EuroQol Working Paper Series

Number 17003
October 2017

ORIGINAL RESEARCH

The "power" of eliciting EQ-5D-5L values: the experimental design of the EQ-VT

Mark Oppe[1]
Ben van Hout[2]

[1] EuroQol Research Foundation, Rotterdam, the Netherlands
[2] University of Sheffield, Sheffield, UK

www.euroqol.org

Abstract

This paper describes the considerations and algorithms that were used to create the experimental designs for the valuation of EQ-5D-5L. The paper follows the iterative process, via a set of pilot studies, that lead to the experimental design of the EQ-VT (EuroQol Valuation Technology), the standardised valuation protocol for the EQ-5D-5L. First, the choices, considerations and algorithms used for the selection of health states for the pilot studies are described. This is followed by the subsequent choices considerations and algorithms for the design of the EQ-VT, which built on the results of the pilot studies. The EQ-VT design includes 86 EQ-5D-5L states for the composite TTO task divided over 10 blocks of 10 health states and 196 pairs of EQ-5D-5L health states for the DCE task divided over 28 blocks of 7 pairs. The required sample size was found to be 1000 respondents.
Given the results of the valuation studies that used the EQ-VT, there may still be better designs, but we are quite sure that there are a lot more worse designs.

Keywords

EQ-5D-5L, valuation, experimental design, EQ-VT, sample size

Acknowledgements

All steps in the process to develop the experimental designs for the TTO and DCE were reviewed prior to implementation by the management team of the multinational pilot programme. The team consisted of Frank de Charro, Nancy Devlin and Paul Krabbe in addition to the two authors.

Mark Oppe
EuroQol Research Foundation
Marten Meesweg 107
3068 AV Rotterdam
E: oppe@euroqol.org

***Disclaimer**:* The views expressed are those of the individual author and do not necessarily reflect the views of the EuroQol Group.

Introduction

While now, in 2017, the first studies concerning the valuation of the 5 level version of the EQ-5D have been published, one may search, to no avail, what the process has been that has led to the precise design of those studies. It would have been wonderful if this would have been established on the basis of objective criteria which are easily reproducible, and that it would have been published many years ago. It is not. Alongside developing the design, new elicitation methods were being tested and the deadline for starting the first official evaluation study was coming nearer and nearer. Shortcuts were taken and some arbitrary choices were made. Now more and more studies are underway and the need for a formal clarification of the underlying choices is felt necessary.

The current valuation protocol was preceded by a number of pilot studies and it builds upon the results of those. Similarly, the current design was preceded by those concerning the pilot studies and similarly it builds upon those. This all happened after that the decision had been taken that data would be collected using two methods: time trade off (TTO) and discrete choice experiments (DCE). This decision, by the way, was taken by the executive committee of the EuroQol group, a chosen group of board members (the executive committee) which were advised by a so called “valuation task force”. It was not without uncertainty that this decision was taken and it needs to be noted that some of those decisions may have some arbitrary character. Is TTO “better” than DCE? Is DCE “better”? Can we do DCE-with duration? What constitutes “better”?

Another question was “can we combine the results”. The idea was yes we can, using what was named the hybrid method, maximizing the product of the respective likelihood functions resulting into a weighted average of both the DCE and TTO results. Naturally, these will always be different. What is right and what is wrong depends on ones trust in the underlying assumptions. Opinions about how to do this were divided but the decision to design the main study on the numbers of the TTO data reflects that most were leaning towards TTO.

When considering the concept of the “power” of the studies, one may want to realize that in this case there are no hypotheses being tested. The MVH study – using TTO - asked 3235 respondents to value 13 per person out of selection of 43 [1]. The numbers of 3235 was based on the calculation that this would enable the detection of a .05 difference between health states at a .05 level of significance. The Dutch 3-level valuation study asked 300 respondents to value a selection of 17 health states each and the latest 3-level study, based on an updated MVH protocol as used in France included 450 respondents, each valuing 17 health states out of selection of 27 health states [2].

Within the thoughts about the current design, the central aim was to estimate a value function and not as much the value for individual health states. So, it wasn’t as much about the confidence intervals of the individual health states, but about the confidence intervals surrounding the model parameters. Naturally, more data leads to smaller confidence intervals, but there is no formal threshold for the width of those. Experience with the 3 level system thought that a model with 11 parameters was already quite flexible. Here the expectation was that a linear model with 21 parameters, a constant term and 20 dummy variables for each deviation from perfect health would be a good starting point.

Now, about 8 years later, we realize that with hindsight we would or should have done things differently. It is with this hindsight that an attempt is presented to document the choices that have been made and to inform about the considerations underlying these.

Experimental design for the multinational pilot studies

Choices and considerations

The final design has been the result of an iterative study set up. This started with the core pilot study in 4 countries with 400 individuals per country, 100 TTO states with a 10-5 lead-time and 200 DCE pairs [3]. This was followed by studies in 4 subsequent countries analysing lead time versus lag time, different lead times, a version with DCE with death, and a version with changes in the presentation of lead time TTO. Dissatisfied with the results, an internet study in 5,000 individuals was started using best worst scaling, DCE, two variants of lead time TTO, two variants of lag time TTO, and the classic TTO [3].

The results guided towards a last pilot study in which the lead time was only used in those health states which were considered worse than dead (i.e. composite TTO) [4].

In all studies a number of choices have to be made. The first is how to do the interviews. Considered were using the internet, grouped interviews and individual interviews. Using university people as interviewers who are familiar with the questions was considered or using people from external agencies. This, as well as all decisions about the use of computers, is outside the scope of this article. Here we concentrate on the following questions. How many respondents do we need, how many and which health states do we need and how many questions per individual do we need.

Within the core pilot study, numbers were dictated by feasibility. The project leaders agreed that 400 respondents per country would be feasible. The Dutch study used 17 TTO questions per respondent and experience learned that this was stretching the acceptable burden for many respondents. So, it was chosen to do 5 TTO's per individual and 10 DCE's. There was no real theory about this division, as – at that moment – it was expected that one TTO would give more information than one DCE and as such one would need more DCE's than TTO's.

When choosing the number of 100 states for the TTO it was considered that a main effects model would have 21 parameters (5*4 dummy variables + intercept) leaving 79 degrees of freedom. The number also allows for random coefficient models, and – in theory – for capturing all kinds of interactions and or the effects of background variables. When offering the health states to each individual, it was assumed that some spread over the spectrum from good to bad needed to be offered and it was chosen to block the design into 20 blocks of 5 TTO's and 10 DCE's.

