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THE QALY TOOLKIT

by

CLAIRE GUDEX and PAUL KIND

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The Authors

Claire Gudex and Paul Kind are Research Fellows in the Centre for Health Economics at the University of York.

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Contents

Abstract

QALYs (quality adjusted life years) represent a powerful addition to the range of evaluative techniques for use in assessing the impact of health care. In the past such benefits have been portrayed in terms of their contribution to life expectancy. The ability to adjust for quality of life is an important step which permits comparisons to be made between specific forms of intervention, and between competing programmes of health care. The measurement of quality of life is fundamental to the calculation of QALYs and is achieved, in this case, by using an index first described by Rachel Rosser (now Professor of Psychiatry, Middlesex Hospital, London).

This "toolkit" brings together all the relevant background information on measuring QALYs. The Paper sets out the background to the Rosser index, including both the descriptive classification of disability/distress states and their associated valuations. It also presents examples of the methods which have been used to compute QALYs - by reprocessing published data and consulting specialist reference groups. A self-completed questionnaire which yields Rosser ratings has been developed by the York QALY team for use in survey settings. The questionnaire is included as an Appendix, together with instructions in encoding response data.

Policy choice has to be informed by data about the costs and outcomes of therapies and programmes competing for scarce and limited resources. This QALY toolkit, in conjunction with cost data, will enable policy makers to identify cost-effective policies and ensure choices give good value for money to public and private sector health care systems.

The QALY Toolkit

Over the past few years interest has been growing in the concept and application of quality of adjusted life years (QALYs) (Weinstein, 1977, 1985; Kaplan, 1984; Williams 1985). Health care benefits can be expressed in terms of increased life expectancy which may, or may not, be associated with improved quality of life. QALYs represent a means of overcoming the historical emphasis on survival data as the dominant measure of benefit. Whilst survival data are often easily accessible, quality of life data are not routinely recorded. In recent work undertaken by research staff at York University, quality of life (QoL) data have been generated in a number of different ways. In each case these QoL data have been expressed in terms of a classification first put forward by Rachel Rosser in research published in the 1970s (Rosser & Watts, 1972).

This paper describes the derivation and development of the Rosser index, and its use as a measure of quality of life. The first of two sections summarises the methods used by Rosser in describing illness states and gives details of the psychometric techniques used to elicit valuations from different groups of subjects. The second section presents the examples of the ways in which QALYs have been calculated using the Rosser index:

(1) by reprocessing information from published sources e.g. evaluating benefits in end-stage renal failure

(2) by eliciting the views of specialists in particular disease groups e.g. in coronary artery disease

(3) by surveying the community.

A fuller account of the first two examples have been previously published elsewhere (Gudex, 1986 and Williams, 1985), and the summaries presented here only describe the mechanics of calculating QALYs, based on QoL measurements expressed in terms of the Rosser descriptions and valuations. So that observations of disability and distress can be collected in surveys and directly from patients, a self-completion form of the original instrument has been devised. The questionnaire is associated with a series of decision rules for synthesising the Rosser states, and these are set out as part of the second section of this paper. A listing of relevant QALY papers is given in the Appendix 3.

1. DEVELOPING THE ROSSER INDEX

1.1 Description

Rosser developed her descriptions of states of illness on material initially generated by small groups of doctors. They were asked to describe the criteria they used to decide on the severity of illness in the patients. They were asked quite specifically to only consider the present state of the patient, and any prognostic implications were to be excluded. Diagnosis was rejected from the outset as being too complex for the purposes of describing patient's severity of illness. Two principal components of severity ultimately emerged from these discussions - observed disability (loss of function and mobility) and subjective distress. All other aspects of the patient's condition were thought to be subsumed within this framework. This descriptive system was used to classify an initial set of 40 patients and subsequent refinement was made, following discussion of the results with groups of doctors. The system which was eventually agreed comprised of 8 levels of disability and 4 levels of distress (see Figure 1).

Figure 1 Rosser's Classification of Illness States

DISABILITY

I No disability

II Slight social disability

III Severe social disability and/or slight impairment of performance at work
Able to do all housework except very heavy tasks

IV Choice of work or performance at work very severely limited
Housewives and old people able to do light housework only but able to go out shopping

V Unable to undertake any paid employment
Unable to continue any education
Old people confined to home except for escorted outings and short walks and unable to do shopping
Housewives able only to perform a few simple tasks

VI Confined to chair or to wheelchair or able to move around in the house only with support from an assistant

VII Confined to bed

VIII Unconscious

DISTRESS

A. No distress

B. Mild

C. Moderate

D. Severe

A second, separate attempt to generate a classification of illness severity, was conducted with non-medical subjects. Groups of economists and health administrators were asked to recall two individuals who they considered to be ill, and two individuals thought to be healthy. The characteristics which differentiated ill and healthy individuals were then listed. The most frequently cited characteristics related to disability (impaired mobility and function), and distress (pain). Rosser concluded that both medical and non-medical reference groups supported similar classification systems.

