Online Elicitation of Personal Utility Functions (OPUF) for EQ-5D-5L Health States

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🏠 bitowaqr.github.io/
🐦 @waqr

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**wellcome**

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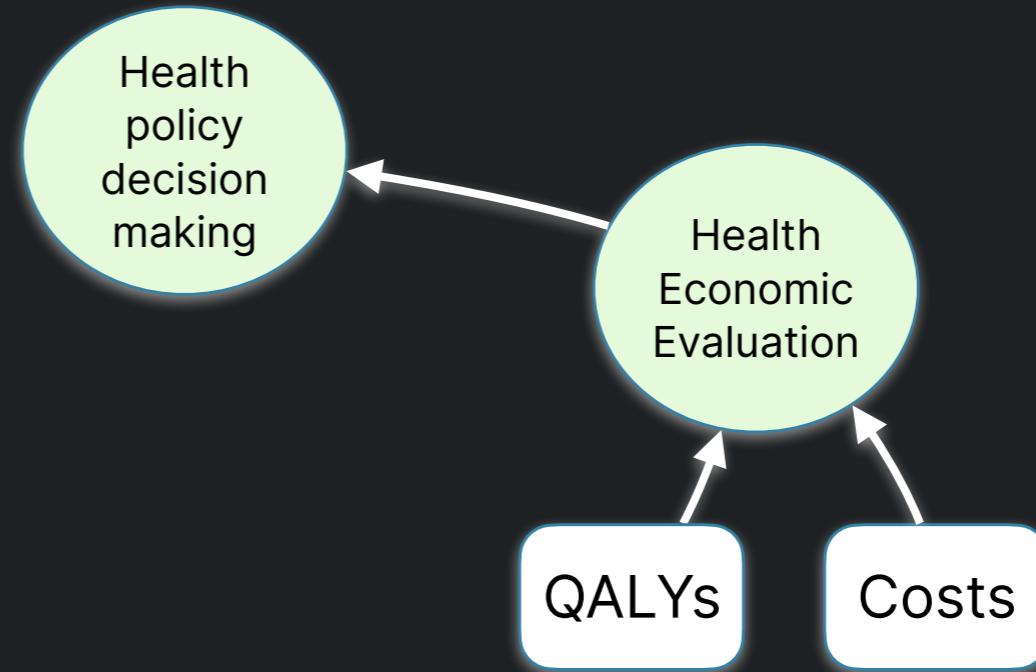
Outline

- Background: EQ-5D & health valuation

- 2 paradigms in preference elicitation

- (O)PUF development and demo

- UK study – preliminary results
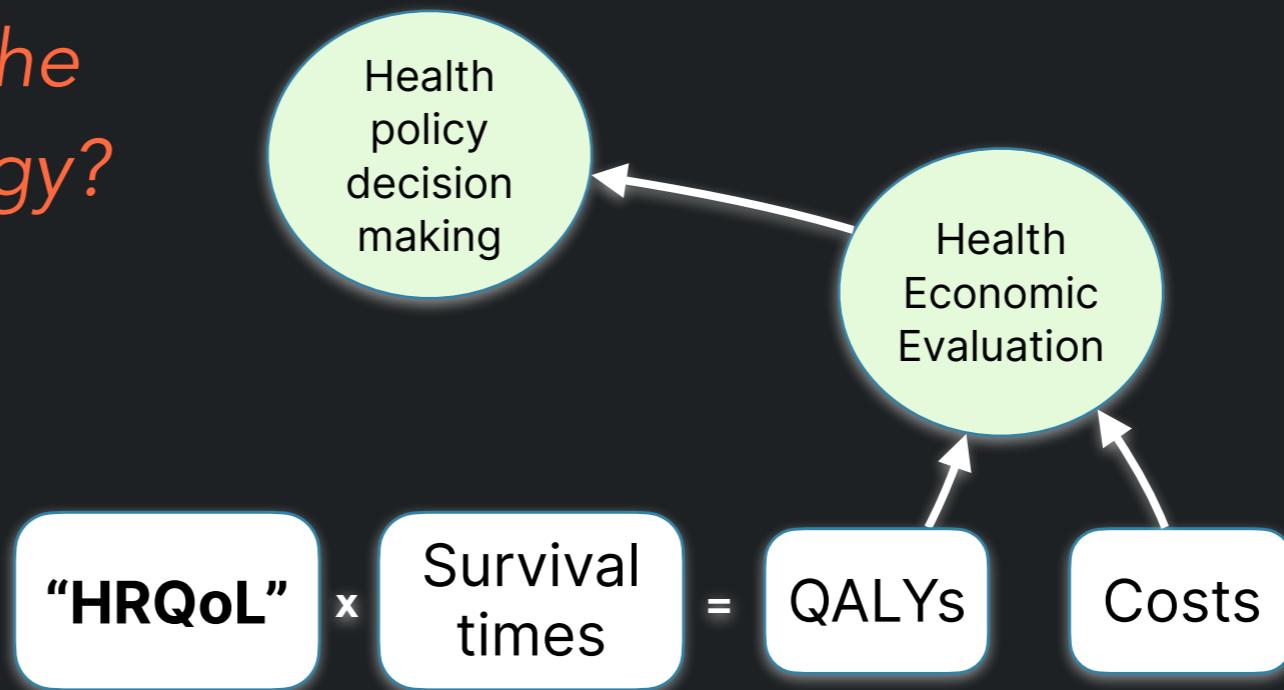
Should we adopt the new drug/technology?
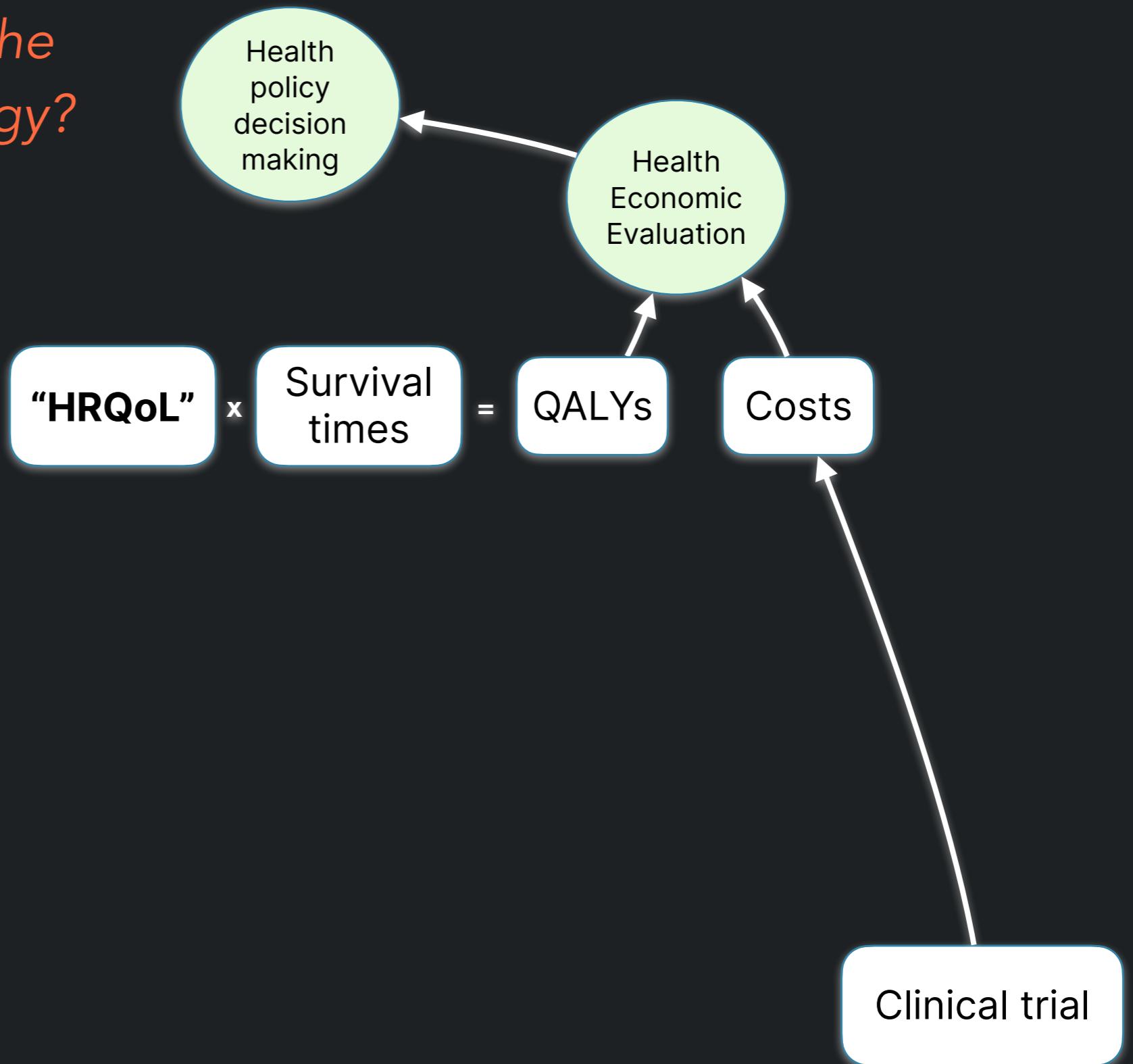
Health policy decision making

Should we adopt the new drug/technology?
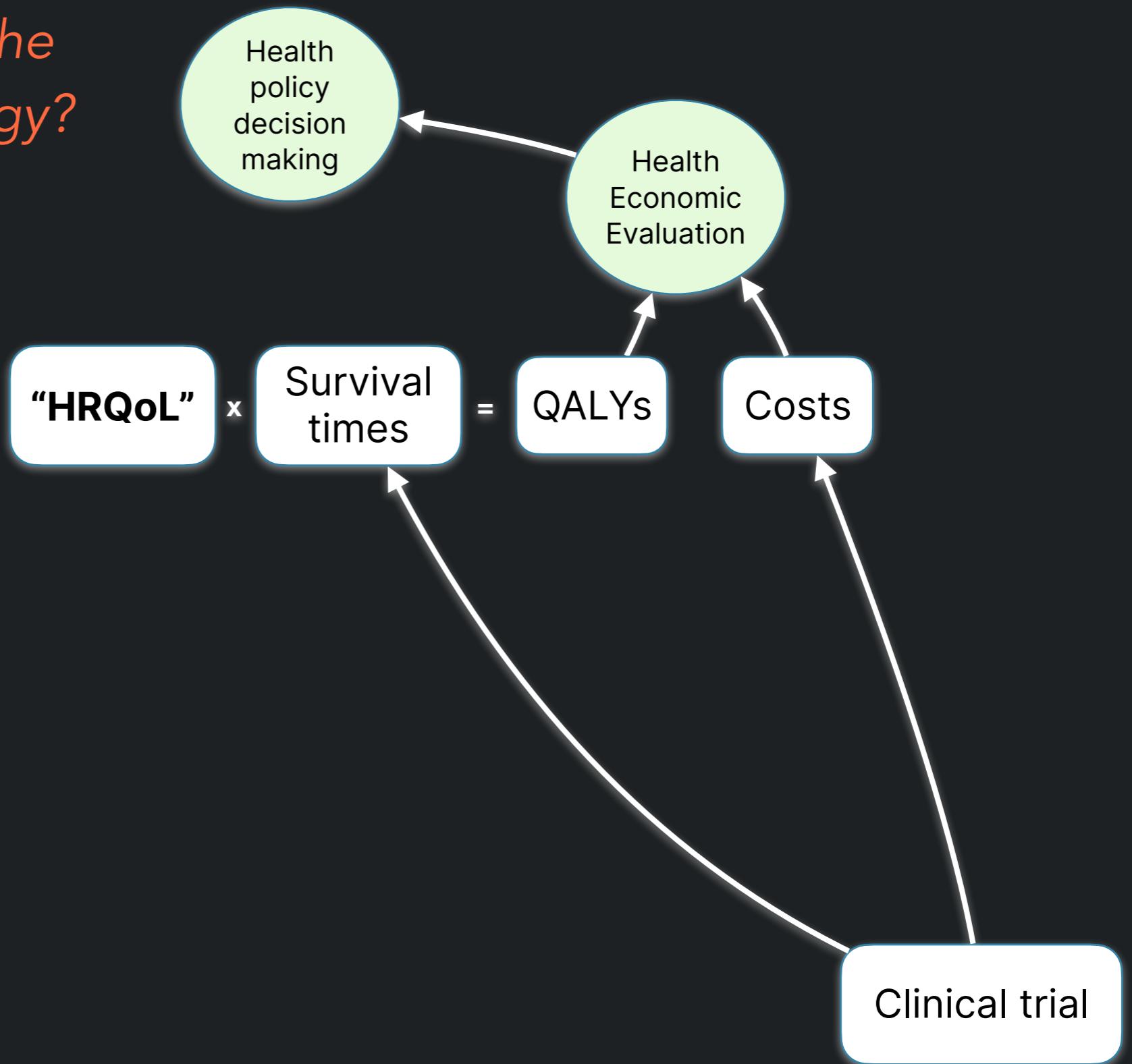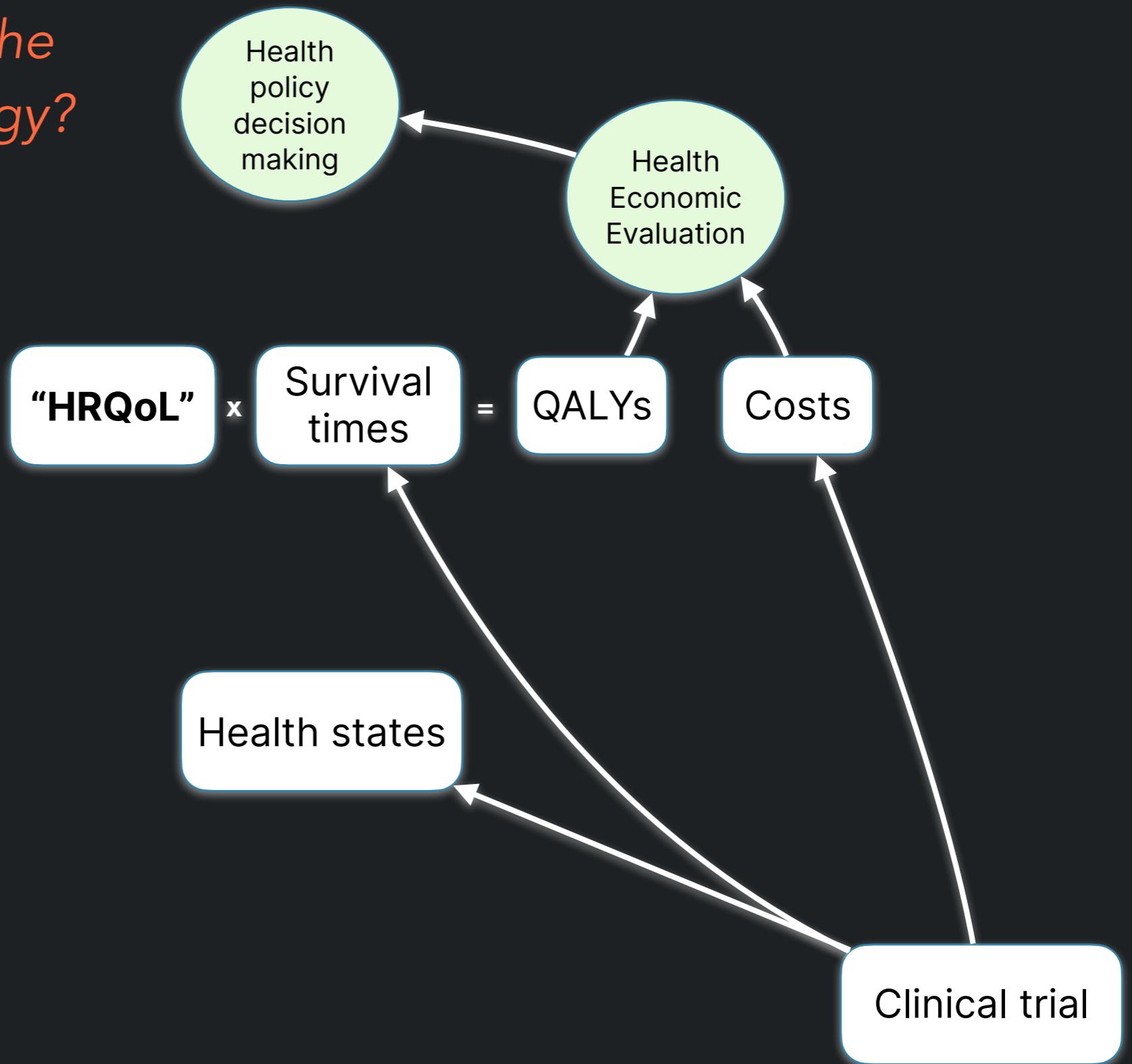
Health policy decision making

