

Utilitas

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Calibrating QALYs to Respect Equality of Persons

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Comparative valuation of different policy interventions often requires interpersonal comparability of benefit. In the field of health economics, the metric commonly used for such comparison, quality adjusted life years (QALYs) gained, has been criticized for failing to respect the equality of all persons' intrinsic worth, including particularly those with disabilities. A methodology is proposed that interprets 'full quality of life' as the best health prospect that is achievable for the particular individual within the relevant budget constraint. This calibration is challenging both conceptually and operationally as it shifts dramatically when technology or budget developments alter what can be achieved for incapacitated individuals. The proposal nevertheless ensures that the maximal achievable satisfaction of one person's preferences can carry no more intrinsic value than that of another. This approach, which can be applied to other domains of social valuation, thus prevents implicit discrimination against the elderly and those with irremediable incapacities.

INTRODUCTION

Current practice in health economics in measuring intervention effectiveness compromises equality by using an absolute standard of full health to which many cannot aspire. The challenge, set out in [section I](#), is to define an alternative metric that is flexible enough that it can be used to compare treatment outcomes across individuals with very different capacities to benefit. [Section II](#) proposes a solution involving calibration of gains to individuals' own maximal potential health prospect. In [section III](#), the adequacy of the QALY under the proposed calibration to its role in social decision-making is assessed, in particular the requirement of homogeneity of intrinsic social value. [Section IV](#) considers the practical implications and applicability of this approach to the assessment of health treatments in a way that respects equality.

I. THE EQUITY CHALLENGE

There is widespread consensus in the practice of health economics that allocative decisions can usefully be supported by cost-utility analysis, and that the quality adjusted life year (QALY) is an appropriate unit of health-related utility. To the extent that it represents an accurate measure of social value, the QALY enables fair comparison of the effectiveness of different interventions in a range of contexts, including the promotion of health, the prevention of illness and accident, the

40 cure and the palliation of ill-health. Its use acknowledges that health
 41 benefits can involve either extending life expectancy or enhancing
 42 quality of life or both, and that beneficiaries rationally trade these
 43 different aspects of health benefit.

44 In this methodology, the concept of quality of life is implicitly defined
 45 by the method used to elicit substitution rates between quality of life
 46 and its duration. The QALY gain or loss from an intervention for a
 47 representative patient is estimated through two distinct steps:

- 48 i. Health Prospect Description. The patient's *health prospect in the*
 49 *absence of intervention* is described, where a health prospect is
 50 the array of prospective *health states* with their probabilities of
 51 occurrence, and health states are characterized using a standard
 52 tool, such as the EuroQoL-5D. The EuroQoL-5D describes
 53 health states using five dimensions of health related quality
 54 of life: Mobility, Self-care capability, Ability to carry out usual
 55 activities, Pain/discomfort, Anxiety/depression. A health state is
 56 described by assessing whether it involves 'no', 'mild/moderate'
 57 or 'severe/extreme' problems on each of the five dimensions. (See
 58 www.euroqol.org/). Similarly, the patient's *health prospect*
 59 *with the intervention* is described. An intervention's effect is to
 60 move the patient from one health prospect to another.
- 61 ii. Health State Scoring. Each relevant health state is given a
 62 Health Related Quality of Life (HRQoL) score relative to full
 63 health, where full health is assigned a value of 1, and states
 64 equivalent to being dead are assigned a score of 0.

65 Taking account of duration and probability of each state in the array
 66 of states in the health prospects faced by an individual respectively
 67 with and without the intervention, the number of QALYs promised by
 68 an intervention can be derived. (Thus, a sure life extension of one year
 69 in full health generates 1 QALY, as does a certainty of raising someone
 70 in a health state with $HRQoL = 0.5$ to full health for two years.)

71 The assignment of different health states to HRQoL levels, step ii,
 72 is generally derived from a representative sample of members of the
 73 general public. It is here that the challenge to equality of human worth
 74 arises.

75 To assign a HRQoL to a specific health state, the sample of the general
 76 public is asked to respond as if they were in that state either to the
 77 question

78 What risk of death they would accept to achieve full health (this
 79 being the Standard Gamble, SG, elicitation technique)

80 or to the question

81 What proportion of their imagined expected life-term (usually
82 standardized for the exercise at ten years) would they forego in order
83 to achieve full health (this being the Time Trade Off, TTO, elicitation
84 technique).