The descriptions of health states which had emerged from Rosser's consensus exercise with her colleagues were tested in two ways. Firstly, doctors' ratings of patients were examined to see whether they could use these descriptions to categorise patients reliably, accurately and quickly. The disability/distress classification was incorporated in a study of patients admitted to a Teaching Hospital over a one month period (Rosser and Watts, 1972). A total of 2,120 patients were rated on admission by some 50 collaborating doctors from a wide variety of specialties, including ENT, Gynaecology, Urology, Ophthalmology, Psychiatry, as well as General Medicine and Surgery.

A single training session was necessary to achieve high levels of agreement between raters. Test-retest reliability was also high. The patients ratings were also recorded by their doctors at the time of discharge. The distribution of disability/distress states, as shown in Figure 2, reveals a general shift in pattern towards the less severe states around IA (no disability/no distress). Benson (1978) in a separate validation exercise, examined nurses' performance in using the disability/distress classification to rate patients' illness states. In both these instances the descriptive system was found to be reliable and

Figure 2 : Patients' disability/distress states at admission and discharge

Disability state	Distress state					
	A	B	C	D		
I	19	12	3	1	35	I
II	10	12	3	1	26	
III	1	3	1	1	6	
IV	3	3	5	1	12	
V	1	3	4	2	10	
VI	1	1	2	0	4	
VII	1	2	3	1	7	
VIII	0	0	0	0		
Total	36	36	21	7		

Classification of patients on admission

Disability state	Distress state				
	A	B	C	D	
I	33	10	1	0	44
II	21	11	1	0	33
III	2	3	1	0	6
IV	3	4	1	0	8
V	3	2	2	1	8
VI	0	0	1	0	1
VII	0	0	0	0	
VIII	0	0	0	0	
Total	62	30	7	1	

Classification of patients on discharge

easily used (typically taking 10 seconds to rate a patient). The usefulness of such a means of describing patients' severity of illness could obviously be greatly enhanced, given some means of differentially weighting the disability/distress states.

1.2 Valuation

Six widely dispersed states of the 29 disability/distress states were selected as representing the full range of illness states. These states (IC, IID, VC, VIB, VIIB, VIID) were subsequently referred to as "marker states".

Rosser conducted a series of structured interviews with 70 subjects with different current health experiences. All subjects carried out a magnitude estimation exercise in which they were asked initially to place the six marker states in rank order of severity. The subject was then presented with his first two cards, (i.e. the least ill states) and was asked 'how many times more ill is a person in state two as compared with state one?'. In considering their response, the subjects were told to assume that

(a) the descriptions related to a young to middle-aged adult.

(b) all states have the same prognosis and could be cured if the patient is treated. If left untreated the patient's condition would remain static until some other condition supervenes.

The question was then repeated using successive pairs of marker states (2&3, 3&4, 4&5, 5&6). The subjects were encouraged to take as much time as they required in order to complete this task. In making a judgement about the relative severity of the various marker states subjects were asked to bear in mind a number of implications that might influence their decision. Firstly, the ratio selected for two marker states would determine the distribution of NHS resources to those states. Secondly, the ratio defined a point at which subjects were indifferent between curing one patient in the more severe state, and curing a number of patients in the less severe state. The value for each ratio was multiplied by that for the succeeding ratio -

for example, given ratios for the 6 markers (a,b...f) as follows

a:b	1:3
b:c	1:6
c:d	1:12
d:e	1:4
e:f	1:5

Marker states would receive scores of

a	b	c	d	e	f
1	3	18	216	864	4,320

The ranked marker states and their provisional scores provided a framework within which the remaining 23 states were ranked. Subjects were free to change the position of all states at any time. Once the ranking had been decided the <u>scores</u> for all intermediate states were established. In particular the subject was asked to assign a score of zero to the state to which he/she thought it reasonable to restore all patients. During this valuations task subjects were again reminded that the value for any state could be modified.

At this point the subjects were asked to change the initial assumptions about prognosis, and to consider that the descriptions now applied to permanent states, none of which would be treated. Any changes to their valuations were noted. The final element in this procedure involved subjects locating death amongst the disability/distress states and placing a valuation on it.

1.3 Results

As is often the case with such data the distribution of scores was widely dispersed. Statistical analysis of these psychometric data revealed significant differences between medical and psychiatric patients, medical patients and doctors, medical nurses and doctors. Closest agreement was evident in the responses of patients and their nurses. No significant differences were detected in valuations when subjects were regrouped according to individual characteristics - including age, sex, social class, religion and past history of illness.

Doctors place relatively less emphasis on the importance of death in comparison with other states; their valuations resembled those of healthy volunteers and differed from those of patients and nurses. Doctors also placed more emphasis on the importance of subjective suffering.