Health Economic Evaluation

QALYs   Costs

Should we adopt the new drug/technology?

Health policy decision making

Health Economic Evaluation

"HRQoL" x Survival times = QALYs   Costs

Social tariff

Health states

Health valuation study

Participants

Clinical trial
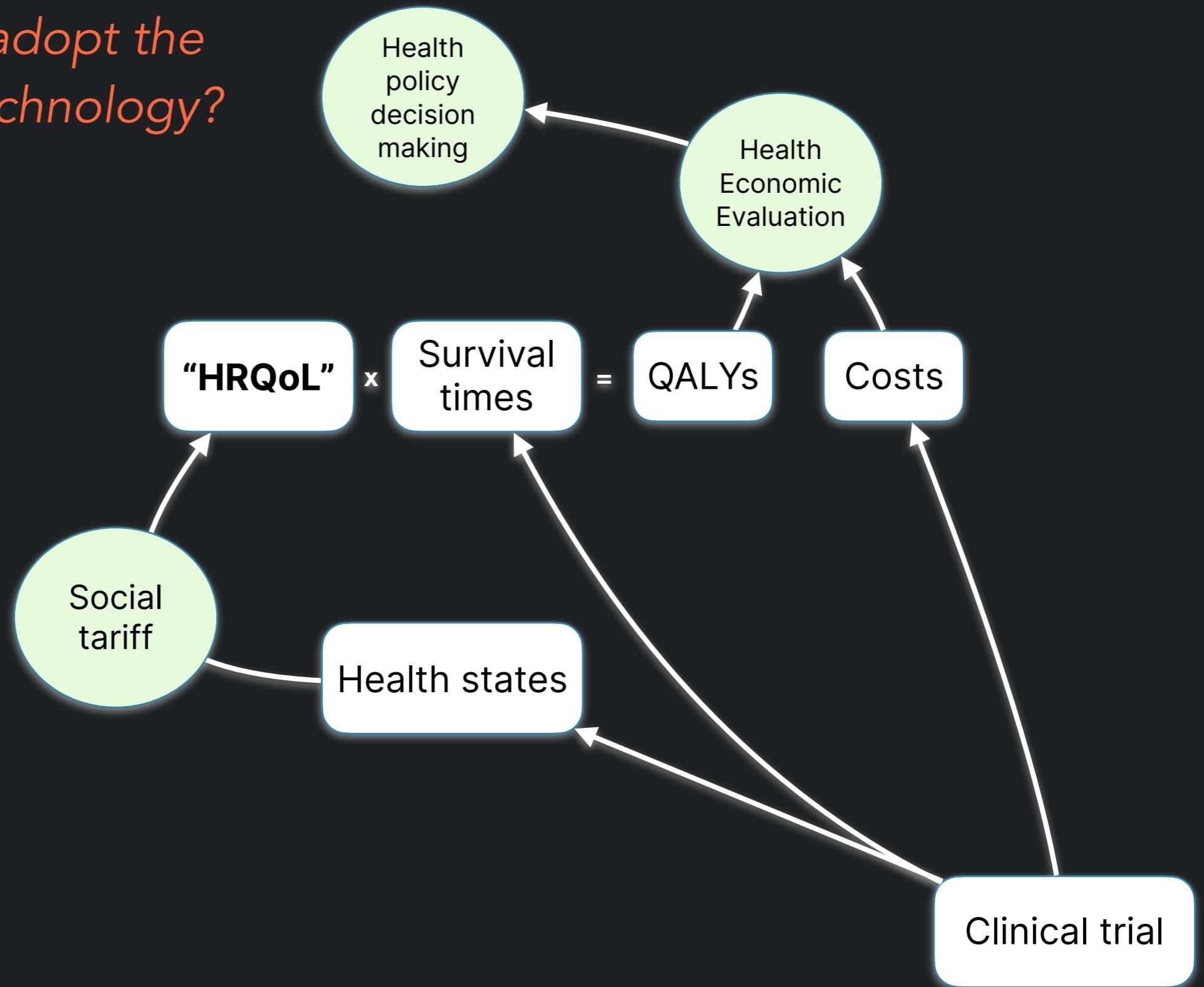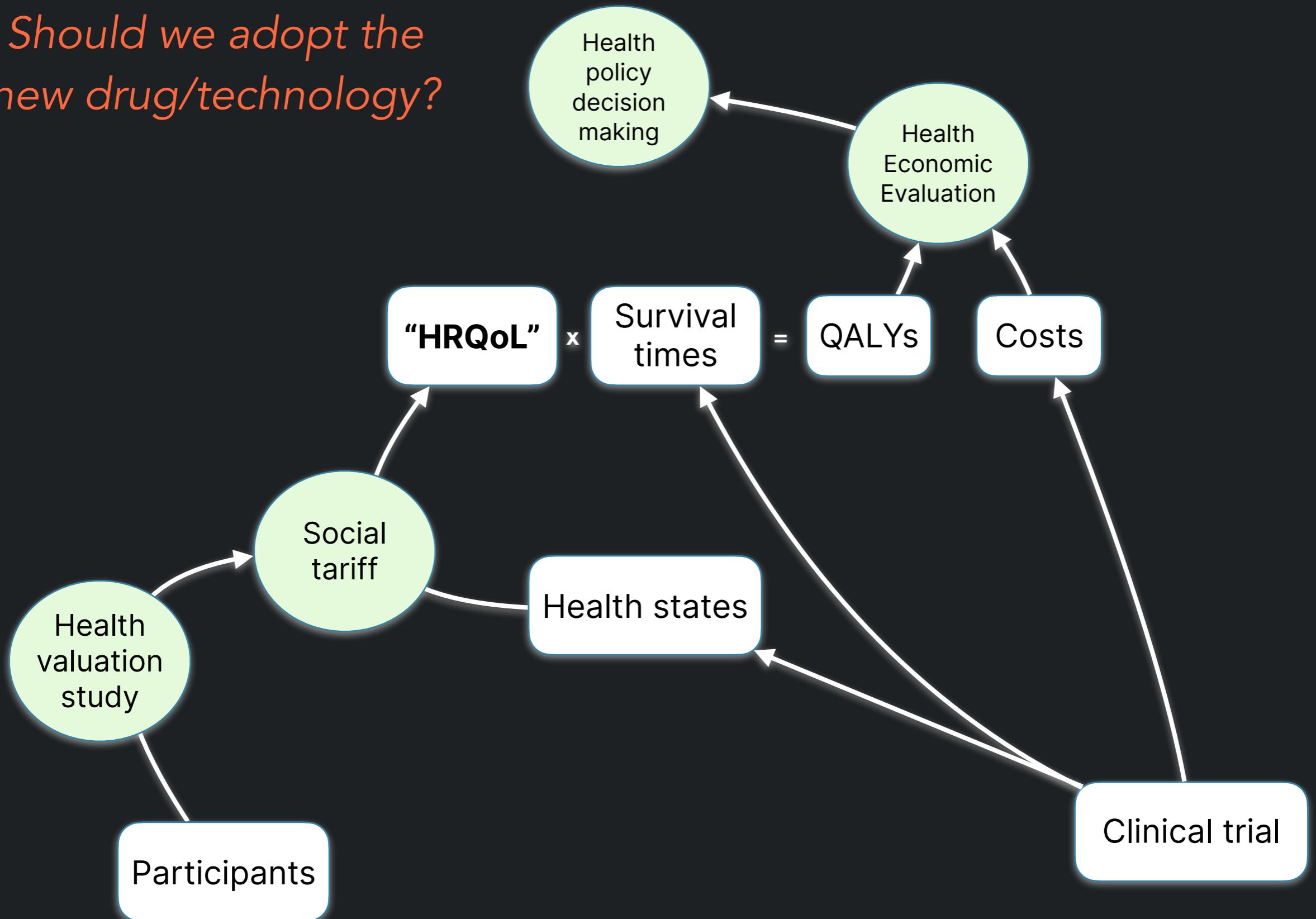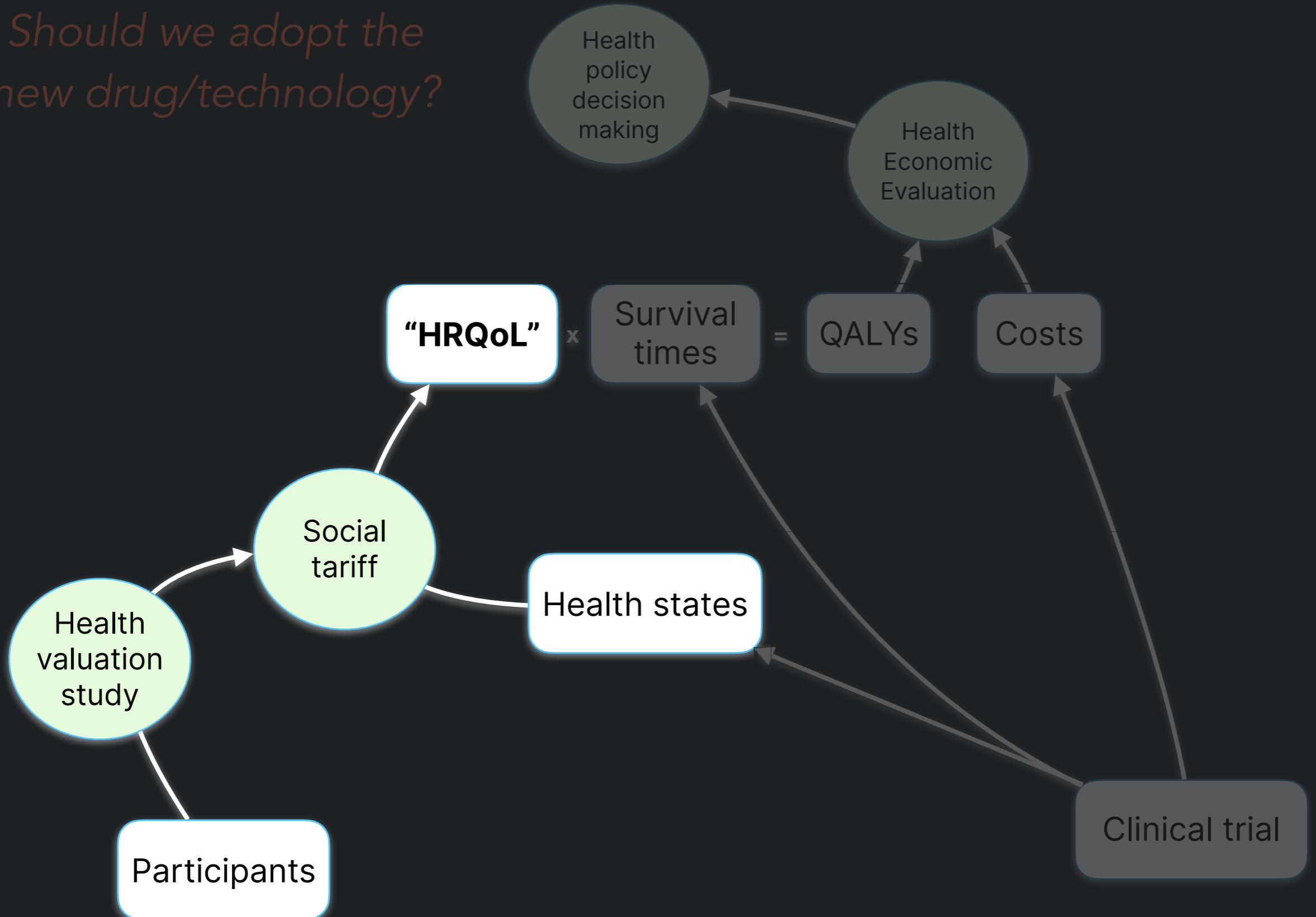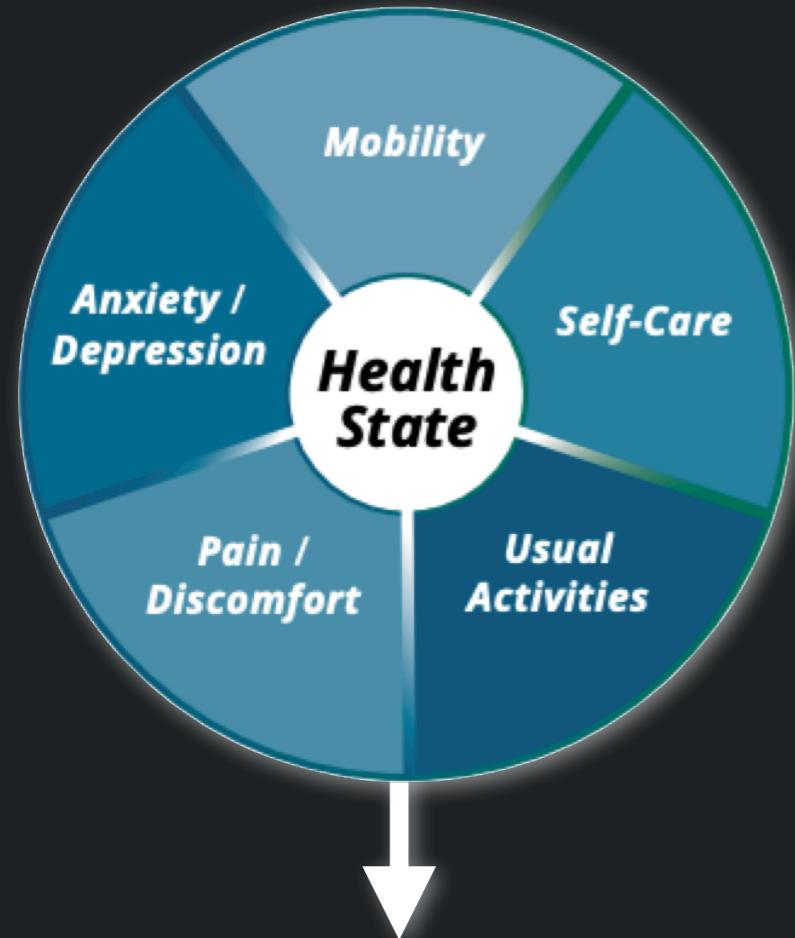
The EQ-5D-5L Instrument