During the planning of the core pilot study, theory about the choice of health states for the TTO study was found in the literature about Fedorov-designs [5]. Theory about the choice of health states for the DCE study was found in the literature about Bayesian efficient designs [6-8].

Selection of states for the TTO task

The algorithm to select the 100 TTO states from a Fedorov design demands a candidate set of states to choose from (e.g. a full factorial design) and the characteristics of the questionnaire with respect to number of dimensions and levels. Here we excluded extreme combinations from the candidate set of states, extreme being defined as a combination of a level 1 and a level 5 on the 1st 4 dimensions (this left 2155 states in the candidate set). The AlgDesign package [9] in R was used to generate the Fedorov design and the blocking.

Selection of pairs for the DC task

We used a Bayesian efficient design algorithm to select the pairs for the DCE. The priors were based on the results of main effects model (without intercept) estimated on the data of an EQ-5D-3L DCE study [10]. We assumed that the levels 1, 2 and 3 from the EQ-5D-3L study corresponded to the levels 1, 3 and 5 for the EQ-5D-5L, while the levels 2 and 4 were assumed to be the mid-points between the levels 1, 3 and 5. The standard errors of the parameters of the model we estimated on the EQ-5D-3L DCE data varied between 0.06 and 0.08. To be on the safe side, we increased these to 0.10 for our priors. The priors that were used can be found in table 1.

Table 1: Priors used for the DCE design

	Level 2	Level 3	Level 4	Level 5
Mobility	-0.122	-0.245	-0.892	-1.539
Self Care	-0.285	-0.570	-0.895	-1.220
Usual Activity	-0.153	-0.305	-0.670	-1.035
Pain / Discomfort	-0.104	-0.208	-0.853	-1.499
Anxiety / Depression	-0.250	-0.500	-1.054	-1.609

The Bayesian efficient design algorithm was implemented in R, and the blocking algorithm from the AlgDesign package [9] was used to divide the 200 pairs over the 20 blocks.

An overview of the most important characteristics of the design for the core pilot studies can be found in table 2. The full set of EQ-5D-5L states for the TTO and pairs for the DCE can be found in Appendix B.

Table 2: Overview of the design specifications for the multinational core pilot study

TTO design specifications

Number of respondents	1600	(4 countries*400 respondents)
Number of blocks	20	
Number of states	100	
Number of states per respondent	5	
Number of observations per state	80	

DCE design specifications

Number of respondents	1600	(4 countries*400 respondents)
Number of blocks	20	
Number of pairs	200	
Number of pairs per respondent	10	
Number of observations per pair	80	

Experimental design for the EQ-VT

Choices and considerations

Although the core study and the other pilot studies taught us many valuable lessons, the information about the selection of states as well as the number of states was limited. It was observed that the Fedorov design resulted in poor level balance with respect to the level 3's of the first 4 dimensions, and the levels 2 and 4 for anxiety/depression. No reason was found to object to the way the DCE design was established.

The aim of the designs is to establish value sets for the EQ-5D-5L in different countries. Without any threshold of what is an acceptable range of uncertainty, one may simply realise that the larger the number of observations the smaller the standard errors around the model parameters. Having no such threshold implies that there is no optimal number of observations and also without any null hypothesis the concept of power is ill defined. Therefore in order to obtain a rough estimate for the number of observations required per state, we focused on obtaining a reasonable level of precision based on the average standard error across the utility spectrum guided by former studies.

The EQ-5D-5L pilot studies which included 4000 DCE observations per country resulted in DCE models that had face validity. At the extremes of all the TTO studies for the EQ-5D-3L we found the Dutch study with 5066 observations and the MVH study with around 39000 observations. In all cases value sets were successfully derived. Relatively arbitrary, keeping in mind that the aim was to able to create separate models for TTO and DCE it was chosen to include 10 TTO's and 7 DCE's per respondent. Within this distribution it was considered that the required number of observations per pair in DCE can be lower than the required number of observations per state in TTO because of the nature of the data: the SD of a choice probability (i.e. the within pair variance) is smaller than SD of a TTO state (i.e. within state variance). This allows for a greater number of pairs to be included in the

DC task for the same number of respondents. The core pilot study showed that accurate models could be estimated on a 200 pair design with between 15 and 42 observations per pair [11]. Therefore, it was decided to set the required number of observations per pair to 36. Within this it was taken into account that adding more TTO's or DCE's would increase interview time above a level considered to be feasible (45 mins).

In considerations about the number of observations per TTO state, an argument was found in the fact that in the composite TTO pilot study with 121 observations per state, the standard errors for the severe states were around 0.056, while those for the mild states were around 0.01. This suggests we would achieve adequate average precision of the mean values with 100 observations per TTO state. The fact that you may want more observations surrounding severe states due to higher SE's was neglected.

Selection of states for the TTO task

In order to counteract framing effects, a blocked design was chosen to achieve a balanced mix of states with respect to utility. Therefore each block was designed to include 1 of the 5 very mild states (i.e. misery index 6) and the pits (i.e. misery index 25). It was chosen to include 10 blocks with 2 fixed states in each block such that 8 states per block would need to be generated. This implied that we would have (10*8+5+1=) 86 states in total, which is still more than 4 times the number of parameters for a main effects model.

We selected the 80 states from the total set of 3119 (i.e. 3125-6) using Monte Carlo simulation. First a sample of n = 1000 respondents was simulated using a simulation programme implemented in R. Details of the simulation programme can be found in [12]. Next a random design of 80 states was generated. We attached values for the states to the simulated sample of respondents using a set of priors for the 20 main effects (the constant was omitted). An OLS main effects regression model (without constant) was estimated on the simulated set of TTO data comprising the 80 states and 1000 respondents. Next, the sum of the mean squared errors (MSE) was calculated between the parameters that were used to create the preference data and the parameters resulting from the OLS model. The difference between perfect level balance and achieved level balance of the 80 generated states was also calculated. The construction of the level balance criterion can be found in appendix A. The regression procedure was repeated 10,000 times and an iterative procedure was used that designs that had either worse level balance or worse MSE were discarded.

The "optimal" 80 states were divided over the 10 blocks using the blocking algorithm included in the "AlgDesign" package in R. The blocking algorithm divides the states over the blocks in such a way that the within block variance is maximised (i.e. the full utility range is more or less covered within a block), while the between block variance is minimised (i.e. all blocks are more or less the same with respect to the mean utility per block).