The median valuations collected from Rosser's 70 subjects were originally published in a form which fixed the score for the healthy state IA as zero, but left all other states with unconstrained scores. Subsequently these scores were transformed* so that death received a score

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* $$V'_{ij} = 1.0 - \frac{V_{ij}}{D}$$

Where V_{ij} is the original score for the i^{th} disability state/j^{th} distress state, and D is the score assigned to death

Figure 3: Transformed valuations for 29 health states

	Distress			
Disability	A	B	C	D
I	1.000	0.995	0.990	0.967
II	0.990	0.986	0.973	0.932
III	0.980	0.972	0.956	0.912
IV	0.964	0.956	0.942	0.870
V	0.946	0.935	0.900	0.700
VI	0.875	0.845	0.680	0.000
VII	0.677	0.564	0.000	-1.486
VIII	-1.028	-	-	-

FIXED POINTS: HEALTHY = 1 DEAD = 0

See: Kind, Rosser and Williams (1982).

of 0 and IA received a score of one. It is this latter scale (see Figure 3 above) which has provided the valuations for use in QALY applications.

Transformed valuations for each of the 6 subject groups are listed for completeness in Appendix 1.

2. CALCULATING QALYs

2.1. Reprocessing information from published sources

Quality of life is not often the primary focus where clinical researchers are concerned with evaluating the differential effects of alternative treatments. Their data may be more closely allied to observing direct clinical effects and only inferentially associated with notions of quality of life. It is something of a rarity to discover a prospective study in which quality of life is the central research issue (for example Croog et al., 1986 - a QoL study of the treatment of hypertensives). In the absence of a single, standard measure QoL data in such studies are likely to be based upon one of a handful of measurement instruments. In order to achieve comparability with previous QALY studies, such data have to be reprocessed. The first example in this section taken from Gudex (1986), deals with such secondary data analysis, where information thought to reflect quality of life is translated into equivalent disability/ distress states.

Data from published studies were used to calculate quality of life for patients on home and maintenance haemodialysis, CAPD, and after renal transplant.

Procci (1980) in a study of psychosocial disability assessed 16 males on maintenance haemodialysis using the Ruesch Social Disability Rating Scale (Ruesch et al 1972) which generates three subscores:

- Physical Impairment (PI)
- Behavioural Impairment (BI)
- Social Modifiers (SM)

In this numerical rating scale, scores for PI and BI are compared and the higher of the two added to the MS score to yield an overall Disability Score (DS).

These data were interpreted as the basic information for deciding the appropriate disability/distress states. The Disability Score was used to place patients into the Rosser Disability Categories as below.

Disability Score	Rosser Disability Category		No. Patients
DS < 20	I	No Social Disability	0
DS 20-49	II	Minor Social Disability: can continue as usual with home or occupational activities	6
DS 50-79	III-V	Major Social Disability: must alter work program, if patient can work at all, rely on regular outside help	10
DS 80-109	VI-VIII	Total Social Disability: 24 hour full care or in an institution	0

The Ruesch Rating Scale describes the Social Modifiers score as reflecting the impact that physical or behavioural impairment has upon the patient's life, and this was felt to have the greatest correspondence with the Rosser distress dimension.

Social Modifier Score	Rosser Distress Category		No. Patients
1-5	A	No Distress	0
6-19	B	Mild Distress	11
20-39	C	Moderate Distress	3
40-55	D	Severe Distress	2

The published data for individual patients were reprocessed according to these decision rules, and the distribution in terms of their disability/distress categories is as follows

		DISTRESS				
		A	B	C	D	
DISABILITY	I	0	0	0	0	0
DS	II	0	6	0	0	6
(50-59)	III	0	5	3	0	8
(60-69)	IV	0	0	0	0	0
(70-79)	V	0	0	0	2	2
	VI	0	0	0	0	0
			11	3	2	16

Each cell in this descriptive matrix is associated with a corresponding weight in the valuation matrix (see Figure 3). A total QoL score for this patient group can be computed by reading off the relevant weight:

[6x0.986] + [5x0.972] + [3x0.956] + [2x0.7] = 15.05

The average QoL score for this patient group is therefore 0.94.

There is some uncertainty about the survival data for patients on maintenance dialysis. Periods of survival of between two and ten years were used to construct a range of QALY scores (all expressed in terms of present value by discounting at a 5% rate) and these QALY gains are given in the table below.

Identical decision rules were applied to published data relating to a group of 16 males who had a well-functioning cadaver transplant, and the resulting distribution of patient states is given below.

		DISTRESS				
		A	B	C	D	
DISABILITY	I	0	0	0	0	0
	II	0	5	0	0	5
	III	0	3	5	0	8
	IV	0	0	2	0	2
	V	0	0	1	0	1
	VI	0	0	0	0	0
		0	8	8	0	16

Following the same steps in the computation of the QoL score produced an average figure of 0.96. Quality of life data have been extracted from other comparable sources (Evans, 1985; Bonney, 1978) and similarly subjected to reanalysis.