1. No problems
2. Slight problems
3. Moderate problems
4. Severe problems
5. Extreme problems

Under each heading, please tick the ONE box that best describes your health TODAY

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 (e.g. work, study, housework, family or leisure 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 ☐
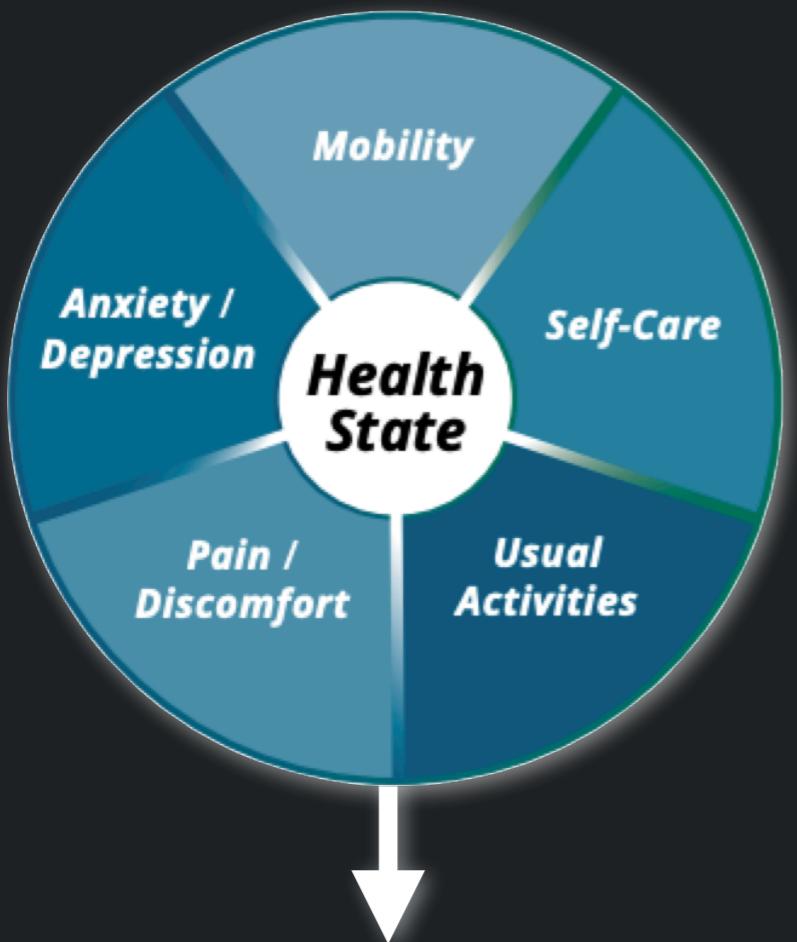
PAIN / DISCOMFORT
I have no pain or discomfort ☒
I have slight pain or discomfort ☐
I have moderate pain or discomfort ☐
I have severe pain or discomfort ☐
I have extreme pain or discomfort ☐

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 ☐

The EQ-5D-5L Instrument

Mobility

Anxiety / Depression

Self-Care

Health State

Pain / Discomfort

Usual Activities

1 No problems in walking about
1 No problems with self-care
1 No problems with usual activities
1 No pain or discomfort
1 No anxiety or depression

2 Slight problems walking about
1 No problems with self-care
1 No problems with usual activities
1 No pain or discomfort
1 No anxiety or depression

... **3,122 o**ther intermediate states

5 Unable to walk about
5 Unable to wash or dress yourself
5 Unable to perform usual activities
**5** Extreme pain or discomfort
5 Extreme anxiety or depression

1. No problems
2. Slight problems
3. Moderate problems
4. Severe problems
5. Extreme problems

The EQ-5D-5L Instrument
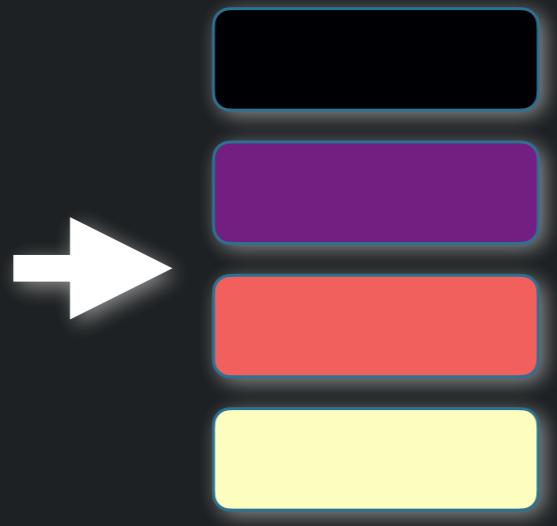
Social tariff
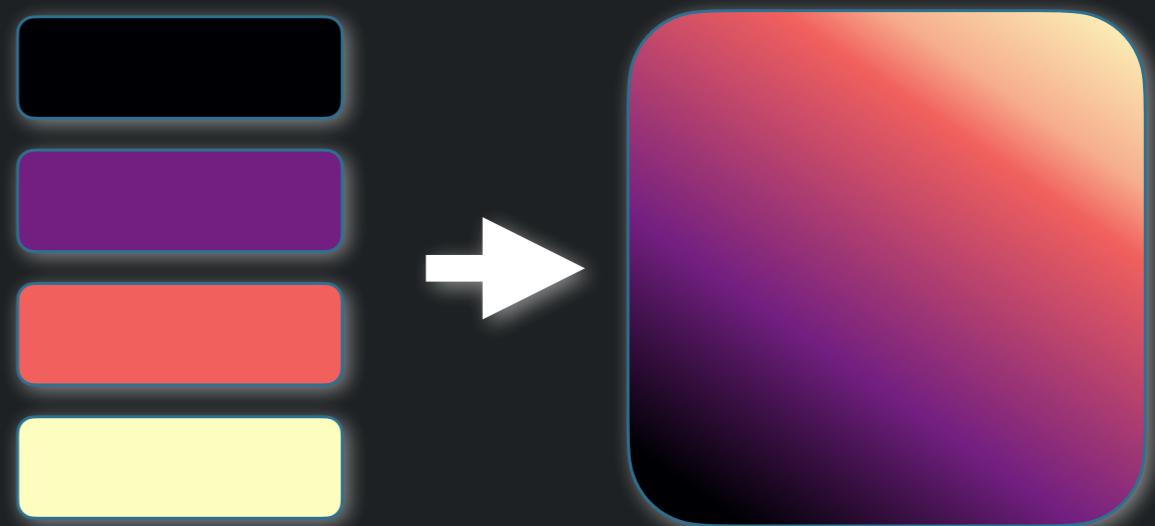
11111	=	1
21111	=	?
12111	=	?
11211	=	?
...	=	...
55455	=	?
55545	=	?
55554	=	?
55555	=	?

Health State

- Mobility
- Self-Care
- Usual Activities
- Pain / Discomfort
- Anxiety / Depression

1. No problems
2. Slight problems
3. Moderate problems
4. Severe problems
5. Extreme problems

Decompositional

12345

I have no problems in walking about
I have slight problems washing or dressing myself
Moderate problems with usual activities
I have severe pain or discomfort
I am extremely anxious or depressed

<u>= 0.3</u>

TTO, SG, DCE, etc.

Decompositional

12345

	I have no problems in walking about
	I have slight problems washing or dressing myself
	Moderate problems with usual activities
	I have severe pain or discomfort
	I am extremely anxious or depressed

= 0.3

TTO, SG, DCE, etc.

EQ-5D-5L Scoring Algorithm

	Partial value
Mobility	
No	0
Slight	0.058
Moderate	0.076
Severe	0.207
Unable	0.274
Self-care	
No	0
Slight	0.050
Moderate	0.080
Severe	0.164
Unable	0.203
Usual activities	
No	0
Slight	0.050
Moderate	0.063
Severe	0.162
Unable	0.184
Pain/discomfort	
No	0
Slight	0.063
Moderate	0.084
Severe	0.276
Extreme	0.335
Anxiety/depression	
No	0
Slight	0.078
Moderate	0.104
Severe	0.285
Extreme	0.289

Compositional

OPUF

EQ-5D-5L Scoring Algorithm

	Partial value
Mobility	
No	0
Slight	0.058
Moderate	0.076
Severe	0.207
Unable	0.274
Self-care	
No	0
Slight	0.050
Moderate	0.080
Severe	0.164
Unable	0.203
Usual activities	
No	0
Slight	0.050
Moderate	0.063
Severe	0.162
Unable	0.184
Pain/discomfort	
No	0
Slight	0.063
Moderate	0.084
Severe	0.276
Extreme	0.335
Anxiety/depression	
No	0
Slight	0.078
Moderate	0.104
Severe	0.285
Extreme	0.289
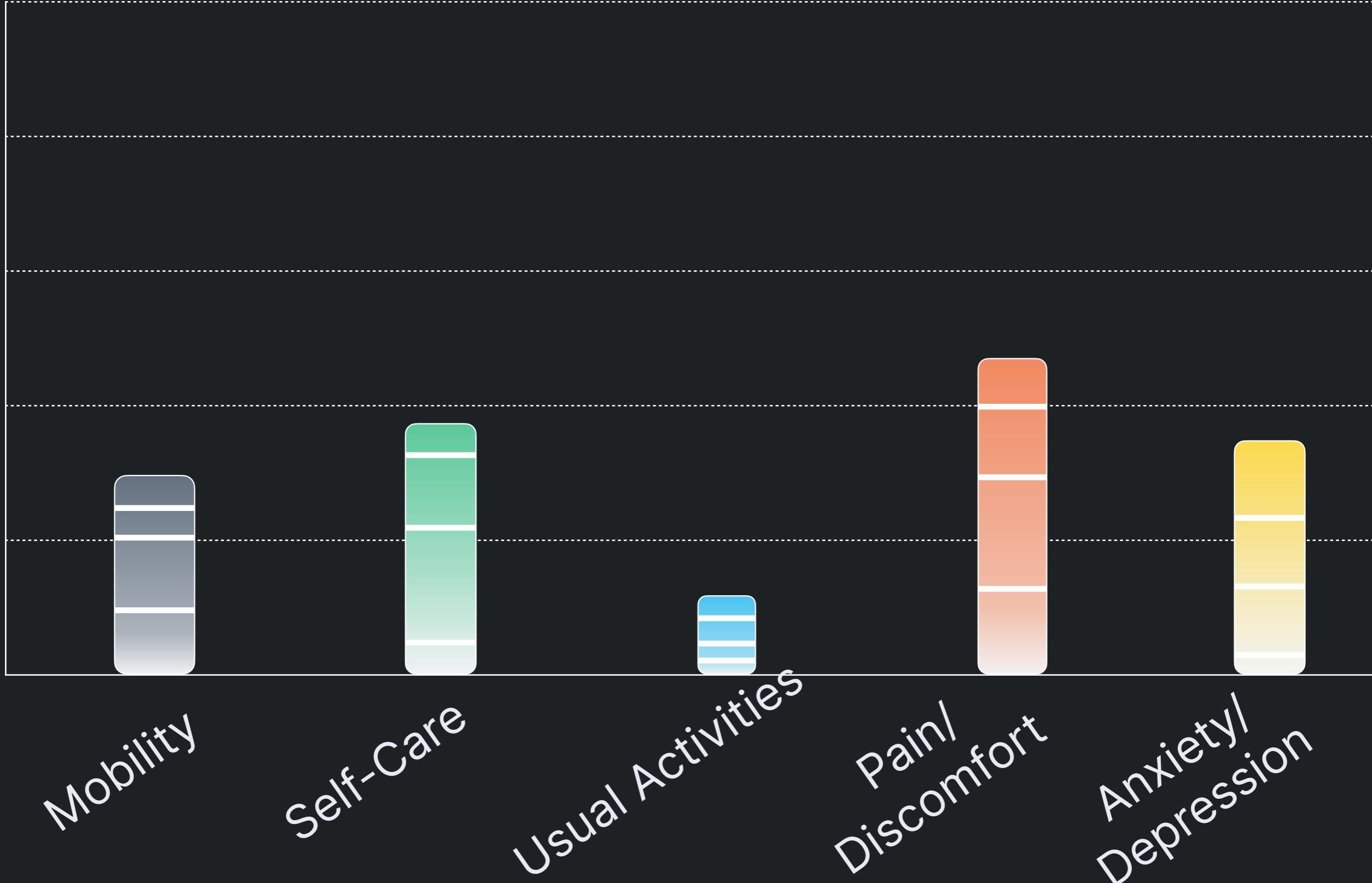
1 Criteria Weighting

Mobility · Self-Care · Usual Activities · Pain/Discomfort · Anxiety/Depression

2 Level Rating

Mobility · Self-Care · Usual Activities · Pain/Discomfort · Anxiety/Depression

3 Anchoring

PUF → OPUF

1) Warm-up

2) Ranking

3) Swing rating

4) Level rating

5) DCE – Validation

6) Dead-PC

7) DCE - Interaction

ORIGINAL PAPER

CrossMark

A new method for valuing health: directly eliciting personal utility functions

Nancy J. Devlin[1,2] · Koonal K. Shah[1,2] · Brendan J. Mulhern[3] · Krystallia Pantiri[4] · Ben van Hout[2,5]

Abstract

Background Standard methods for eliciting the preference data upon which 'value sets' are based generally have in common an aim to 'uncover' people's preferences by asking them to evaluate a subset of health states, then using their responses to infer their preferences over all dimensions and levels. An alternative approach is to ask people directly about the relative importance to them of the dimensions, levels and interactions between them. This paper describes a new stated preference approach for directly eliciting personal utility functions (PUFs), and reports a pilot study to test its feasibility for valuing the EQ-5D.