In summary the design of the TTO experiment consists of 86 states divided over 10 blocks with 100 observations per block, leading to about 10,000 observations in total, where the 5 very mild states and state 55555 were oversampled compared to the other 80 states. For a main effects model this means that there will be at least 400 observations per model parameter (8000 observations / 20 parameters). The total sample size was determined to be 1000 (i.e., 10 blocks * 100 observations per block)

Selection of pairs for the DC task

Since the core pilot study showed that the experimental design of the DC task in that study allowed for accurate modelling of EQ-5D-5L utilities [11], it was decided to follow the design parameters of that DC task as close as possible in the EQ-VT.

As the between pair variance in DC is higher than the between state variance in TTO, we preferred a DCE design with more pairs than states in the TTO design. Given the decided upon sample size of 1000, 36 observations per pair and 7 pairs per respondent, the blocked design comprised 28 blocks of 7 pairs (28*7=196 pairs in total).

In addition to the considerations described above, we wanted to make sure that 10 very mild pairs would be included in the DC design. Therefore we fixed these 10, and generated the remaining 186 ones using a design algorithm. We used the 200 pair DCE design from the core pilot study for the selection of the 186 pairs of the DCE design for EQ-VT. A subset of 186 pairs was drawn from the full set of 200 pairs, and the D-error of the sub-sample was calculated. This process was repeated 10,000 times and the design with the lowest D-error was kept as the DCE design for the EQ-VT. The 196 pairs (10 fixed + 186 generated) were divided over the 28 blocks using the same blocking algorithm that was used for the TTO.

An overview of the most important characteristics of the design for the EQ-VT can be found in table 3. The full set of EQ-5D-5L states for the composite TTO and pairs for the DCE can be found in Appendix C.

Table 3: Overview of the design specifications for the EQ-VT

TTO design specifications

Number of respondents	1000	
Number of blocks	10	
Number of states	80	+ 6 fixed states
Number of states per respondent	10	
Number of observations per state	100	(for the set of 80 states)
N obs 21111	200	
N obs 12111	200	
N obs 11211	200	
N obs 11121	200	
N obs 11112	200	
N obs 55555	1000	

DCE design specifications

Number of respondents	1000	
Number of blocks	28	
Number of pairs	186	+ 10 fixed very mild pairs
Number of pairs per respondent	7	
Number of observations per pair	36	(for the total set of 196 pairs)
10 fixed very mild pairs	21111 – 12121	
	12111 – 21121	
	11211 – 22111	
	11121 – 21211	
	11112 – 12221	
	11122 – 23111	
	11212 – 22112	
	12112 – 22211	
	21112 – 12211	
	11221 – 22122	

Discussion

The advantage of writing a design paper after multiple studies have obtained results using these designs is that unexpected weaknesses could be detected. One of those might be that in the 20 parameter models coefficients may have inconsistencies, for example the coefficient for level 4 might be higher than for 5 for the same dimension. When observed in isolation it has been suggested that this might due to the design. However, different countries showed such inconsistencies some in TTO some in DCE, for different dimensions and no clear pattern of such inconsistencies has been observed so far across countries. Naturally we may need to consider that different countries use different languages and, for example, the difference between severe and extreme (or slight and moderate) may be different for each language. Also the weight given to the various dimensions may affect the discriminative power between levels. As such these inconsistencies haven't given us any guidance to improve our design, which may be a good thing.

In the design we have neglected to take the expected heteroscedasticity into account by varying the number of observations per health state between mild and severe states. One may suggest that rather than using an equal number of observations per state (or pair) one could use equal standard errors around the states (or pairs). One may suggest research assessing the impact of decreasing the number of observations for mild health states using currently available data.

While in the core pilot study we removed a number of extreme health states (i.e. combinations of a level 1 and a level 5 on the 1st 4 dimensions) from the candidate set, we did not do this in the design for the EQ-VT. There is a question of the trade-off between statistical efficiency and potential errors in judgements by respondents due to the fact that the states are difficult to imagine. Recently 2 studies were conducted that showed that A) these hard to imagine states in fact do exist, they are rare not unrealistic [13]. And B) excluding these from the design is likely to result in serious misspecification of the model [14].

Naturally the designs reported in this paper also have limitations. The fact that the published studies have not reported any significant interactions could be due to the fact that the designs were optimised for main effects only. Also, none of the N3 like terms (e.g. N45) were found to offer any additional explanatory value. Here one may note that the designs for the 3L valuation studies also were not optimised to find interactions, but in many studies the N3 term did add to the explanatory power. Additionally, the design wasn't optimised for finding different functional forms in different (groups of) people. This may especially be relevant concerning values below and above death [15]. Although this has been taken into account rather informally by including one of the 5 mildest states and 55555 in each block of the TTO.

The designs for both TTO and DCE were established independently, while in the hybrid models it implicitly assumed that the relative weights for the dimensions and the interpretation of the levels in each dimension are the same. As such, an integrated design optimised for the hybrid model may be more efficient than the separate designs. However this might result in suboptimal designs for estimating TTO only models, which was considered unacceptable. One way to use a "hybrid" design that does not have this issue, is to first create a TTO design and then using a hybrid design select the DCE pairs that best complement the TTO design.

There were differences in the criteria to optimise in the design algorithms used to create the TTO design and the DCE design for the EQ-VT. The TTO used the sum of MSE’s and level balance as optimisation criteria, while the DCE used Bayesian efficient design based on D-error. This could be harmonised by changing the sum of MSE’s to a Bayesian efficient design using D-error for the TTO and by adding the level balance to the DCE algorithm. The level balance criterion has been added to the algorithm in a number of studies recently started, in order to create an efficient sub-design of the 196 pairs.

In conclusion, given the results of the EQ-VT studies, there may still be better designs, but we are quite sure that there are a lot more worse designs.