For the purposes of these examples it was assumed that without treatment by dialysis or transplant, a patient with severe renal failure would have a very limited life expectancy, hence the alternative to treatment was effectively death. The discounted QALY scores computed for these studies therefore represent the full gain per patient. A more extensive account of the variation between results based on the different studies is given in Gudex (1986).

Survival (Years)	2	4	6	8	10
Haemodialysis					
Bonney et al	1.5	2.9	4.2	5.3	6.3
Procci	1.8	3.3	4.8	6.1	7.3
Renal transplant					
Procci	1.8	3.4	4.9	6.2	7.4
Evans et al	1.8	3.4	4.9	6.3	7.5

Table 1: QALY gains based on 4 studies of end-stage renal failure

2.2. Calculating QALYs: Eliciting views from selected reference groups

In the absence of published data on QoL, an alternative means of generating these data is to draw on the experience of selected reference groups. These might include doctors, nurses and other providers of health care, as well as patients and their families.

In a study of the benefits of coronary artery bypass grafting (Williams, 1985), three cardiologists were asked to give their judgement on the comparative profiles of health of various patients with angina who had, or had not, undergone coronary artery bypass grafting. The cardiologists were asked to distinguish cases of severe, moderate, and mild angina and to express the profiles in terms of the Rosser disability/distress classification.

Figure 4 shows the results of such an exercise, representing the quality of life profiles that Respondent 'A' estimated for a 55 year old man with severe angina and left main vessel disease. The average profiles for the groups of cardiologists are shown graphically in Figure 5.

There are a number of steps in the calculations of QALYs from these data and these are outlined here.

Step 1

The calculation of QALYs for medical and surgical management are performed separately. As a preliminary task the QoL profiles for each are translated into tabular form and the corresponding valuations are extracted from the Rosser matrix (figure 3).

Step 2

The benefits of future life years are converted into present values by using standard discount tables. This is done to account for the perceived reduction in value of benefits which are received at some time in the future, rather than immediately. Benefits in terms of survival and quality of improvement are thus treated similarly to financial benefits. A 5% discount rate has been used in these QALY applications. Discount factors for a 15 year period are given in table 2.

In the current example a QoL score of .956 (corresponding to level IVB) is discounted in year 2 by a factor of 0.907, giving a discount score

Figure 4 : Estimated Profile of a Patient with Coronary Heart Disease

RESPONDENT ....A...........

CONDITION ....SEVERE........... ANGINA WITH .....Left main..... VESSEL DISEASE

(Male, aged 55 years) ....