Methods A questionnaire was developed, designed to directly elicit PUFs from general public respondents via computer-assisted personal interviews, with a focus on helping respondents to reflect and deliberate on their preferences. The questionnaire was piloted in England.

Results Seventy-six interviews were conducted in December 2015. Overall, pain/discomfort and mobility were found to be the most important of the EQ-5D dimensions. The ratings for intermediate improvements in each dimension show heterogeneity, both within and between respondents. Almost a quarter of respondents indicated that no EQ-5D health states are worse than dead.

Discussion The PUF approach appears to be feasible, and has the potential to yield meaningful, well-informed preference data from respondents that can be aggregated to yield a value set for the EQ-5D. A deliberative approach to health state valuation also has the potential to complement and develop existing valuation methods. Further refinement of some elements of the approach is required.

☰

EQ-5D 3L

Under each heading, please tick the ONE box that best describes your health TODAY

Mobility

○ I have a problem withI have no problems in walking about

○ I have a problem withI have some problems in walking about

○ I have a problem withI am confined to bed

Self-care
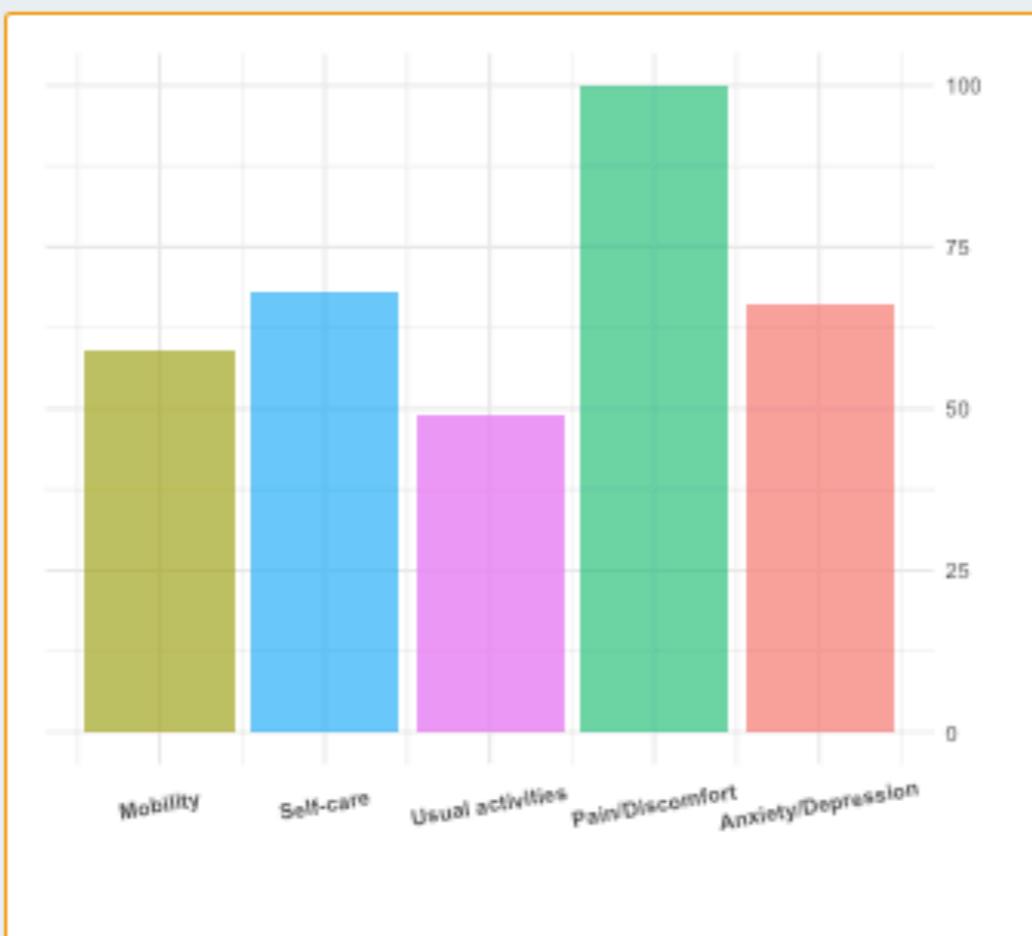
○ I have a problem withI have no problems with self-care

○ I have a problem withI have some problems washing or dressing myself

○ I have a problem withI am unable to wash or dress myself

Usual activities

○ I have a problem withI have no problems with performing my usual activities

○ I have a problem withI have some problems with performing my usual activities

○ I have a problem withI am unable to perform my usual activities

# Personal EQ-5D 5L Value Assessment
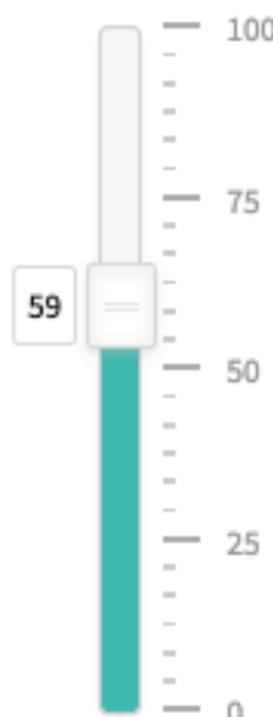
Mobility

Moving from:

I am unable to walk about

to:

I have no problems in walking about

`59`
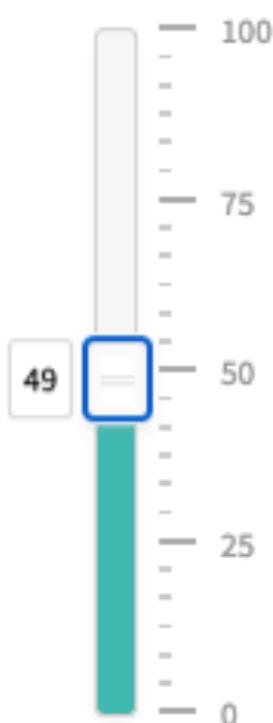
Usual activities

Moving from:

I am unable to do my usual activities

to:

I have no problems doing my usual activities

`49`
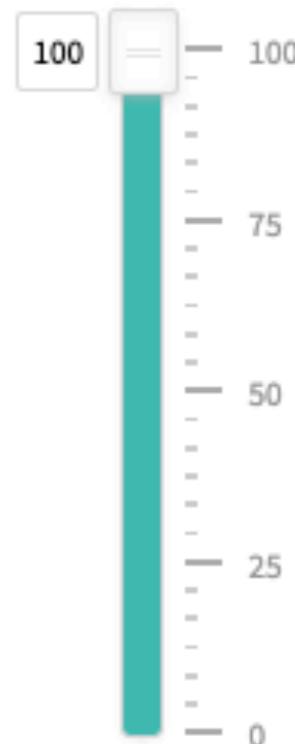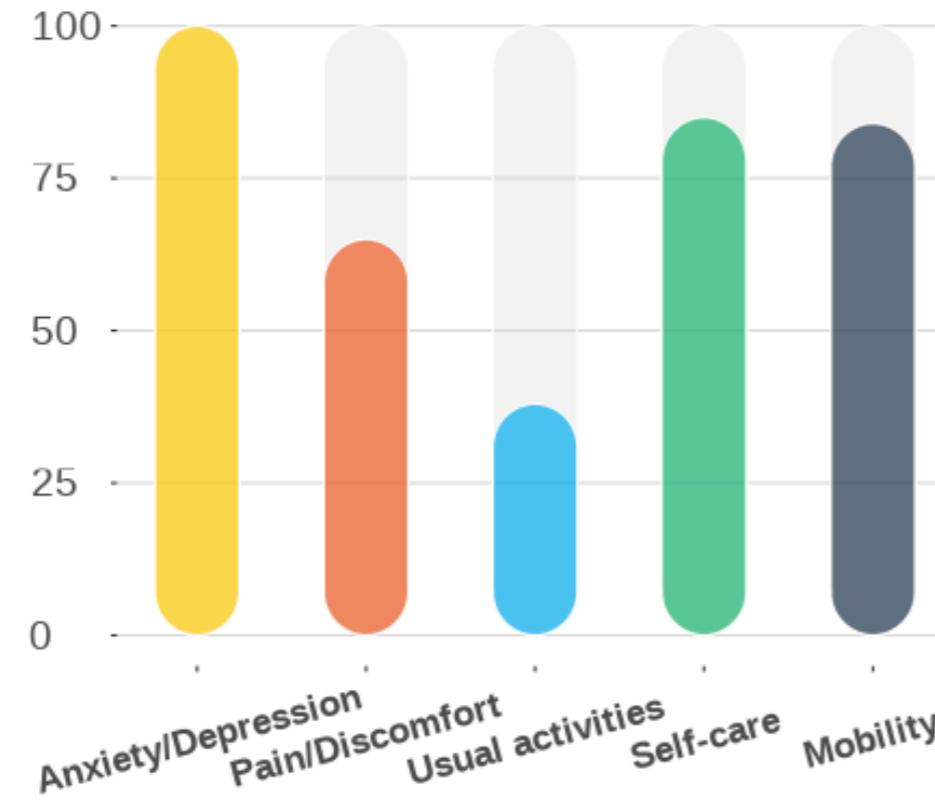
Pain/Discomfort

Moving from:

I have extreme pain or discomfort

to:

I have no pain or discomfort

`100`
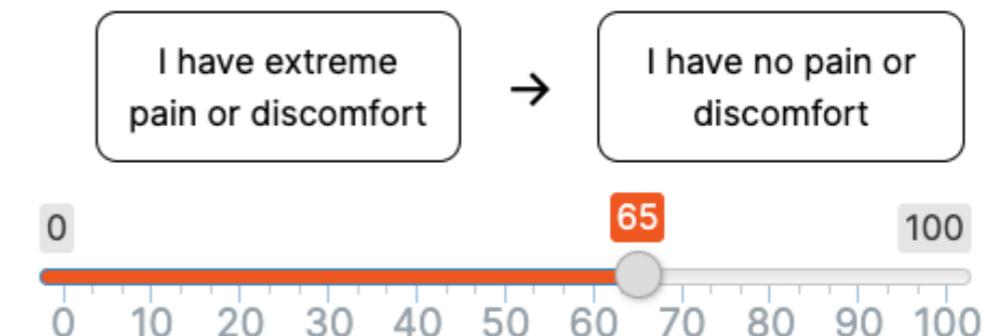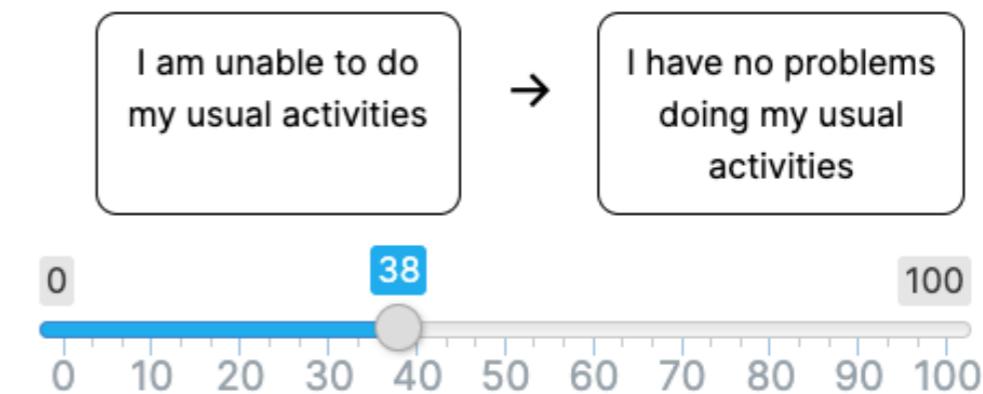
PAIN/DISCOMFORT

How important is this improvement to you?

| I have extreme pain or discomfort | → | I have no pain or discomfort |

0   **65**   100

0 10 20 30 40 50 60 70 80 90 100

USUAL ACTIVITIES (e.g. work, study, housework, family)

How important is this improvement to you?

| I am unable to do my usual activities | → | I have no problems doing my usual activities |

0   **38**   100

0 10 20 30 40 50 60 70 80 90 100

SELF-CARE

How important is this improvement to you?

Use the scale on the right to change the numbers

At `100%` health a person has No health problems

At `75%` health a person has Slight health problems

At `50%` health a person has Moderate health problems

At `25%` health a person has Severe health problems

At `0%` health a person has Extreme health problems

Scenario A

I have no problems in walking about

I have no problems washing or dressing myself

I have moderate problems doing my usual activities

I have no pain or discomfort

I am not anxious or depressed

Scenario B

I have slight problems in walking about

I have no problems washing or dressing myself

I have slight problems doing my usual activities

I have no pain or discomfort

I am not anxious or depressed

Which is better?

Scenario A   Scenario B

Scenario A

I have severe problems in walking about

I have slight problems washing or dressing myself

I have slight problems doing my usual activities

I have severe pain or discomfort

I am not anxious or depressed

Scenario B

I have slight problems in walking about

I have no problems washing or dressing myself

I have slight problems doing my usual activities

I have no pain or discomfort

I am not anxious or depressed

Which is better?

Scenario A   Scenario B

Scenario A

Scenario B

I have slight problems in walking about

I have no problems washing or dressing myself

I have slight problems doing my usual activities

I have no pain or discomfort

I am not anxious or depressed

Which is better?

Scenario A Scenario B

Consider the following five statements, each of which describes a different problem. For each statement, imagine what it would be like for you to experience that problem. In each case, you would have that problem, but you would have no problems with any other aspect of your health. We want you to consider each description individually.

Which one of those health problems would you LEAST want to have? Drag-and-drop that statement into the top cell in the right 'Rank 1: Worst'

Of the health problems that remain, which would you LEAST want to have?

Drag-and-drop that statement into the cell 'Rank 2'. Continue until you have ranked all five health problems. If you think two or more problems are as bad as each other you can show this by dropping them into the same cell.

After all statements are ranked, click 'Continue' at the bottom to go to the next task.