References

1. Dolan P. Modeling valuations for EuroQol health states. Med Care. 1997;35(11):1095-108.
2. Lamers LM, McDonnell J, Stalmeier PF, Krabbe PF, Busschbach JJ. The Dutch tariff: results and arguments for an effective design for national EQ-5D valuation studies. Health Econ. 2006;15(10):1121-32.
3. Oppe M, Devlin NJ, van Hout B, Krabbe PF, de Charro F. A program of methodological research to arrive at the new international EQ-5D-5L valuation protocol. Value Health. 2014;17(4):445-53.
4. Janssen BM, Oppe M, Versteegh MM, Stolk EA. Introducing the composite time trade-off: a test of feasibility and face validity. Eur J Health Econ. 2013 Jul;14 Suppl 1:S5-13.
5. Fedorov V. Theory of Optimal Experiments. New York: Academic Press; 1972.
6. Sandor Z, Wedel M. Designing Conjoint Choice Experiments Using Managers' Prior Beliefs. Journal of Marketing Research. 2001;38:430-444.
7. Bliemer MCJ, Rose JM and Hess S. Approximation of Bayesian efficiency in experimental choice designs. Journal of Choice Modelling. 2008;1(1):98-126.
8. Rose JM, Scarpa R, Bliemer MCJ. Incorporating model uncertainty into the generation of efficient stated choice experiments: A model averaging approach. ITLS working paper. 2009: ITLS-WG-09-08.
9. Wheeler RE. AlgDesign: Algorithmic Experimental Design. The R project for statistical computing 2004. https://CRAN.R-project.org/package=AlgDesign.
10. Stolk EA, Oppe M, Scalone L, Krabbe PF. Discrete Choice Modeling for the Quantification of Health States: The Case of the EQ-5D. Value Health. 2010;13(8):1005-13.
11. Krabbe PF, Devlin NJ, Stolk EA, Shah KK, Oppe M, van Hout B, Quik EH, Pickard AS, Xie F. Multinational evidence of the applicability and robustness of discrete choice modeling for deriving EQ-5D-5L health-state values. Med Care. 2014;52(11):935-43.
12. Oppe M, v Hout B. The optimal hybrid: Experimental design and modelling of a combination of TTO and DCE. In: Proceedings of the 27th Plenary Meeting of the EuroQol Group. 2010. Athens, Greece.
13. Bonsel GJ, Oppe M, Janssen MF. Unlikely health states: Evidence from healthy and diseased populations. Paper presented at the 32st plenary meeting of the EuroQol Group. 2015 Krakow Poland.
14. Bonsel GJ, Oppe M, Janssen MF. Unexpected large misspecification effects of health profile selection and interaction analysis to obtain a value function from unsaturated valuation datasets, using the standard EuroQol approach. Paper presented at the 31st plenary meeting of the EuroQol Group. 2014. Stockholm Sweden.
15. Macran S, Kind P. "Death" and the valuation of health-related quality of life. Med Care. 2001;39(3):217-27.

Appendix A: Construction for level balance optimisation criterion

Step 1: A matrix (labelled "EQ lvl mat") with the counts for each level-domain combination is constructed (note that the example tables below contain hypothetical data using 10 EQ-5D-5L states for illustrative purposes):

	MO	SC	UA	PD	AD
lvl 1	2	2	1	3	1
lvl 2	1	2	2	2	3
lvl 3	3	2	2	1	2
lvl 4	2	2	3	1	1
lvl 5	2	2	2	3	3

Step 2: Using the data from "EQ lvl mat" a second matrix, containing the squares of the differences between the presence of levels per dimension is created (labelled "lvl dist mat"):

	MO	SC	UA	PD	AD
(lvl 1 - lvl 2)^2	1	0	1	1	4
(lvl 1 - lvl 3)^2	1	0	1	4	1
(lvl 1 - lvl 4)^2	0	0	4	4	0
(lvl 1 - lvl 5)^2	0	0	1	0	4
(lvl 2 - lvl 3)^2	4	0	0	1	1
(lvl 2 - lvl 4)^2	1	0	1	1	4
(lvl 2 - lvl 5)^2	1	0	0	1	0
(lvl 3 - lvl 4)^2	1	0	1	0	1
(lvl 3 - lvl 5)^2	1	0	0	4	1
(lvl 4 - lvl 5)^2	0	0	1	4	4

Step 3: The elements of "lvl dist mat" are summed and the square root is taken over the sum to obtain the optimisation parameter (labelled "lvl bal check"):

"lvl bal check" = sqrt (sum (lvl dist mat)) = 7.75

A value for "lvl bal check" = 0 indicates perfect level balance (i.e. each level-domain combination occurs twice)

A value for "lvl bal check" = 44.72 indicates the worst possible level balance: for each domain only 1 level is included. In this case "EQ lvl mat" contains one 10 and four 0's for each domain; "lvl dist mat" contains four 100's and 6 0's, and the sum of "lvl dist mat" = 2000, with a sqrt = 44.72.

Note that perfect level balance is not a requirement (and might actually be undesirable in some cases). Small deviations can be allowed by e.g. setting a maximum allowable value for "lvl bal check" and letting the algorithm sample designs until it finds one for which "lvl bal check" is lower than this pre-set maximum.

Appendix B1: The 100 EQ-5D-5L health states included in the TTO task of the core pilot study

Block	MO	SC	UA	PD	AD
1	1	4	4	1	1
1	4	1	4	4	1
1	4	1	1	1	3
1	5	5	5	2	5
1	2	2	5	5	5
2	4	4	1	1	1
2	1	1	1	4	1
2	2	5	5	4	1
2	5	5	2	5	3
2	3	3	3	2	5
3	3	1	1	4	1
3	1	3	4	4	1
3	5	5	4	4	3
3	1	4	1	1	5
3	4	1	4	1	5
4	2	5	5	2	1
4	5	5	2	5	1
4	2	1	1	1	3
4	5	2	5	2	5
4	1	4	4	4	5
5	3	1	4	1	1
5	4	4	1	4	1
5	1	4	1	1	3
5	5	2	2	2	5
5	1	1	1	4	5
6	1	1	4	1	1
6	5	5	5	5	1
6	5	2	2	2	3
6	2	5	5	2	5
6	2	2	2	5	5
7	1	1	4	4	1
7	5	3	2	5	1
7	5	2	5	2	3
7	4	1	1	4	5
7	2	5	4	5	5
8	1	2	1	2	1
8	4	5	5	3	1
8	5	2	2	5	1
8	2	2	5	5	3
8	2	5	2	5	5
9	2	5	2	2	1
9	5	2	5	2	1
9	2	2	2	5	1
9	1	1	2	1	5
9	2	5	5	5	5
10	1	4	1	4	1
10	5	4	5	5	1
10	4	1	3	4	3
10	4	4	1	1	4
10	1	1	4	1	5

block	MO	SC	UA	PD	AD
11	4	1	4	1	1
11	3	3	3	3	3
11	4	4	1	1	5
11	1	1	4	4	5
11	5	5	5	5	5
12	1	4	1	1	1
12	4	1	4	3	1
12	1	1	1	4	4
12	4	4	4	1	5
12	5	5	2	5	5
13	1	1	1	1	1
13	2	5	5	5	1
13	4	4	1	4	4
13	1	4	4	1	5
13	4	1	4	4	5
14	3	3	2	1	1
14	5	2	5	5	1
14	2	5	5	2	3
14	5	5	2	2	5
14	1	1	4	3	5
15	4	4	4	1	1
15	1	1	4	3	1
15	1	4	1	4	3
15	4	1	1	1	5
15	4	5	5	5	5
16	5	5	2	2	1
16	2	2	5	5	1
16	1	4	4	1	3
16	3	1	4	1	5
16	1	4	1	4	5
17	5	5	5	2	1
17	4	1	1	4	1
17	1	1	4	1	3
17	3	3	3	3	5
17	5	2	5	5	5
18	4	1	1	1	1
18	2	2	3	5	3
18	2	5	2	2	5
18	2	2	5	2	5
18	5	2	2	5	5
19	5	2	2	2	1
19	2	5	3	5	1
19	5	5	5	2	4
19	5	2	5	5	4
19	4	4	1	4	5
20	2	2	5	2	1
20	2	5	2	5	1
20	5	5	2	2	2
20	1	1	1	1	5
20	5	2	3	5	5