PTCA

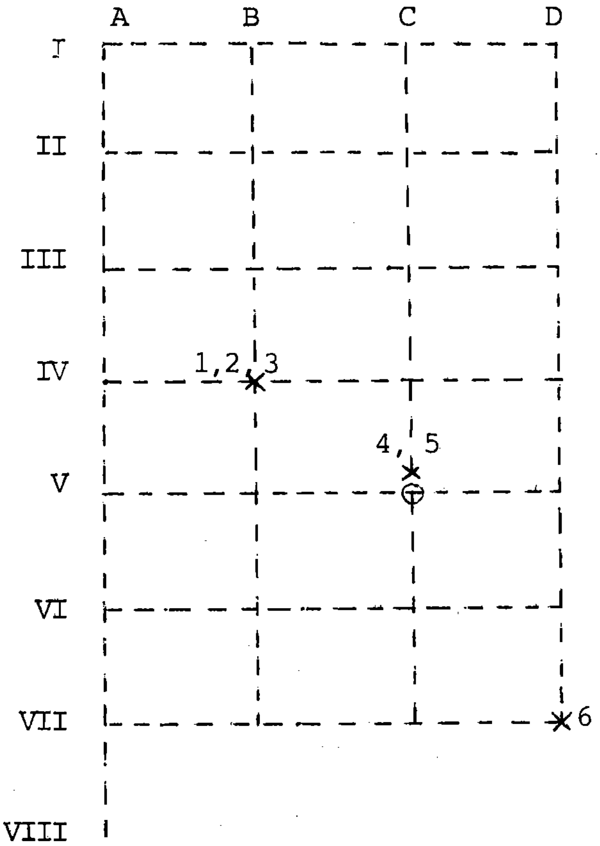
Av. life expectancy ...5... years

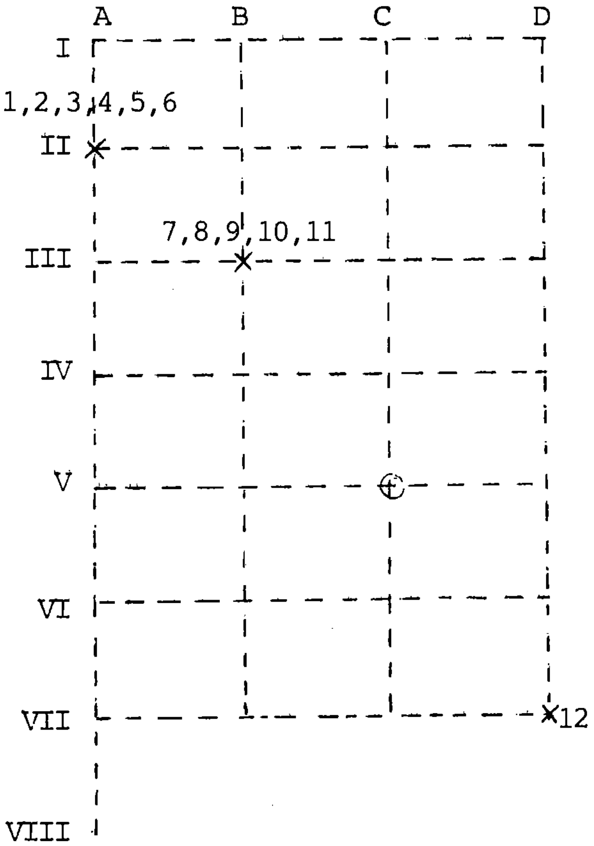
CABG

Perioperative mortality ...3... %

Average life expectancy ...11... years (excluding perioperative mortality

Cases where no symptomatic relief ...30... %





Notes: Place "O" on each grid to represent the typical state of a patient at the time of referral (thus it should be identically placed on both grids).

Thereafter denote by 1, 2, 3, ... etc. the state in which you would expect a successfully treated patient to be at each successive annual interval thereafter, ceasing with the year corresponding to average life expectancy.

Figure 5: Expected value of quality and length of life gained for patients with severe angina and left main vessel disease