NOTE: Start with the worst: which one of the health problems would you LEAST want to? Drag it to the right to assign it the 1st rank.

→

Consider the following five statements.

Imagine what it would be like for you to experience that problem, but no other health problems.

Rank all five problems by dragging them from the left to the box on the right.

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WELCOME

Personal Value of Health Online Tool

This is a demo version of the Online PUF survey instrument. Please feel free to start the survey, explore the tool, and try the different tasks.

The following web pages will guide you through a series of questions and exercises. In some questions, we will ask you about your own health, and to compare different health problems. In other questions, we will ask you to make choices between different scenarios involving poor health, disability, and death. There are no right or wrong answers - it's just about your own perspective.

The survey will take about 15 minutes to complete.

At the end of the survey, all your responses will be combined. You can then compare your personal results to the responses of the general population.

This is only a demo version. Your responses will not be used for the research project. All your data will be deleted at the end of this session, i.e. when you close this window.

Thank you very much for your interest in this research project!

Start the survey

https://eq5d5l.me

Want to receive updates?

If you would like to receive updates about this research project, want to collaborate, or if you have any other questions, please contact:
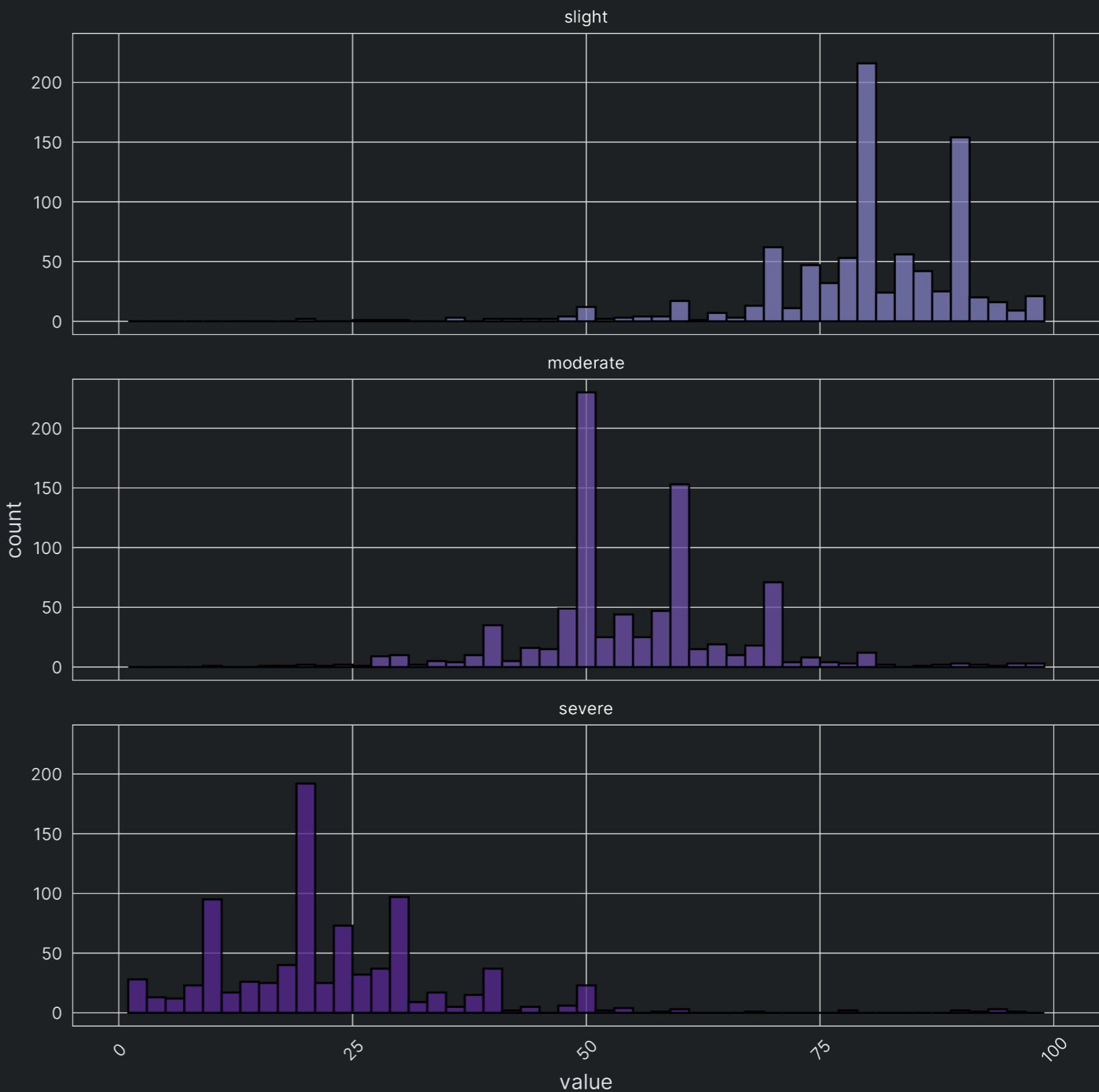
Paul Schneider
School of Health and Related Research
University of Sheffield
p.schneider@sheffield.ac.uk

(Preliminary) results: Sample

- 1,000 participants from the UK
- Representative (age, sex, ethnicity)
- Data from 126 participants were excluded bc they skipped one or more valuation steps

⇒ Data from n=874 were included in the analysis

1 Level Rating

Severity level	Rating Mean (SD)
No problems	100 (0)
Slight	80.23 (11.23)
Moderate	55.61 (11.55)
Severe	23.47 (13.18)
Extreme	0 (0)
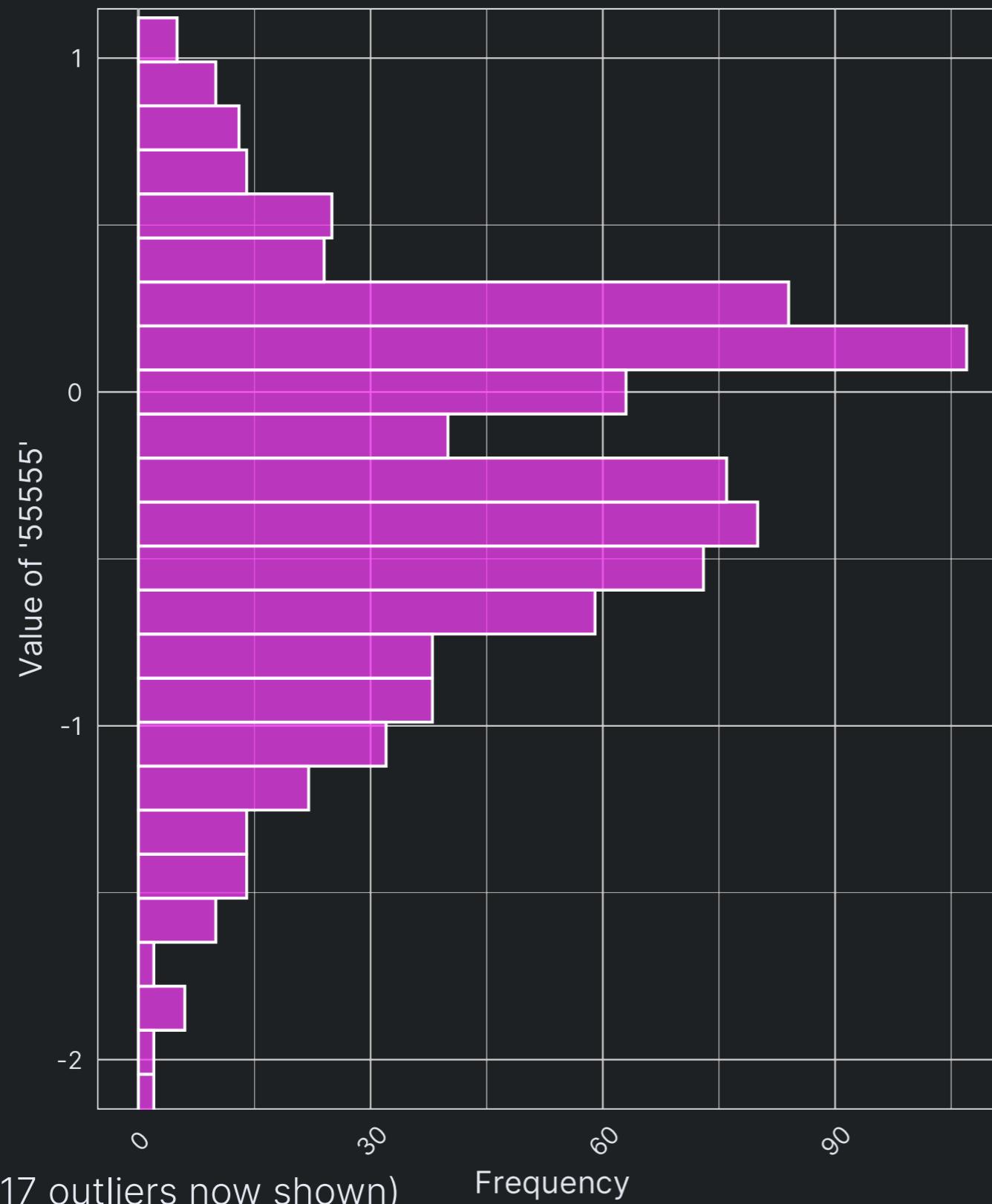
2 Dimension weighting

Dimension	Weight	Implied rank
Mobility	82.88 (20.71)	2
Self-Care	82.87 (20.47)	3
Usual Activities	73.71 (22.15)	5
Pain/Discomfort	90.05 (16.61)	1
Anxiety/Depression	75.8 (24.15)	4

3 Anchoring

Mean (SD) = -0.37 (0.83)
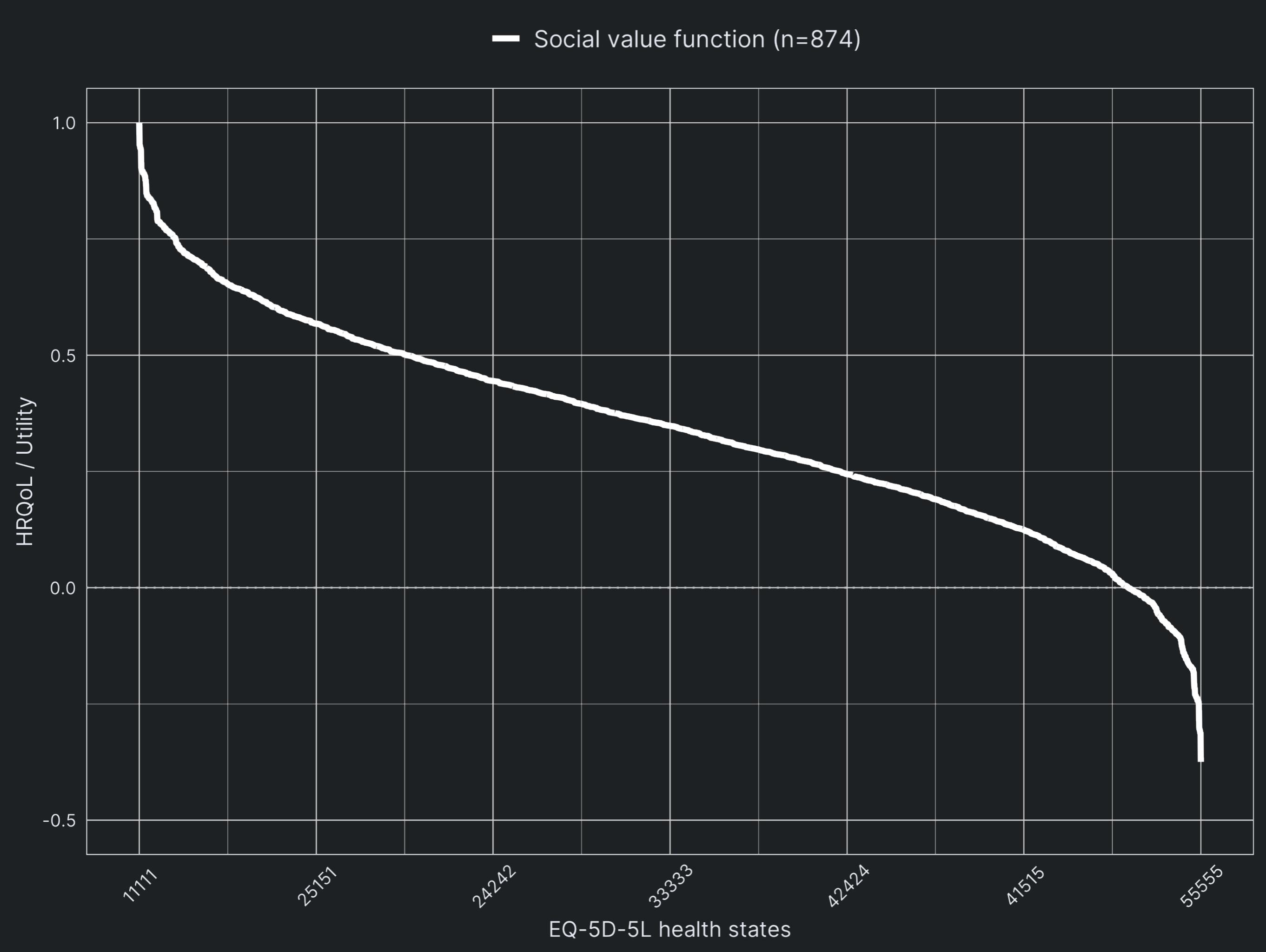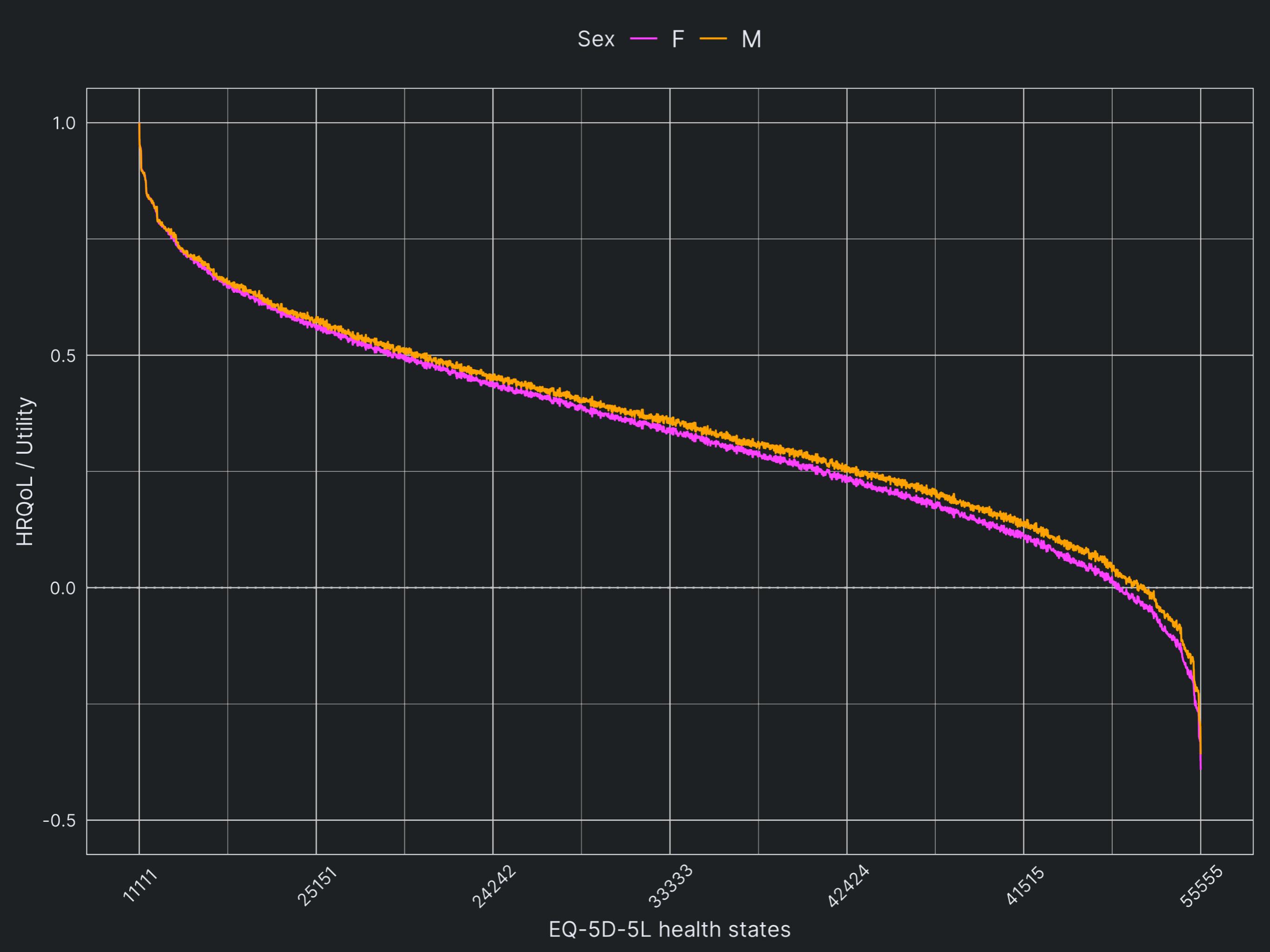
'55555' >= dead
N=342 (39%)

