below.

(i) Frequencies: Figure 3 shows the frequency distribution of EQ-5D-5L, SF-6D and AQoL-8D for 1,436 individuals. The more sensitive AQoL-8D descriptive system results in a more satisfactory distribution. It has minimal ceiling effects (U=1.0; EQ-5D 16%; AQoL-8D 1.6%) and plausible lower values for a sample where 80% had one of the listed diseases (U< 0.4; SF-6D 1.4%; AQoL-8D 10.6%).

(ii) Convergent Validity: Figures 4-6 show correlation coefficients. The Intra Class Correlation (Figure 4) indicates how close (or not) absolute scores are to one another. The results show they are not very close for measures which should be identical.

Figure 3 Frequency distribution of MAU instruments (n = 1,436)

Figure 4 Average Correlation with 7 other instruments

Figure 5 Correlation with Happiness*

*Happiness measured by ‘Satisfaction with Life Survey’

Figures 5 and 6 display the correlation of instrument scores with happiness and with the Self TTO (which requires respondents to trade their present health state for a shorter improved life). The correlation of happiness (SWLS) with AQoL-8D (0.7) is 75% greater than with EQ-5D (0.4). Correlation with the Self TTO indicates that the AQoL-8D more closely reflects individuals’ assessment of own health than other instruments.

Figure 6 Correlation of MAU instruments with Self TTO

Figure 7 Sensitivity to psycho-social versus physical dimensions

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(iii) What is measured (Content Validity): The correlation between an instrument and the two SF-36 summary scores for physical and for psycho-social health give an indication of the instrument’s sensitivity to physical and psycho-social health. Figure 7 gives the ratio of these correlations. It therefore indicates the relative sensitivity of an instrument to these two broad dimensions. Figure 7 reveals that the AQoL-8D has about double the relative sensitivity to psycho-social health of the EQ-5D as measured by the SF-36 summary scores.

Figure 8 shows the importance of different health dimensions in ‘explaining’ variation in ‘utility’ as measured by different instruments. Results were derived from the multiple regression of ‘utility’ upon the dimension scores of the SF-36. They therefore show the importance of dimensions after standardizing for differences in other dimensions. For example when the dimensions of the SF-36 all increase by 1 standard deviation, pain and mental health account for 42.1% and 15.0% of the total increase in the EQ-5D respectively, as shown by the red and orange segments in Figure 8. In contrast, with the same increase in SF-36 dimension scores, pain and mental health account for 30.1% and 25.2% of the total increase in the HUI 3. Overall Figure 8 demonstrates dissimilarity in the ‘content’ of different instruments.

(v) Profiling health states: Like the SF-36, AQoL-8D has 8 validated dimensions and 2 summary dimensions for physical and psycho-social health which are available to profile health states. The correlation of the SF-36 and AQoL-8D summary scores with 4 MAU instruments, shown in Figure 10, indicates a closer relationship with AQoL-8D than with SF-36 summary scores.

Preliminary Conclusion
The chief conclusion from preliminary analysis is that different MAU instruments measure different ‘constructs’. The term QoL refers to something different in each instrument: the ‘utility’ produced by each instrument therefore measures preferences for a different concept of QoL.

Data Availability
From January 2014 the full database and AQoL manual will be available on the AQoL website. Before this, selected data may be obtained from the MIC team for projects which are not being undertaken by the team (contact angelo.iezzi@monash.edu). Australian data are currently available. From November 2012 selected data from the UK, US, Canada and Norway will be available.

Examples of Frequently Asked Questions
These include general questions. Examples include:
- Why use an MAU instrument?
- Should we use a single MAU instrument? (No: the implied logic is incorrect unless the instrument is perfect. Analogously we would not achieve comparability in the measurement of medical need through the use of a single and insensitive indicator such as blood pressure. In fact, use of a single insensitive instrument guarantees discrimination against some classes of intervention. Other current instruments discriminate particularly against mental health services.)

References