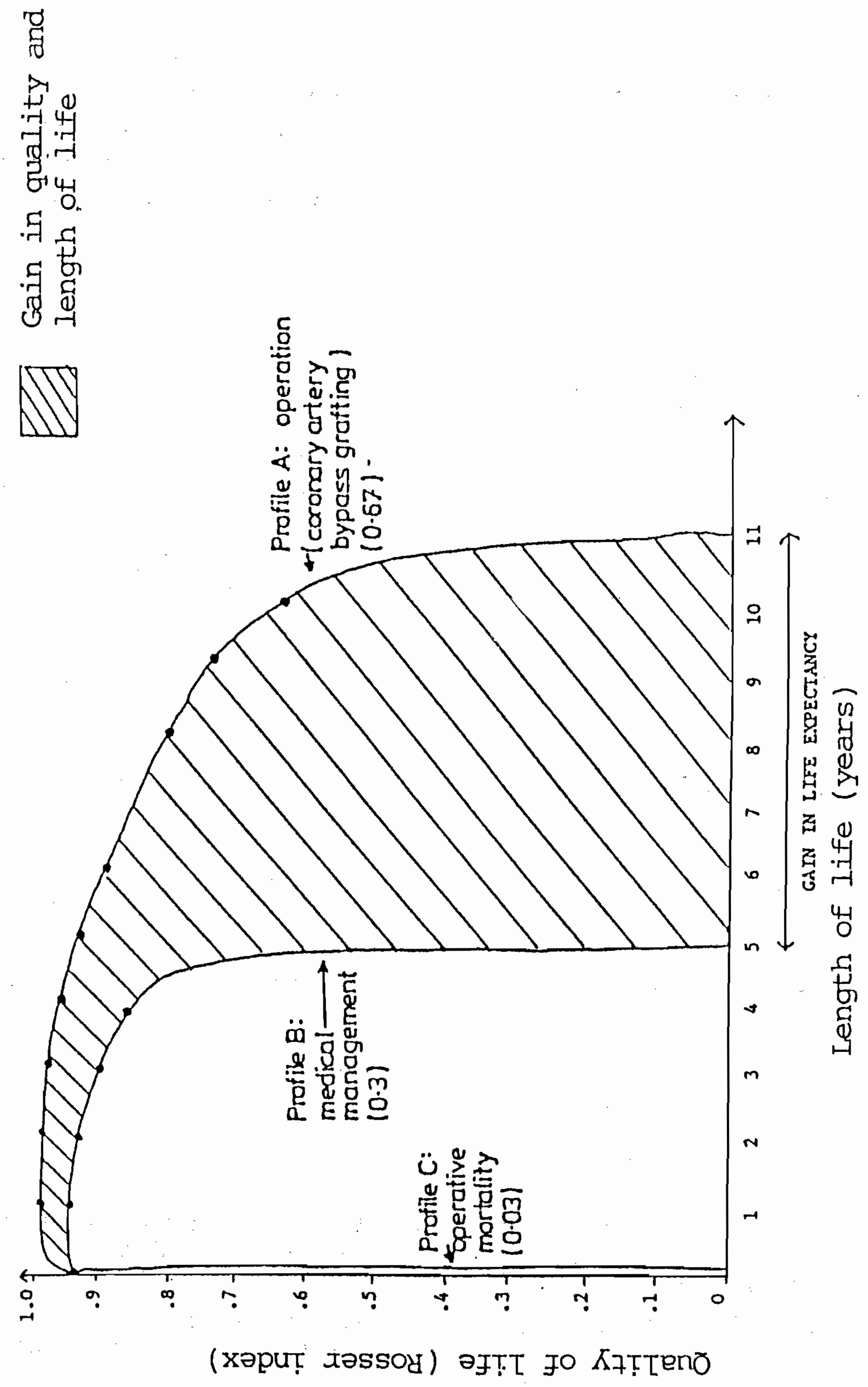


Table 2 : Discount factors for a 5% rate

Year	Discount factor
1	0.952
2	0.907
3	0.864
4	0.823
5	0.783
6	0.746
7	0.711
8	0.677
9	0.645
10	0.614
11	0.585
12	0.557
13	0.530
14	0.505
15	0.481

(See Sugden and Williams, 1978)

Table 3 : Calculation of QALYs

Medical Management					Surgical Management			
Year of remaining life	QoL level	QoL score	Discount factor	Disounted QoL score	QoL level	QoL score	Discount factor	Discounted QoL score
1	IVB	.956	.952	.910	IIA	.99	.952	.942
2	IVB	.956	.907	.867	IIA	.99	.907	.898
3	IVB	.956	.864	.826	IIA	.99	.864	.855
4	VC	.900	.823	.741	IIA	.99	.823	.815
5	VC	.900	.783	.705	IIA	.99	.783	.775
6	dead				IIA	.99	.746	.738
7					IIIB	.972	.711	.691
8					IIIB	.972	.677	.658
9					IIIB	.972	.645	.627
10					IIIB	.972	.614	.597
11					IIIB	.972	.585	.569
12					dead			
TOTAL		4.668		4.049		10.80		8.165

of .867. The full set of computations for medical and surgical profiles is given in table 3.

Step 3

The total discounted QoL score for medical and surgical management are 4.049 and 8.165 respectively. The QALY gain from surgical management is represented by the difference between these two figures

i.e. 8.165 - 4.049 = 4.116

This represents the total theoretical QALY gain which has to be adjusted as follows:

(a) An estimated 30% of patients have no symptomatic relief after surgery hence the maximum QALY gain becomes

(1.0 - 0.3) x 4.116 = 2.881

(b) Peri-operative mortality is estimated at 3%. Patients who die will lose QALYs which might have been gained had they been managed medically. Their QALY loss is given by

0.03 x 4.049 = 0.121

Taking this further adjustment into account the net QALY gain per patient resulting from CABG over medical management is given by

2.881 - 0.121 = 2.76 QALYs.

2.3. Calculating QALYs: Collecting Disability/Distress Data Using a Self-Completed Questionnaire

The use of the Rosser Index as a means of adjusting for quality in the calculation of treatment benefits, has until now rested upon (a) the availability of suitable data which could be converted into corresponding disability/distress states, and (b) the readiness of clinicians and other health professionals to record ratings on patients based on their own clinical knowledge and experience.

Where studies involve prospective data collection then patients, doctors and others can be used as a source of QoL information. In order to facilitate this process, the York group (together with Dr. Jane Adam, Department of Community Medicine, York Health Authority) have designed a questionnaire (see Appendix 2). In its self-administered form the questionnaire takes no more than 10 minutes to complete.

The questionnaire has been used on a range of subjects including physiotherapy outpatients, attenders at a day care hospital for the elderly, and medical in-patients with psychiatric problems. It has also been used in a community survey in the West Midlands and in a randomised controlled trial of diagnostic techniques for posterior fossa lesions.

The West Midlands survey also collected data using other health status/QoL measures including questions from the General Household Survey, the Nottingham Health Profile and the General Health Questionnaire. These data will be published in due course.

Converting questionnaire responses into Rosser categories

Access to the valuations contained within the Rosser Index, depends upon the ability to categorise an individual in terms of their disability and distress states. The information collected via the York QoL questionnaire is designed to produce Rosser categories which correspond to the ratings which would have been made by an observer. The decision rules for converting questionnaire responses into Rosser categories were embodied in the original construction of the questionnaire.

Assignment rules for disability rating

The questionnaire responses are coded by the scoring convention shown below.

Questionnaire dimension	Code	Scoring Convention	Range of possible scores
General mobility	GM	Levels scored in order of presentation	1 - 6
Self-care	SC	Score 1 for each item requring any difficulty	0 - 4
Usual activity	UA	Levels scored in order of presentation	1 - 4
Social and personal relationship	SP	Score 1 for each "YES" response	0 - 4

In the table below, first move to the appropriate column, using the General Mobility response (or "not conscious"). For GM4 to GM6 and for "not conscious", no futher information is required, the Rosser disability categories being V, VI, VII and VIII respectively.