Appendix B2: The 200 pairs of EQ-5D-5L health states included in the DC task of the core pilot study

block	MO	SC	UA	PD	AD	MO	SC	UA	PD	AD
1	4	3	3	3	2	2	5	2	5	1
1	1	2	2	2	5	5	2	4	4	2
1	3	1	1	5	3	1	2	2	3	5
1	4	1	4	4	2	3	3	1	3	4
1	4	4	5	2	2	4	4	4	2	3
1	2	5	1	1	2	3	4	5	2	2
1	2	5	5	2	3	4	2	5	5	5
1	4	1	5	5	4	3	2	3	1	3
1	4	4	1	3	3	5	5	1	1	5
1	3	4	3	4	4	1	1	4	5	1
2	1	1	3	5	2	1	2	1	4	5
2	5	3	2	1	2	5	2	1	4	3
2	1	5	4	1	5	5	4	3	2	3
2	4	5	3	3	2	1	1	4	4	2
2	2	2	4	4	1	5	5	3	3	1
2	5	4	3	3	4	1	4	5	4	2
2	3	5	2	5	1	4	3	5	5	4
2	1	1	4	2	4	1	4	5	1	3
2	5	3	5	1	5	2	3	2	4	4
2	3	2	1	4	5	5	1	2	2	3
3	5	1	1	3	2	1	2	1	1	4
3	2	1	3	4	3	4	4	2	5	2
3	1	3	5	5	1	4	1	1	5	3
3	2	4	4	4	5	5	4	5	4	3
3	5	5	2	5	4	2	5	4	3	4
3	4	3	1	3	3	1	3	5	2	5
3	4	5	2	1	2	2	4	2	2	3
3	3	1	5	1	4	5	5	4	4	1
3	2	5	2	2	5	3	1	5	2	1
3	3	2	3	1	1	3	3	1	3	5
4	5	1	1	5	3	4	3	3	5	2
4	3	2	2	3	2	1	4	4	3	5
4	3	3	4	2	1	2	3	4	1	2
4	3	3	1	2	4	2	4	3	4	1
4	4	3	4	3	2	2	5	3	4	1
4	4	3	5	1	5	5	4	2	2	2
4	2	4	2	1	3	2	3	5	4	5
4	3	3	2	4	4	4	3	1	1	5
4	3	3	4	5	4	4	1	5	5	2
4	1	5	4	5	3	3	1	3	1	5
5	5	2	1	4	2	1	3	5	3	5
5	1	1	3	2	3	5	5	1	4	5
5	3	2	5	3	5	5	5	3	2	2
5	5	4	1	2	4	3	2	5	4	3
5	1	5	3	5	4	3	2	1	5	2
5	5	2	2	3	4	4	2	3	5	1
5	4	5	4	1	3	1	2	3	3	5
5	2	4	3	3	3	3	4	4	1	3
5	2	4	3	5	2	3	4	2	1	1
5	2	3	4	2	1	2	1	3	2	2

block	MO	SC	UA	PD	AD	MO	SC	UA	PD	AD
6	2	4	2	5	5	3	1	3	1	1
6	5	4	4	4	1	4	2	2	4	3
6	5	3	3	4	5	1	4	2	2	3
6	5	3	4	4	1	2	4	5	5	4
6	1	5	1	1	5	3	3	1	1	1
6	3	3	2	2	2	4	5	5	3	1
6	2	2	5	1	1	4	3	1	3	2
6	1	1	2	5	4	1	2	3	4	4
6	5	4	2	5	4	5	1	5	3	5
6	2	2	5	1	3	5	5	4	4	5
7	2	5	5	1	4	3	1	4	2	4
7	1	2	5	1	2	3	1	2	3	2
7	2	3	2	5	3	3	4	4	4	4
7	4	4	2	2	2	3	5	4	1	3
7	3	3	1	5	1	1	5	3	5	3
7	4	2	3	1	5	5	5	5	5	1
7	3	4	2	2	3	1	1	1	3	3
7	4	3	4	5	5	5	5	3	4	4
7	1	1	5	5	2	5	3	2	3	1
7	5	3	2	3	2	2	1	3	1	5
8	1	2	4	3	1	5	1	4	2	2
8	1	3	2	4	2	3	1	1	2	4
8	1	3	5	1	5	2	5	3	2	5
8	5	4	2	4	2	2	2	2	3	4
8	5	2	4	1	3	1	5	1	3	2
8	3	5	2	2	2	5	3	3	3	2
8	3	2	2	5	5	5	4	5	5	4
8	4	1	3	3	2	1	4	2	1	2
8	5	4	1	1	5	3	3	4	5	3
8	2	3	5	5	3	3	2	5	4	2
9	5	5	1	5	4	3	1	5	4	5
9	4	2	4	4	1	5	1	4	3	5
9	2	3	4	3	3	1	5	4	4	1
9	5	3	2	1	1	2	1	2	3	3
9	3	3	5	1	4	2	3	3	3	1
9	5	1	1	2	4	5	3	1	1	5
9	2	5	4	2	5	5	3	1	4	1
9	2	4	5	4	2	5	2	2	2	1
9	2	1	2	4	1	1	5	5	4	3
9	1	3	3	5	5	1	5	3	3	4
10	2	1	4	1	5	4	4	3	2	1
10	4	5	2	3	5	5	4	3	5	5
10	4	3	2	1	1	4	2	2	3	2
10	2	4	2	5	3	5	5	4	2	5
10	1	3	4	5	1	2	1	2	1	1
10	3	3	3	1	5	2	5	5	4	4
10	5	2	4	3	2	1	4	4	5	4
10	1	5	1	3	1	2	2	3	5	1
10	4	5	5	2	3	1	1	1	2	5
10	5	1	4	5	5	4	3	3	1	2