'55555' < dead
N=532 (61%)

Value of '55555'

(17 outliers now shown)

Frequency
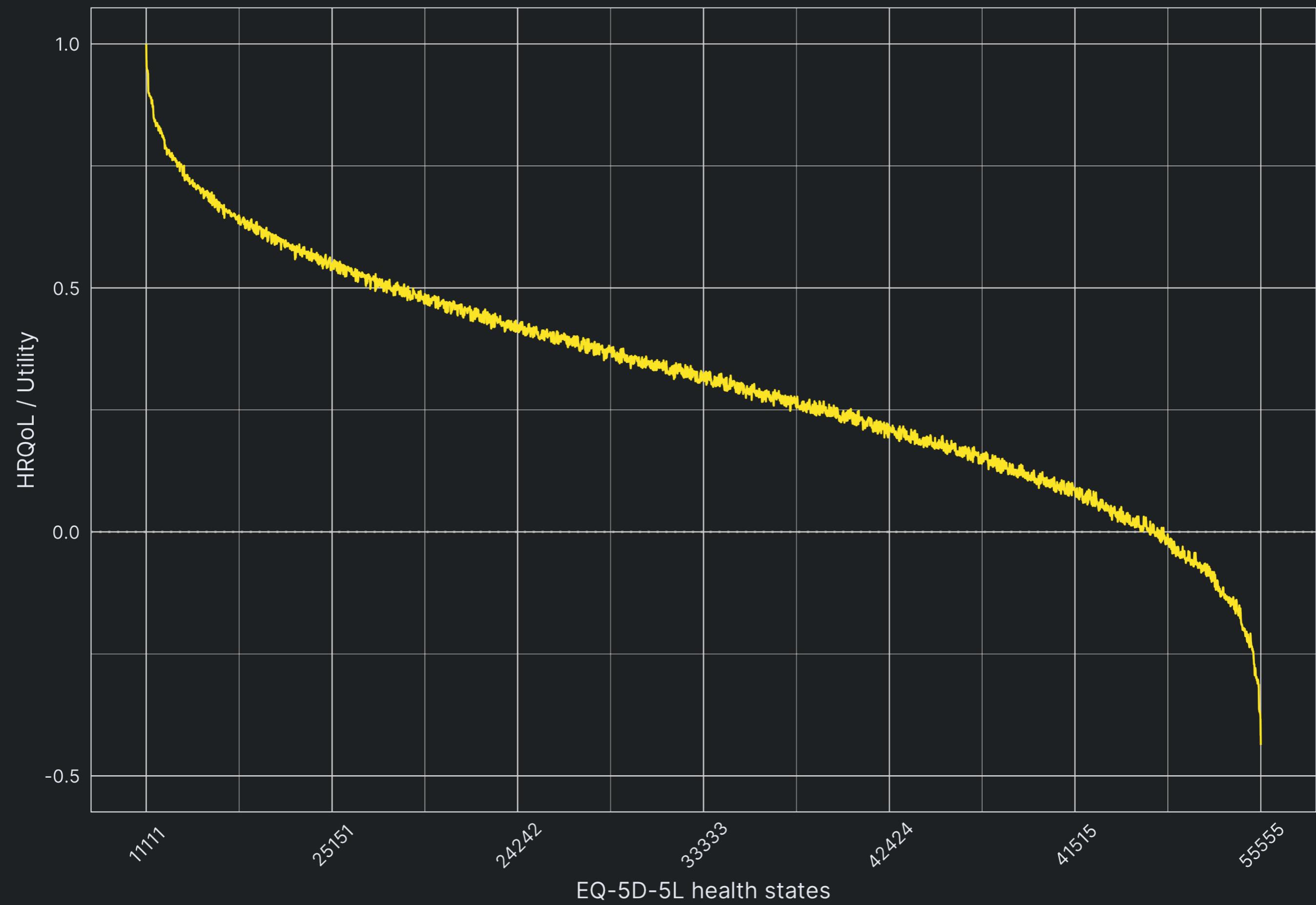
Social Tariff (n=874)

|	Mean (95%CI)
Mobility	
Lvl 2	0.055 (0.053; 0.059)
Lvl 3	0.123 (0.121; 0.130)
Lvl 4	0.213 (0.210; 0.223)
Lvl 5	0.283 (0.279; 0.296)
Self-Care	
Lvl 2	0.055 (0.054; 0.058)
Lvl 3	0.124 (0.122; 0.129)
Lvl 4	0.213 (0.210; 0.222)
Lvl 5	0.282 (0.278; 0.294)
Usual Activities	
Lvl 2	0.048 (0.047; 0.051)
Lvl 3	0.108 (0.106; 0.113)
Lvl 4	0.186 (0.184; 0.194)
Lvl 5	0.248 (0.245; 0.259)
Pain/Discomfort	
Lvl 2	0.060 (0.059; 0.063)
Lvl 3	0.136 (0.134; 0.141)
Lvl 4	0.234 (0.231; 0.243)
Lvl 5	0.309 (0.305; 0.322)
Anxiety/Depression	
Lvl 2	0.049 (0.048; 0.053)
Lvl 3	0.111 (0.110; 0.117)
Lvl 4	0.192 (0.189; 0.200)
Lvl 5	0.254 (0.250; 0.266)
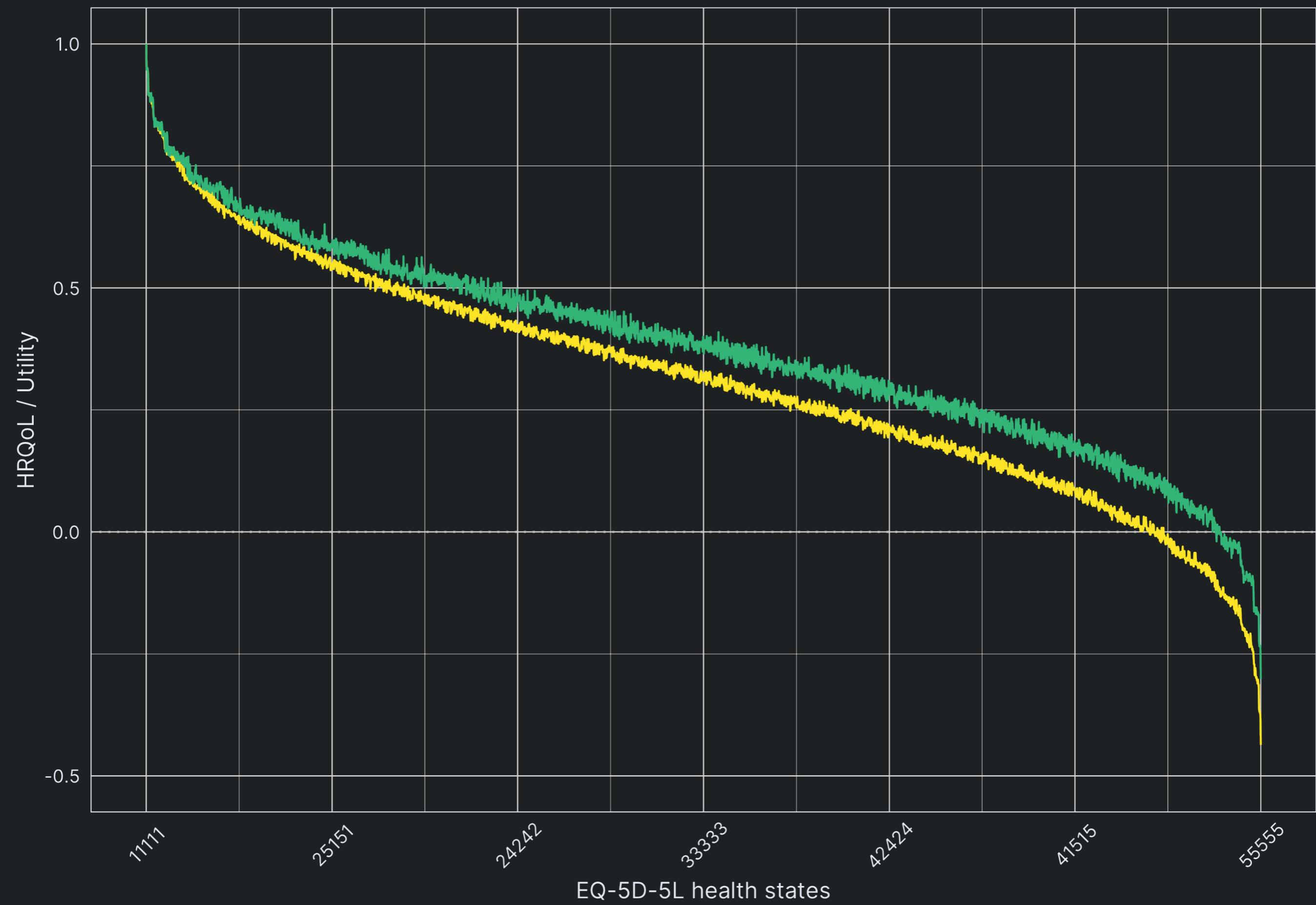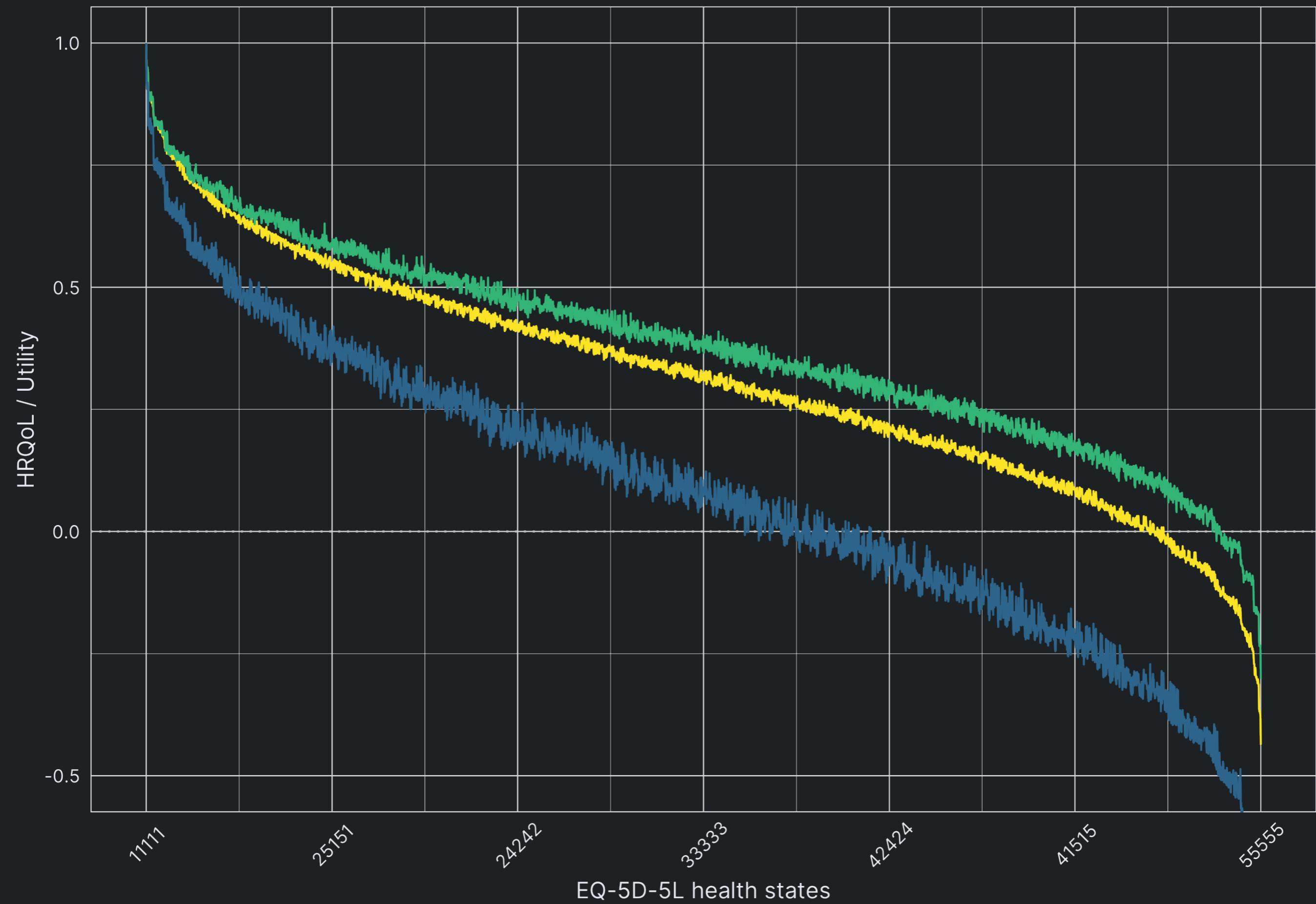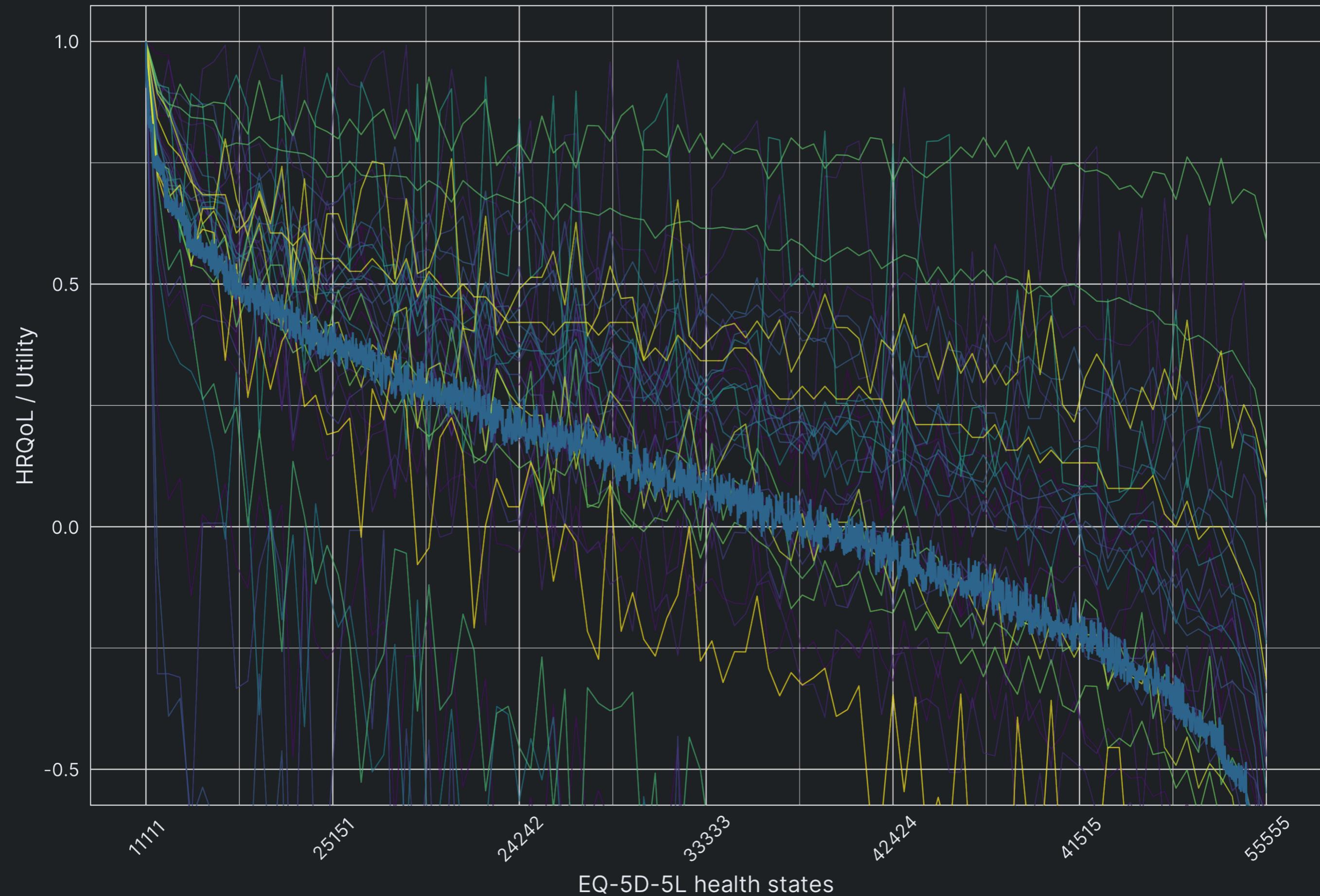
DCE Validation