For GM1 to GM3, start with the "usual activity" (UA) response. If UA = 1 (i.e. not affected) one of the first 3 rows will be relevant. If UA = 2 (i.e. slightly affected) one of the next 2 rows will be relevant. If UA = 3 or UA = 4, the Rosser disability category will be IV and V respectively.

For the first five rows the scores on Self-care and Social and Personal Relationships will be relevant, as indicated in the table.

Table for Assigning Respondents to Rosser Disability Categories

General Mobility (GM) Other Responses	1	2	3	4	5	6	Not Conscious
UA=1 SC=0 and SP=0	I	II	III	V	VI	VII	VIII
UA=1 SC=1 or 2 or SP=1 or 2	II	II	III				
UA=1 SC=3 or 4 or SP=3 or 4	III	III	IV				
UA=2 BUT SC<3 AND SP<3	III	III	III				
UA=2 SC>3 OR SP>3	III	III	IV				
UA=3	IV	IV	IV				
UA=4	V	V	V				

Assignment rules for distress rating

Measure position of cross on the visual analogue scale in mm, with 0 at left end and 100mm at right end. Treat this as the distress "score". Only the scores from the first 13 visual analogue scales are used (i.e. "Feeling Sad or Depressed" to "Feeling Dependent on a Machine for my Health"). The remaining scales do not relate directly to the Rosser Index, and have been included in the questionnaire as part of the collection of a wider data set.

Distress Scores (VAS 1 to 13)	Rosser Distress Category
If all scores ≤ 30	A
Highest score is > 30 and ≤ 60	B
Highest score is > 60 and ≤ 90	C
Highest score is > 90	D

The decision rules used to synthesise the disability/distress states which are described in this section, have been applied to the West Midlands survey data and produced a distribution for 390 respondents as shown in figure 6.

Seventy five percent of the sample are categorised as having no disability (level I); 55% have no distress (level A). Six per cent are unable to undertake paid employment or are housebound except when supported by others, or are confined to a chair or wheelchair (disability levels V and VI). Some 10% are classified as having severe distress (level D).

Figure 6 : Distribution of disability/distress states for a sample of the community

DISTRESS DISABILITY	A	B	C	D	
I	187	60	30	14	291 (74.6)(%)
II	12	13	8	6	39 (10.0)
III	10	4	11	7	32 (8.2)
IV	-	-	3	3	6 (1.5)
V	4	3	7	7	21 (5.4)
VI	-	-	-	1	1 (.3)
Column Total (%)	213 (54.6)	80 (20.5)	59 (15.1)	38 (9.7)	390 (100.0)

Conclusion

This paper summarises much of the information which would be required by the interested reader who is anxious to generate his/her own QALY computations. Some aspects of QALY applications (particularly ethical/philosophical questions) have not been dealt with here. These are discussed more fully in Gudex (1986) and in many of Williams' papers Williams (1985) (1986). The derivation of the Rosser descriptions and their associated valuations cannot be the last word on the subject. Indeed it is highly desirable that a set of weights that reflect the preferences of the community, are collected from a large, random sample. The weights which were generated by the 70 subjects in Rosser's original work are a single set which were never designed or portrayed as being representative of society as a whole. For those who consider that other weights are more appropriate then there should be no hesitation in reworking the valuation process and substituting new weights for the original values. In fact there would be much to be gained from exploring the sensitivity of results to the use of alternative sets of valuations.

Finally, the methods and instrumentation for measuring QoL, and hence deriving QALYs, are at a relatively early stage in their development. The very considerable interest generated by the application of the QALY approach reflects the importance that is attached to QoL information in measuring outcome from health care and should ensure a continuing stream of new research initiatives and practical applications. In the current economic climate, such information on outcome can, and should, play a major part in determining priorities for NHS funds. Hopefully this QALY toolkit will assist that process.

Appendix 1: Valuations from 6 Subject Groups
(see Kind, Rosser and Williams, 1982)

Medical Patients

	Distress			
Disability	A	B	C	D
I	1.000	0.992	0.986	0.977
II	0.987	0.982	0.968	0.936
III	0.980	0.966	0.958	0.915
IV	0.954	0.951	0.937	0.893
V	0.924	0.910	0.903	0.840
VI	0.863	0.848	0.760	0.440
VII	0.640	0.371	0.000	-1.480
VIII	-0.422	-	-	-

Psychiatric Patients

	Distress			
Disability	A	B	C	D
I	1.000	0.999	0.995	0.989
II	0.995	0.994	0.990	0.971
III	0.991	0.990	0.986	0.946
IV	0.985	0.982	0.976	0.935
V	0.972	0.963	0.964	0.836
VI	0.909	0.893	0.775	-0.500
VII	0.675	0.679	0.000	-1.443
VIII	-1.571	-	-	-