Appendix B2 cont.: The 200 pairs of EQ-5D-5L health states included in the DC task of the multinational pilot study

block	MO	SC	UA	PD	AD	MO	SC	UA	PD	AD
11	4	2	5	4	3	3	5	3	3	1
11	2	4	4	5	3	4	4	5	2	5
11	3	1	5	4	2	1	1	2	3	3
11	2	4	5	2	3	5	1	1	3	3
11	2	3	1	2	2	3	3	5	1	1
11	4	5	1	1	5	1	5	3	4	3
11	1	5	3	1	3	4	1	5	1	2
11	5	5	2	3	3	2	3	5	5	4
11	4	1	3	5	3	1	2	1	5	4
11	4	1	1	2	3	5	5	1	4	2
12	4	1	1	2	2	4	5	4	2	1
12	5	2	2	5	3	2	4	1	4	2
12	3	3	2	5	3	4	3	4	2	5
12	1	4	5	2	5	1	5	3	2	3
12	1	2	5	1	3	4	4	5	5	2
12	4	1	2	2	2	5	1	3	5	1
12	2	5	3	3	1	2	1	5	5	3
12	4	5	4	2	2	2	1	3	2	4
12	4	4	1	4	4	5	3	1	2	5
12	3	3	5	4	5	1	4	4	1	4
13	5	3	1	2	3	1	5	1	1	4
13	1	5	3	1	4	5	5	5	5	3
13	3	1	4	3	4	4	2	1	4	1
13	5	4	5	5	1	2	3	3	5	4
13	4	2	3	5	2	3	4	5	3	3
13	1	4	3	4	5	2	2	2	1	1
13	4	5	2	4	3	5	1	5	5	5
13	1	4	1	4	1	1	5	4	3	3
13	2	2	5	1	5	2	1	2	3	4
13	4	2	3	2	3	5	3	4	1	2
14	1	2	5	3	4	3	2	2	1	1
14	4	2	3	4	1	2	3	5	5	2
14	4	3	1	3	1	5	2	1	3	5
14	3	2	3	3	2	4	5	5	4	1
14	4	5	1	3	1	3	2	3	1	5
14	4	4	4	3	5	3	2	4	4	1
14	1	4	5	3	5	3	3	5	2	5
14	4	2	5	3	3	2	4	4	4	4
14	3	1	1	4	2	3	3	1	3	2
14	1	4	3	1	5	2	5	2	3	4
15	5	1	4	3	1	1	3	4	1	3
15	3	4	4	2	2	2	5	4	2	3
15	5	1	1	4	3	1	5	2	4	5
15	2	3	4	2	3	4	5	3	1	2
15	3	4	1	5	4	4	3	5	3	3
15	4	5	5	3	4	2	1	2	5	3
15	2	2	2	4	4	5	1	5	5	1
15	3	4	4	3	2	1	3	2	5	4
15	2	2	4	3	3	4	3	1	4	4
15	2	3	2	1	4	4	1	2	1	1

block	MO	SC	UA	PD	AD	MO	SC	UA	PD	AD
16	1	1	2	1	1	4	2	1	5	5
16	1	4	2	2	1	1	3	4	4	4
16	5	4	1	4	3	4	2	1	1	5
16	1	5	5	3	4	2	5	5	5	3
16	5	4	5	4	1	4	2	2	2	3
16	5	1	3	4	5	3	3	5	3	3
16	5	4	3	4	5	2	4	4	3	2
16	2	2	1	3	5	5	5	2	2	1
16	2	5	5	5	1	2	2	3	1	2
16	2	1	2	1	3	3	1	4	5	2
17	4	4	5	2	4	2	4	2	4	4
17	5	5	4	4	4	5	3	4	2	5
17	1	2	1	2	2	2	1	3	2	3
17	1	3	3	4	2	4	4	4	3	4
17	3	1	2	3	3	3	3	3	2	4
17	5	5	3	1	1	2	4	1	5	2
17	1	2	1	5	5	3	1	5	5	1
17	5	2	3	5	5	2	4	2	1	1
17	4	5	4	3	5	4	4	5	4	1
17	1	1	3	2	1	4	2	3	1	4
18	3	1	5	5	3	3	5	3	5	5
18	1	3	3	5	1	4	4	3	1	5
18	5	5	2	2	4	4	3	5	2	1
18	1	2	1	3	4	1	1	2	2	1
18	5	2	1	1	1	1	5	5	5	3
18	1	1	4	2	3	5	5	3	2	4
18	1	2	5	5	2	3	4	4	2	1
18	5	5	5	1	5	3	2	1	4	2
18	3	5	2	5	5	5	1	4	3	2
18	5	5	1	1	2	3	1	2	4	4
19	3	4	1	4	5	5	2	4	2	2
19	1	3	5	3	3	2	2	4	5	5
19	2	5	3	3	4	2	4	5	1	1
19	2	1	3	4	1	1	3	3	1	2
19	3	2	4	2	3	2	5	1	3	5
19	5	3	5	1	4	2	3	1	5	1
19	5	3	1	1	4	4	3	4	5	4
19	3	3	2	4	1	4	1	3	5	2
19	4	2	1	4	5	4	5	5	2	5
19	1	4	4	3	1	4	3	1	1	4
20	3	5	1	2	1	4	4	1	4	5
20	3	2	1	2	4	2	1	4	3	4
20	2	4	5	4	4	3	5	3	3	4
20	4	5	1	3	5	3	1	2	1	3
20	2	5	4	5	4	5	3	2	1	4
20	2	1	4	1	3	1	2	2	4	1
20	5	3	4	3	3	4	4	5	5	4
20	4	2	4	4	2	3	1	5	3	1
20	2	1	3	1	4	4	4	3	3	2
20	2	2	4	5	1	1	5	4	2	1

Appendix C1: The 86 EQ-5D-5L health states included in the composite TTO task of the EQ-VT

block	MO	SC	UA	PD	AD
1	1	1	2	2	1
1	1	1	2	3	5
1	5	4	2	3	1
1	5	1	4	5	1
1	3	4	5	1	5
1	3	5	2	4	5
1	1	2	5	1	4
1	4	5	1	4	4
1	1	2	1	1	1
1	5	5	5	5	5
2	1	2	5	4	3
2	1	2	1	2	1
2	4	3	5	4	2
2	3	4	1	5	5
2	5	2	2	1	5
2	4	5	1	3	3
2	3	2	4	4	3
2	2	3	5	1	4
2	1	1	2	1	1
2	5	5	5	5	5
3	4	5	2	3	3
3	5	5	2	3	3
3	3	1	5	2	5
3	5	2	4	5	5
3	1	2	2	4	4
3	1	3	3	1	3
3	2	5	1	2	2
3	1	1	4	2	1
3	2	1	1	1	1
3	5	5	5	5	5
4	2	1	1	1	2
4	1	4	5	5	4
4	1	2	5	1	3
4	4	4	3	4	5
4	1	2	3	4	4
4	5	3	2	2	1
4	5	4	3	4	2
4	4	4	1	2	5
4	1	1	1	2	1
4	5	5	5	5	5
5	4	3	3	1	5
5	5	4	1	5	3
5	5	2	4	3	1
5	2	4	4	4	3
5	1	4	1	1	3
5	3	1	5	2	4
5	1	5	1	5	1
5	2	1	3	1	5
5	1	1	1	1	2
5	5	5	5	5	5