Consistency overall: 78.5%

"Errors" per participant	
0	52% (453/874)
1	34% (299/874)
2	12% (101/874)
3	2% (21/874)

"Consistency" by difficulty	
Easy (>0.3)	82% (325/395)
Medium (0.2-0.3)	78% (200/257)
Difficult (0.1-0.2)	76% (227/299)
Hard (<0.1)	68% (143/209)

User Feedback

*"very interesting and very thought provoking"*

"an eye-opener"
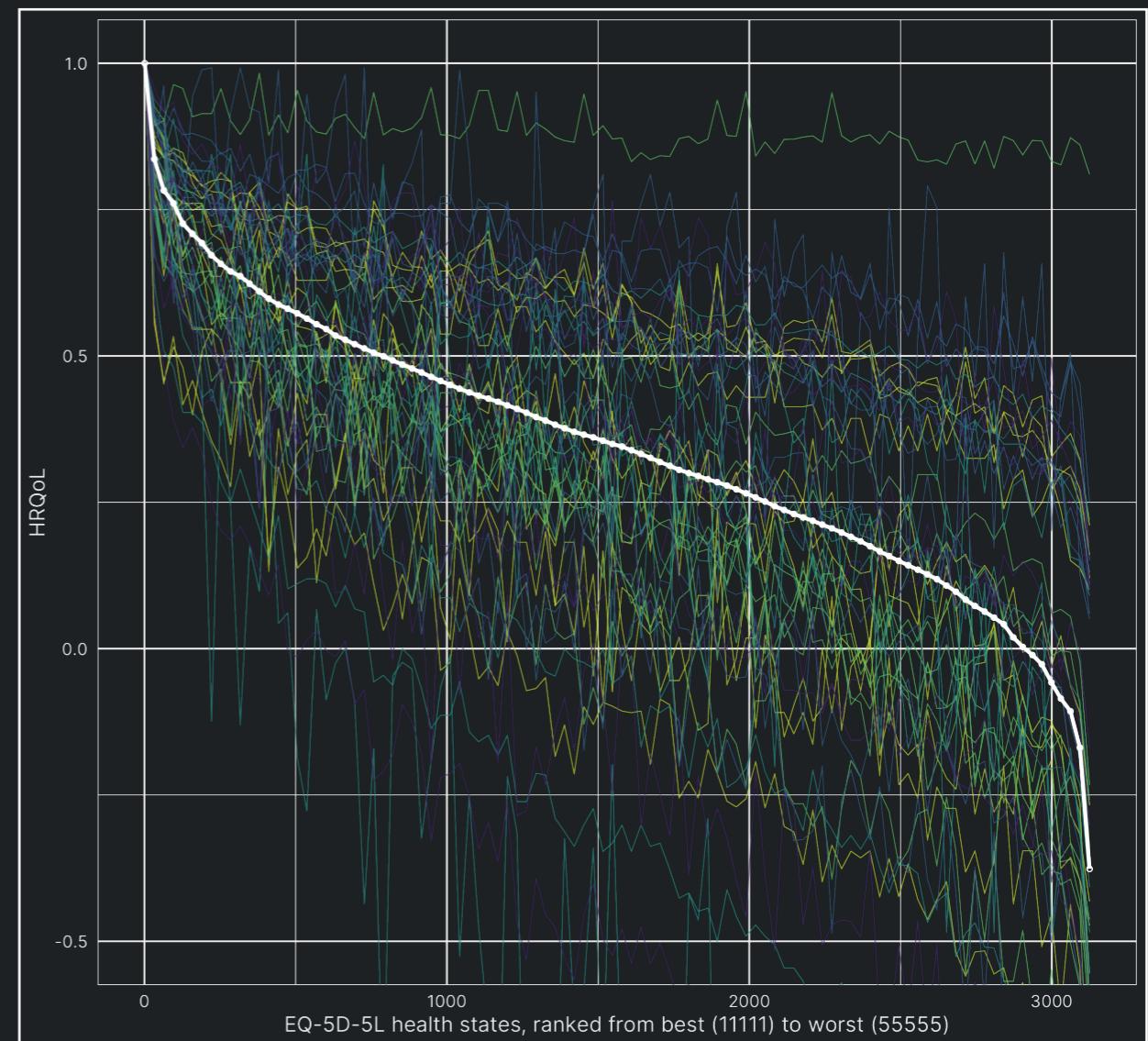
"I found this to be the best survey i have ever done, it was easy to follow thought provoking but highly enjoyable"

"[…] It certainly made me think and weigh up my answers. Thank you!"

"I found the survey interesting, and quite thought-provoking […]"