Medical Nurses

	Distress			
Disability	A	B	C	D
I	1.000	0.995	0.989	0.973
II	0.992	0.989	0.982	0.953
III	0.980	0.978	0.972	0.941
IV	0.975	0.972	0.963	0.911
V	0.956	0.949	0.879	0.739
VI	0.890	0.876	0.724	0.496
VII	0.621	0.583	0.000	-1.048
VIII	-1.258	-	-	-

Psychiatric Nurses

	Distress			
Disability	A	B	C	D
I	1.000	0.997	0.994	0.977
II	0.994	0.992	0.981	0.932
III	0.986	0.982	0.977	0.865
IV	0.977	0.974	0.970	0.855
V	0.965	0.956	0.953	0.835
VI	0.916	0.828	0.775	0.340
VII	0.577	0.450	0.000	-1.926
VIII	-0.217	-	-	-

Health Volunteers

	Distress			
Disability	A	B	C	D
I	1.000	0.994	0.989	0.944
II	0.989	0.986	0.973	0.937
III	0.983	0.979	0.953	0.913
IV	0.975	0.957	0.939	0.882
V	0.961	0.945	0.873	0.390
VI	0.851	0.817	0.657	-0.624
VII	0.733	0.716	0.000	-2.291
VIII	-0.326	-	-	-

Doctors

	Distress			
Disability	A	B	C	D
I	1.000	0.992	0.946	0.793
II	0.981	0.973	0.865	0.766
III	0.946	0.913	0.848	0.668
IV	0.923	0.888	0.760	0.187
V	0.873	0.865	0.692	-0.394
VI	0.800	0.773	0.298	-0.803
VII	0.505	0.452	0.000	-2.288
VIII	-1.077	-	-	-

SELF-COMPLETED QUESTIONNAIRE

GENERAL MOBILITY

Which one of these statements best describes your situation?

I can move around indoors and outdoors on my own easily with no aids or help. ☐

I can move around indoors and outdoors on my own with a little difficulty but with no aids or help. ☐

I can get about indoors and outdoors on my own but I have to use a walking aid e.g. stick, frame, crutch, wheelchair, etc. ☐

I can move around the house without anyone's help but I need someone's help to get outdoors ☐

I spend nearly all my time confined to a chair (other than a wheelchair). ☐

I have to spend nearly all my time in bed. ☐

SELF-CARE

Do you have difficulty with any of the activities listed below? If you do, do you also need help from someone else to do them?

	NO DIFFICULTY AT ALL	SOME DIFFICULTY BUT COPE ON MY OWN	SUCH DIFFICULTY THAT I NEED SOMEONE'S HELP
Washing yourself	☐	☐	☐
Dressing yourself	☐	☐	☐
Eating or drinking	☐	☐	☐
Using the toilet	☐	☐	☐

USUAL ACTIVITY

During the last two weeks has your health affected any of the things you usually do (e.g. at work or study, at home)?

Not at all ☐

Slightly affected ☐

Severely affected ☐

Unable to do usual activities at all ☐

SOCIAL AND PERSONAL RELATIONSHIPS

Does your state of health seriously affect any of the following?

Your social life?	Yes ☐	No ☐
Seeing friends or relatives?	Yes ☐	No ☐
Your hobbies or leisure activities?	Yes ☐	No ☐
Your sex life?	Yes ☐	No ☐

FEELINGS

Over the last two weeks has your state of health led you to experience any of these feelings? If so, how much distress have they caused you? Mark a cross on the line.

	No	Yes	NO DISTRESS AT ALL	EXTREME DISTRESS
Feeling sad or depressed	☐	☐		
Feeling anxious or worried	☐	☐		
Pain	☐	☐		
Dissatisfaction with your weight	☐	☐		
Dissatisfaction with your appearance	☐	☐		
Embarrassment	☐	☐		
Uncertainty about the future	☐	☐		
Anger or resentment	☐	☐		
Guilt	☐	☐		
Loneliness	☐	☐		
Loss of self-confidence	☐	☐		
Feeling dependent on other people	☐	☐		
Feeling dependent on machine for my health	☐	☐		
Feeling sick	☐	☐		
Breathlessness	☐	☐		
Difficulty sleeping	☐	☐		
Lack of energy	☐	☐		
Incontinence (i.e. lack of control over bladder or bowel movements)	☐	☐		

	No	Yes	NO DISTRESS AT ALL	EXTREME DISTRESS
Inability to concentrate	☐	☐		
Poor memory	☐	☐		
Difficulty in speaking	☐	☐		
Difficulty in hearing	☐	☐		
Difficulty in writing	☐	☐		
Difficulty in seeing	☐	☐		
Any other problems that cause you distress?	☐	☐		

Please specify

How much does your state of health distress you overall? Mark a cross on the line.

NO DISTRESS AT ALL | EXTREME DISTRESS

What aspect of your state of health most upsets you?

Appendix 3: Bibliography

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