block	MO	SC	UA	PD	AD
6	1	2	1	1	2
6	1	1	2	1	2
6	4	4	5	5	3
6	2	1	3	4	5
6	3	4	2	4	4
6	2	3	1	5	2
6	4	3	5	1	4
6	5	5	4	2	4
6	2	1	1	1	1
6	5	5	5	5	5
7	1	3	1	2	2
7	2	4	5	5	3
7	5	1	1	5	2
7	1	1	4	2	5
7	2	2	4	3	4
7	4	2	1	1	5
7	3	5	3	3	2
7	4	5	4	1	3
7	1	1	2	1	1
7	5	5	5	5	5
8	3	3	2	5	3
8	2	3	2	4	2
8	2	4	3	4	2
8	3	2	3	1	4
8	1	2	3	3	4
8	2	1	3	3	4
8	5	5	2	2	5
8	5	3	4	1	2
8	1	1	1	1	2
8	5	5	5	5	5
9	1	1	4	1	4
9	2	5	3	3	1
9	2	5	2	2	2
9	2	1	4	4	4
9	3	1	5	1	4
9	5	3	2	4	3
9	5	3	2	4	4
9	3	5	1	4	3
9	1	1	1	2	1
9	5	5	5	5	5
10	1	1	1	2	2
10	5	2	3	3	5
10	3	5	3	1	1
10	4	3	5	5	5
10	2	4	4	4	5
10	1	3	2	2	4
10	3	4	2	3	2
10	4	2	3	2	1
10	1	2	1	1	1
10	5	5	5	5	5

Appendix C2: The 196 pairs of EQ-5D-5L health states included in the DC task of the EQ-VT

block	MO	SC	UA	PD	AD	MO	SC	UA	PD	AD
1	3	5	5	5	4	5	5	2	1	1
1	4	3	1	4	1	2	5	5	5	4
1	3	1	1	3	5	1	1	4	4	4
1	2	5	5	1	5	2	2	2	5	1
1	4	2	4	4	1	2	1	4	1	5
1	2	2	4	1	1	4	3	1	3	3
1	3	3	2	2	5	5	3	3	1	4
2	5	2	1	3	2	2	1	5	3	4
2	3	1	3	3	1	3	5	1	2	4
2	4	2	2	5	5	5	5	5	2	4
2	2	3	2	3	5	1	1	1	4	1
2	3	4	4	1	2	5	4	2	5	3
2	3	5	3	1	2	1	4	4	2	2
2	1	3	5	5	3	3	1	2	3	4
3	5	1	3	1	1	3	2	1	5	4
3	3	4	3	5	5	4	3	3	4	2
3	1	4	3	3	3	2	4	4	2	4
3	2	2	4	5	3	1	3	4	4	2
3	4	1	5	5	2	2	2	4	2	2
3	4	5	1	1	5	5	4	2	2	5
3	1	2	1	1	2	2	2	2	1	1
4	4	4	1	1	5	2	1	4	5	5
4	2	3	4	4	3	2	5	1	1	3
4	3	1	4	5	1	4	5	4	3	1
4	4	5	5	5	2	3	2	4	1	3
4	2	5	3	3	2	5	1	5	4	4
4	4	1	1	1	4	2	4	1	4	2
4	1	1	2	1	2	2	2	1	1	2
5	1	2	1	4	5	1	5	3	4	4
5	3	3	4	2	4	4	1	5	4	2
5	3	5	5	2	1	4	3	3	5	5
5	4	4	3	2	3	2	1	5	2	5
5	5	2	1	5	5	4	5	2	3	1
5	3	3	4	4	3	5	4	1	3	3
5	1	1	2	1	1	2	2	1	1	1
6	1	3	4	3	2	1	3	2	4	5
6	2	4	3	1	4	4	3	2	2	2
6	5	1	3	5	4	4	1	3	3	5
6	4	3	2	4	4	2	5	5	2	2
6	1	2	2	5	3	1	2	5	5	1
6	2	3	5	1	3	5	2	2	5	4
6	5	4	1	2	1	4	4	3	2	2
7	2	3	5	5	1	4	3	1	3	5
7	5	1	2	5	5	3	1	3	4	3
7	1	1	3	5	2	3	1	4	1	3
7	2	5	2	1	2	3	2	4	4	3
7	4	3	4	1	2	1	3	3	4	2
7	5	4	4	2	4	1	5	3	2	1
7	3	4	1	3	4	4	5	3	2	5
8	1	4	5	5	2	5	5	3	2	5
8	5	1	1	1	4	4	1	2	5	3
8	2	5	2	3	5	1	3	4	1	3
8	2	5	1	4	5	5	2	2	4	4
8	4	5	5	3	3	1	4	4	4	4
8	5	1	5	5	2	3	5	5	1	3
8	2	1	1	1	1	1	2	1	2	1
9	2	5	3	1	2	4	1	5	3	2
9	4	1	3	1	5	1	5	1	2	1
9	4	4	3	5	1	2	4	4	1	5
9	2	4	1	4	5	3	2	2	5	3
9	5	1	4	2	4	3	5	5	2	5
9	2	3	5	5	2	3	2	2	4	4
9	1	3	2	2	2	3	1	1	3	1
10	3	5	3	2	1	5	3	2	1	5
10	2	4	4	5	3	4	1	3	3	1
10	2	1	4	2	3	1	3	1	1	4
10	5	1	3	3	1	2	2	4	2	1
10	3	5	2	3	5	4	2	3	2	5
10	2	2	5	4	4	3	5	4	5	2
10	5	1	1	3	1	3	5	3	5	3
11	1	5	2	4	4	4	4	2	4	1
11	4	4	1	5	1	5	3	2	4	2
11	2	2	4	1	3	2	2	3	3	1
11	4	1	4	2	4	3	5	5	3	3
11	4	2	4	5	2	2	3	1	4	4
11	5	3	4	2	2	4	2	5	2	5
11	2	3	1	2	2	1	2	4	1	5
12	4	3	5	3	4	3	2	1	2	5
12	2	4	1	5	5	3	2	5	3	4
12	2	2	4	3	3	1	2	4	4	3
12	5	2	4	2	2	5	5	2	5	4
12	5	5	2	4	4	5	3	5	3	1
12	2	2	2	2	2	2	5	5	1	4
12	1	2	1	1	1	2	1	1	2	1
13	4	4	1	3	4	2	2	3	5	2
13	4	2	2	4	3	3	5	4	3	3
13	2	2	5	1	2	5	5	3	1	3
13	1	5	5	3	4	4	3	4	5	4
13	5	5	1	5	3	2	2	5	2	1
13	2	1	2	3	5	1	2	2	4	3
13	1	2	5	2	1	4	1	1	1	5
14	1	1	2	1	4	4	5	3	1	2
14	2	5	3	4	2	5	1	1	5	2
14	3	4	4	4	2	1	5	2	1	4
14	2	1	1	1	4	5	2	4	3	2
14	3	5	2	5	2	3	2	2	5	4
14	4	2	5	1	2	2	3	5	4	4
14	5	4	3	4	4	1	5	4	1	1