The OPUF Tool
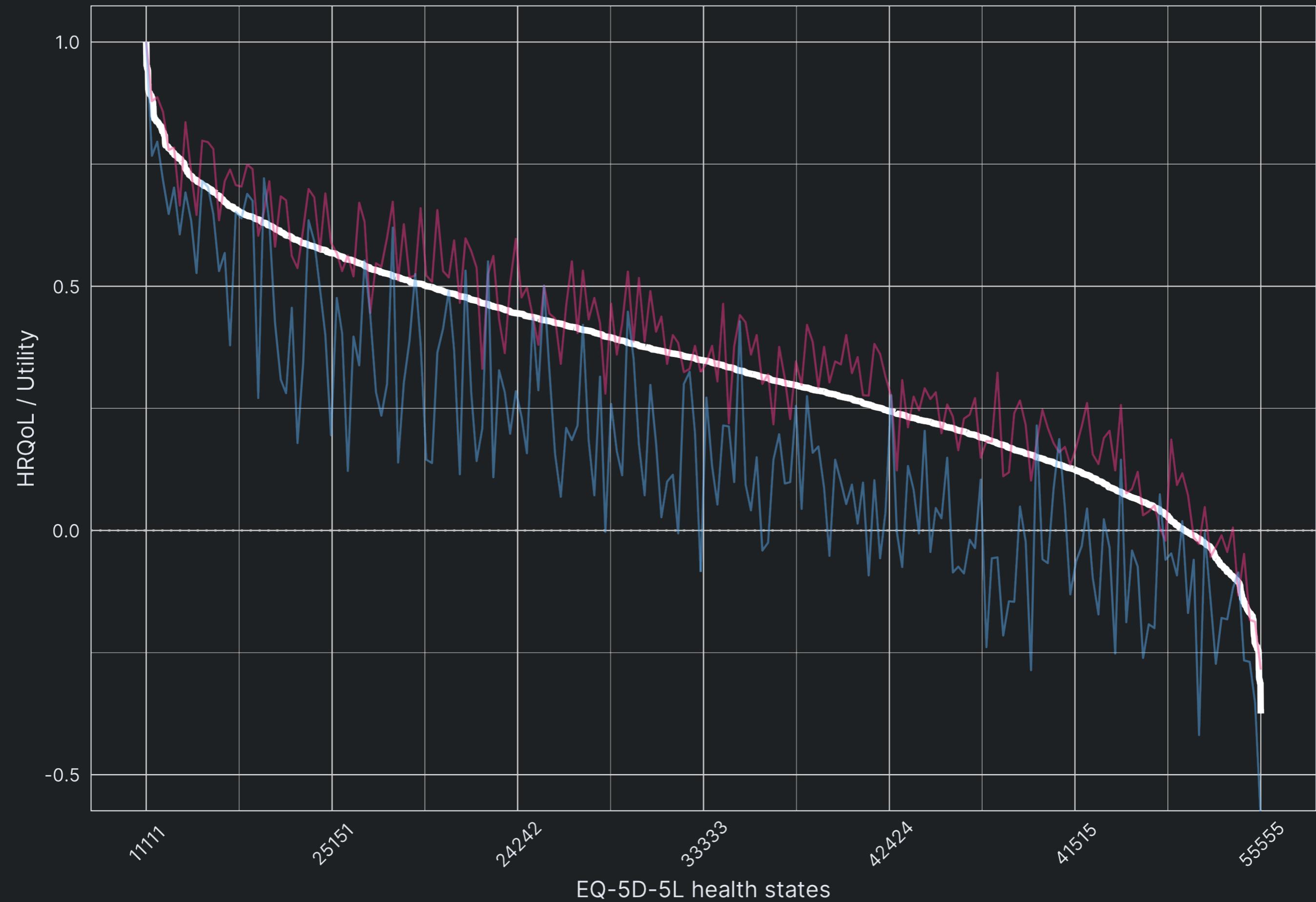
– Feasibility

– Efficiency

– Transparency

– Assumptions

– Acceptability

– Next steps?
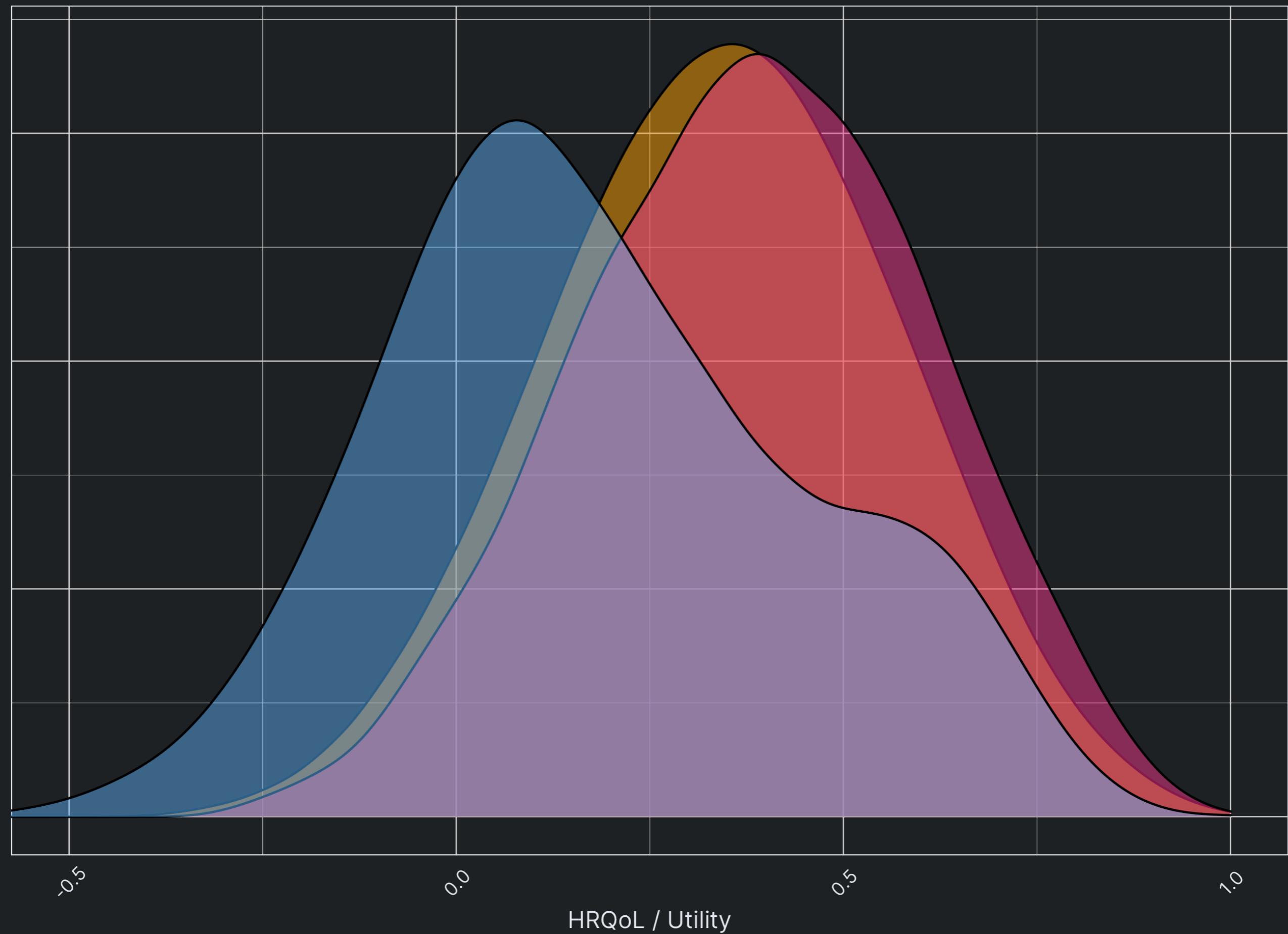
Thank you.
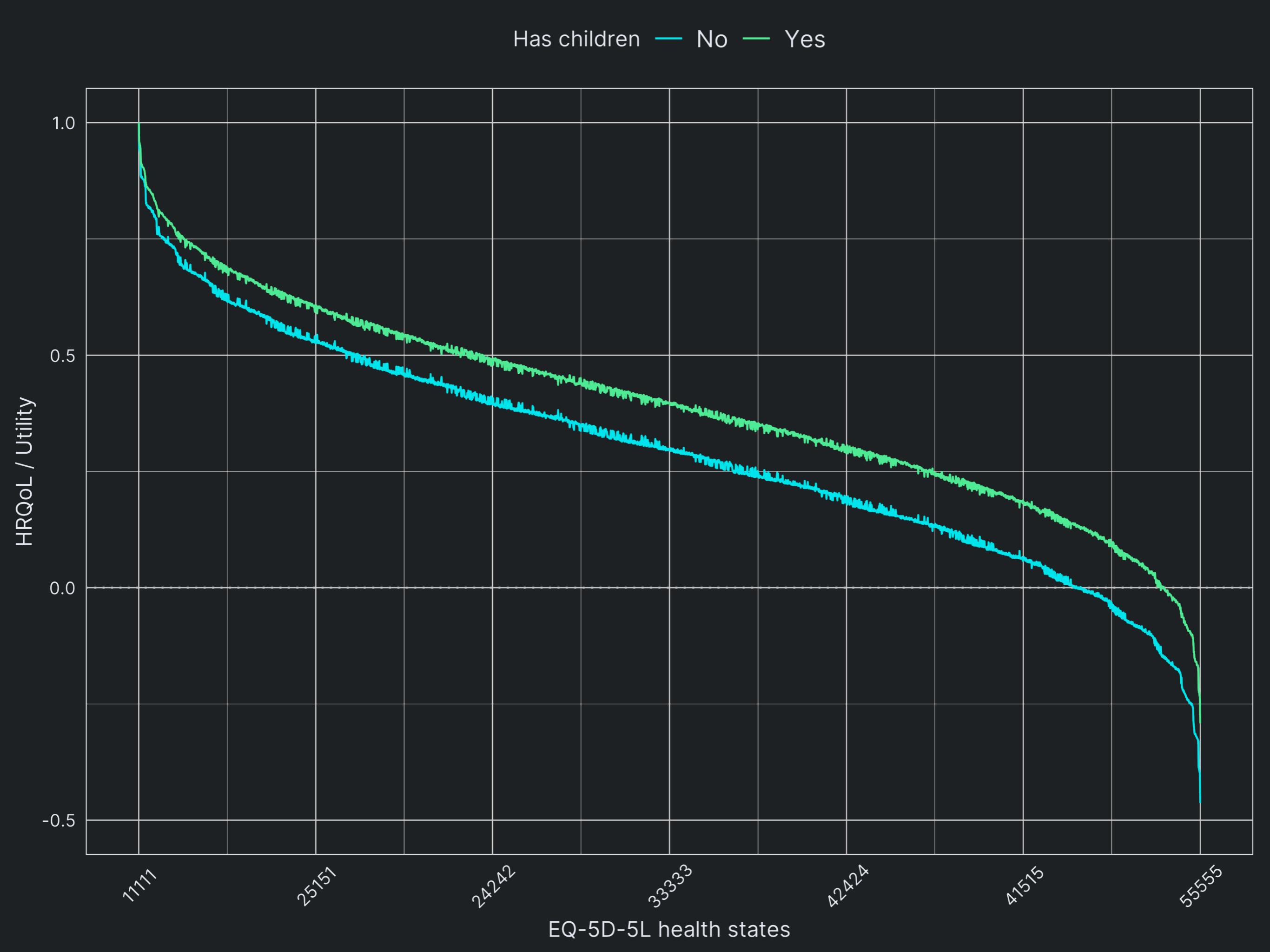
Supplement
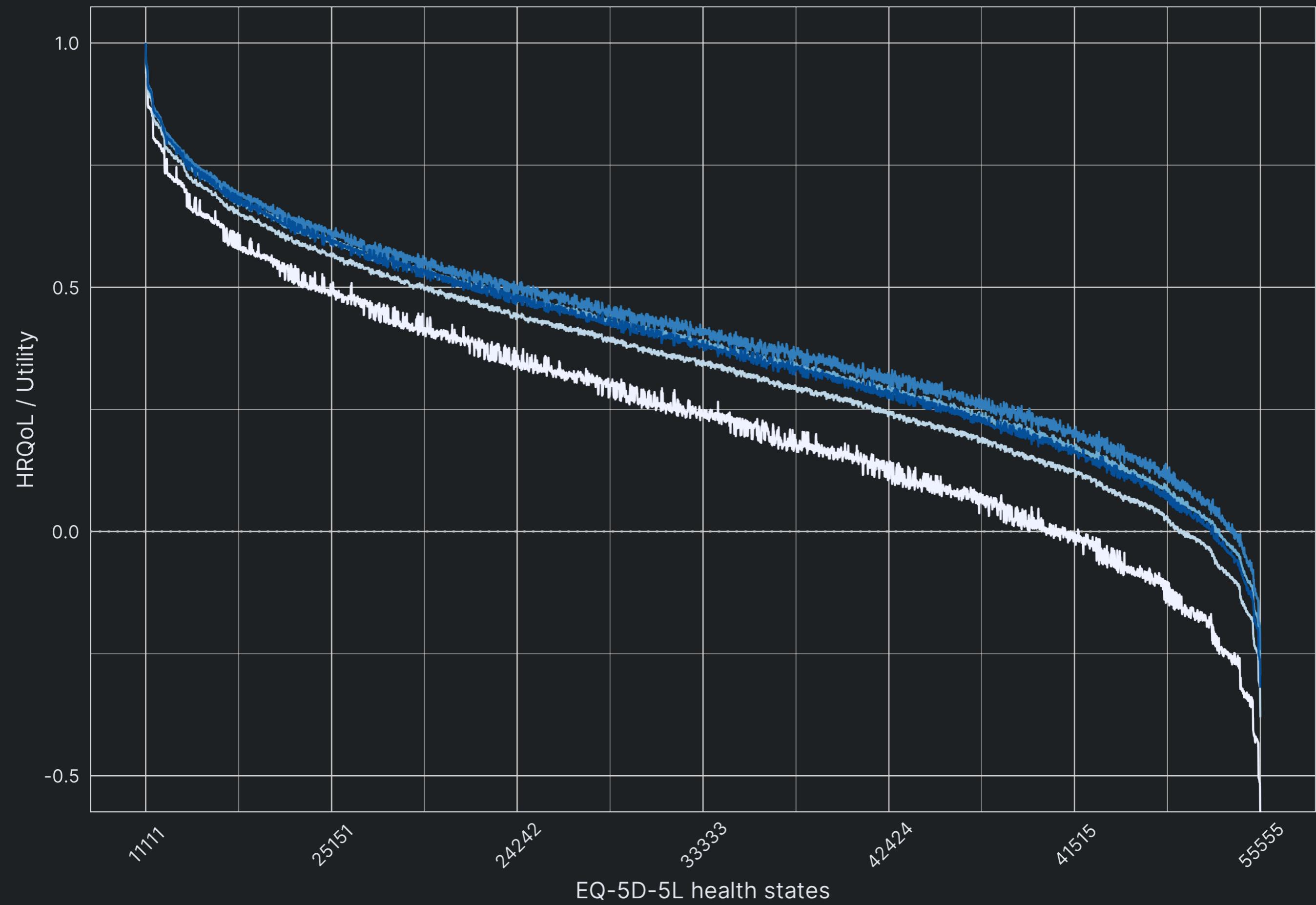
"Position of dead" task
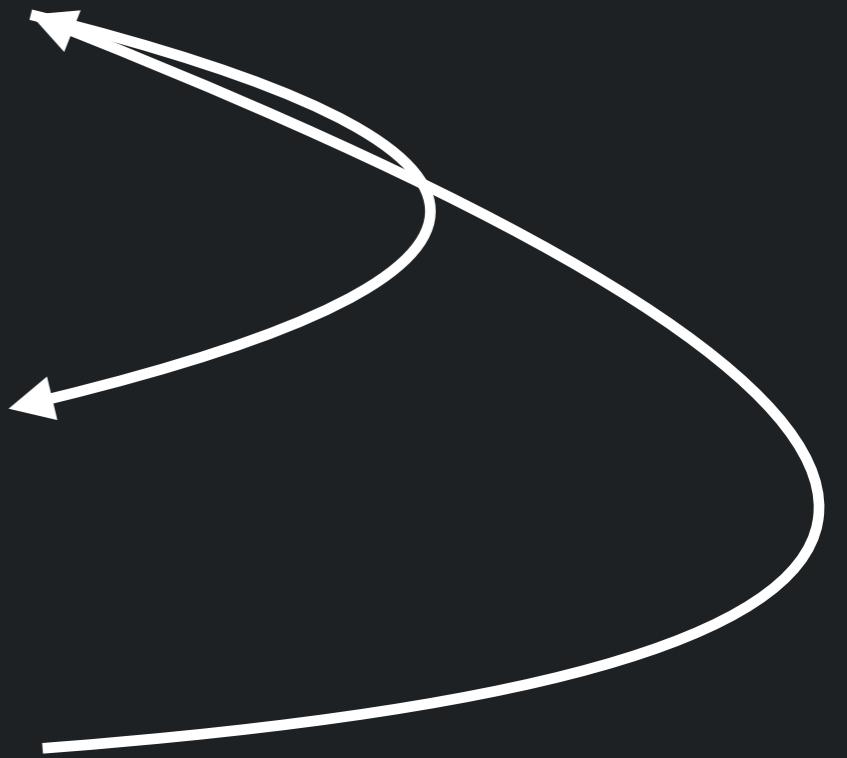
Rank	Health	Scaled
1	11111	1.00
2	11112	0.95
3	11211	0.90
4	21111	0.85
5	12111	0.80
6	12121	0.75
7	21212	0.70
8	22211	0.65
9	22112	0.60
10	22212	0.55
11	21222	0.50
12	12222	0.45
13	23111	0.40
14	32121	0.35
15	12321	0.30
16	22321	0.25
17	22323	0.20
18	33323	0.15
19	32333	0.10
20	13333	0.05
21	33333	0.00	⟵ ~ dead?

Rank	Health	Scaled
1	11111	1.00
2	11112	0.95
3	11211	0.90
4	21111	0.85
5	12111	0.80
6	12121	0.75
7	21212	0.70
8	22211	0.65
9	22112	0.60
10	22212	0.55
11	21222	0.50
12	12222	0.45
13	23111	0.40
14	32121	0.35
15	12321	0.30
16	22321	0.25
17	22323	0.20
18	33323	0.15
19	32333	0.10
20	13333	0.05
21	33333	0.00

Rank	Health	Scaled
1	11111	1.00
2	11112	0.95
3	11211	0.90
4	21111	0.85
5	12111	0.80
6	12121	0.75
7	21212	0.70
8	22211	0.65
9	22112	0.60
10	22212	0.55
11	21222	0.50
12	12222	0.45
13	23111	0.40
14	32121	0.35
15	12321	0.30
16	22321	0.25
17	22323	0.20
18	33323	0.15
19	32333	0.10
20	13333	0.05
21	33333	0.00

Rank	Health	Scaled
1	11111	1.00
2	11112	0.95
3	11211	0.90
4	21111	0.85
5	12111	0.80
6	12121	0.75
7	21212	0.70
8	22211	0.65
9	22112	0.60
10	22212	0.55
11	21222	0.50
12	12222	0.45
13	23111	0.40
14	32121	0.35
15	12321	0.30
16	22321	0.25
17	22323	0.20
18	33323	0.15
19	32333	0.10
20	13333	0.05
21	33333	0.00

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Rank	Health	Anchored
1	11111	**1.00**
2	11112	**0.92**
3	11211	**0.83**
4	21111	**0.75**
5	12111	**0.67**
6	12121	**0.58**
7	21212	**0.50**
8	22211	**0.42**
9	22112	**0.33**
10	22212	**0.25**
11	21222	**0.17**
12	12222	**0.08**
13	23111	**0.00**
14	32121	**-0.08**
15	12321	**-0.17**
16	22321	**-0.25**
17	22323	**-0.33**
18	33323	**-0.42**
19	32333	**-0.50**
20	13333	**-0.58**
21	33333	**-0.67**

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