Appendix C2 cont.: The 196 pairs of EQ-5D-5L health states included in the DC task of the EQ-VT

block	MO	SC	UA	PD	AD	MO	SC	UA	PD	AD
15	5	5	3	3	5	5	3	4	4	2
15	4	5	5	4	2	4	2	1	3	3
15	1	2	1	5	1	3	5	5	4	3
15	4	3	2	4	5	3	4	3	2	4
15	1	3	5	1	5	1	1	3	2	4
15	4	1	3	1	2	2	4	2	5	3
15	1	1	1	2	1	2	1	2	1	1
16	2	3	4	4	2	2	5	4	1	4
16	5	2	5	4	4	3	4	2	2	2
16	5	2	2	1	1	1	1	3	2	5
16	3	3	2	2	4	4	2	1	1	3
16	5	1	1	2	3	4	3	4	5	1
16	1	5	2	4	1	1	2	3	5	2
16	1	4	3	4	4	5	2	4	5	4
17	5	2	5	2	3	5	4	1	4	2
17	2	3	4	5	1	3	4	3	5	4
17	5	3	5	5	1	2	1	2	2	4
17	5	3	1	2	5	3	1	4	1	5
17	1	5	1	1	3	1	4	4	3	4
17	1	3	3	3	4	4	5	4	4	1
17	1	1	1	2	2	2	3	1	1	1
18	3	3	2	2	3	2	1	2	3	2
18	3	1	5	2	1	4	3	1	5	2
18	4	4	1	2	3	5	1	2	3	2
18	1	4	4	5	5	1	5	5	1	4
18	2	5	5	4	5	3	5	2	2	5
18	3	3	1	1	1	3	2	5	4	5
18	4	1	4	3	1	2	4	2	1	2
19	3	5	2	3	1	5	3	5	5	4
19	4	2	4	2	1	5	4	2	5	5
19	5	4	4	2	3	3	2	3	1	4
19	2	3	2	3	3	1	2	4	1	1
19	2	2	1	2	3	1	1	1	5	5
19	2	1	4	4	5	5	5	1	4	1
19	5	4	4	5	4	2	4	5	1	1
20	3	5	2	1	1	4	2	5	5	1
20	3	4	1	3	2	2	4	4	4	5
20	2	4	5	2	3	4	5	1	2	5
20	5	2	1	1	1	1	1	4	3	1
20	2	1	3	5	4	4	1	3	2	1
20	5	4	5	5	5	3	5	5	3	5
20	1	1	4	4	5	3	2	1	1	5
21	1	3	1	1	1	1	1	2	1	5
21	1	3	2	5	1	5	3	3	1	3
21	4	4	2	3	4	3	3	4	4	1
21	2	1	5	2	2	2	5	3	2	4
21	4	5	5	1	5	3	4	4	3	3
21	4	3	5	2	5	2	3	4	4	4
21	4	2	1	5	3	5	3	1	5	1
22	2	2	3	4	1	4	5	1	4	5
22	3	2	3	3	4	2	2	2	5	4
22	4	1	5	4	5	3	3	5	3	1
22	5	5	2	3	5	2	2	5	3	3
22	1	5	4	2	4	3	3	3	2	2
22	3	2	2	4	1	5	1	5	2	5
22	3	2	2	1	1	1	4	2	1	1
23	1	1	5	1	2	2	2	2	4	1
23	3	4	3	4	5	5	1	3	2	5
23	4	2	1	2	2	3	1	3	2	5
23	4	5	5	3	1	1	4	3	3	4
23	5	1	2	1	4	4	5	1	5	3
23	1	5	3	5	1	1	4	3	1	2
23	2	1	3	3	5	4	4	5	5	1
24	3	2	4	4	2	5	4	4	4	1
24	1	1	5	4	5	1	4	1	1	3
24	5	2	2	2	3	5	4	1	3	2
24	1	1	2	3	4	2	1	5	3	2
24	3	5	3	2	2	4	1	5	3	5
24	1	3	1	3	1	2	3	1	1	3
24	5	5	5	3	4	3	3	3	5	5
25	3	3	4	3	2	1	5	5	5	1
25	1	4	1	2	2	5	4	2	3	1
25	5	1	3	2	4	3	4	5	4	3
25	3	3	2	4	3	1	1	1	1	5
25	3	4	2	3	4	1	3	5	3	3
25	2	3	5	3	1	5	3	1	3	3
25	5	3	5	4	3	4	1	2	1	5
26	4	4	5	2	1	4	1	1	5	3
26	5	4	4	5	5	5	5	2	3	4
26	4	4	2	3	1	2	5	5	3	3
26	1	5	5	5	5	5	3	4	5	5
26	2	2	3	4	3	3	4	5	1	3
26	1	1	1	1	2	1	2	2	2	1
26	2	1	1	1	2	1	2	2	1	1
27	1	4	5	3	3	2	1	5	4	2
27	2	3	1	3	4	1	4	3	1	4
27	5	3	4	3	1	5	2	2	5	5
27	5	1	5	2	2	4	5	2	4	4
27	1	4	2	2	4	3	2	3	2	2
27	4	4	1	4	5	4	5	4	3	2
27	1	1	2	2	1	2	2	1	2	2
28	4	2	3	2	3	5	5	2	2	3
28	4	1	3	2	5	1	3	4	4	5
28	3	4	3	3	3	3	3	1	4	2
28	2	3	2	3	1	2	5	3	2	3
28	3	1	4	4	4	1	1	3	5	3
28	1	5	3	3	5	4	3	5	3	2
28	3	5	4	3	1	5	1	3	2	3