85 The problem lies with the implicit interpretation of ‘full health’.
86 With a sample drawn from the general public, ‘full health’ is likely
87 to be interpreted as full psychophysical function. This is problematic
88 when applied to interventions that might benefit those with permanent
89 irremediable disabilities. So measured, the maximum possible health
90 gains for such patients, from interventions that necessarily only
91 partially mitigate disability or that extend life without addressing
92 disability, will fall short of what can be gained by those without
93 disability. Their health is capped at a level that will receive a HRQoL
94 score of less than 1; for thus are such disabled states scored by the
95 general public. Hence life extensions or best-possible cures for illnesses
96 for the disabled will be assigned fewer QALYs and thus less social value
97 than corresponding gains for the able-bodied.

98 The practice of health economics often appears to assume that in
99 the QALY we have a measure of a social good – health gain – that is
100 clearly of uniform intrinsic social value. (*Intrinsic* in contradistinction
101 to any extrinsic value that the health of an individual may bear, positive
102 or negative, for example in enhancing tax receipts, or in mitigating
103 inequality.) However, as currently calculated, the QALY is akin to a
104 physical measure of health gain; to turn it into one appropriate for
105 social valuation requires consideration of what contribution different
106 health improvements make to what is of intrinsic social value. This
107 issue is considered further in [section III](#); it plausibly makes reference
108 to *individuals’ own* rational aspirations for their lives (their welfare).
109 If that is right, use of *average* valuation is problematic.

110 The problem lies in the transfer of the valuation of a gain elicited from
111 one population group (the representative sample) to other groups (the
112 individual patients who will be the beneficiaries of the intervention).
113 Whilst benefit transfer, a common and very useful technique
114 in normative economics, inevitably ignores much heterogeneity,
115 systematic bias should be avoided. Transferring valuations from a
116 representative cross-section of the population for use in valuing benefits
117 for an irremediably disabled sub-section, involves systematic bias.

118 That use of standardized valuations to assess interventions for the
119 permanently disabled in health technology appraisal is problematic has
120 been widely recognized. And this critique has been used to discredit
121 cost-utility appraisals. An article in *The Lancet* put it thus:

122 The QALY outcome measure has problems. Even if a life-year in which a person
123 has impaired mobility is worse than a healthy life-year, someone adapted to

124 wheelchair use might reasonably value an additional life-year in a wheelchair
 125 as much as a non-disabled person would value an additional life-year without
 126 disability. Allocators have struggled with this issue.¹

127 Within the health economics literature, the problem has generated a
 128 strand of analysis and various proposals. No such proposal has yet
 129 found its way into general practice of health technology appraisal,
 130 which therefore remains vulnerable to the claim of systematic bias
 131 against the disabled.

132 The most straightforward proposal was offered by Eric Nord with
 133 colleagues:

134 [F]or states of chronic illness or disability that are preferred to death, all saved
 135 life years count as one.²

136 To resolve the issue, we have suggested that all life years gained by disabled
 137 people should count as 1...³

138 This proposal, which is termed by its authors the ‘equal value of
 139 life approach’ (EVL), is however only a partial solution, as it does not
 140 address the valuation of an intervention somewhat to raise the quality
 141 but not to extend the years of someone with a permanent disability.
 142 Once we decide to accord equal value to the life of the disabled, it
 143 becomes appropriate to assign full value to the maximal functional
 144 state of someone with a permanent disability and to value functional
 145 recovery to that state following an illness as full recovery.

146 Hence, to make the use of a QALY metric acceptable, an alternative
 147 understanding of Health Related Quality of Life is required, one
 148 that does not implicitly rate the lives of those with less than perfect
 149 psychophysical functional ability as inferior.

150 The challenge is complicated by the fact that those with disabilities
 151 are often stuck in health states from which others can gain from
 152 treatments; indeed, it is for the appraisal of such treatments that the
 153 HRQoL and QALY methodology is designed. Further, even those with
 154 disabilities that are currently untreatable could gain from conceivable
 155 treatments. From this perspective the apparent full recovery for the
 156 permanently disabled is not after all a truly full recovery.

¹ Govind Persad, Alan Wertheimer and Ezekiel J Emanuel, ‘Principles for Allocation of Scarce Medical Interventions’, *The Lancet*, vol. 373, issue 9661, 31 January 2009, pp. 423–31, at 427

² E. Nord, J. L. Pinto, J. Richardson, P. Menzel and P. Ubel, ‘Incorporating Concerns for Fairness in Numerical Valuation Of Health Programmes’, *Health Economics* 8 (1999), pp. 25–39, at 36.

³ E. Nord, P. Menzel and J. Richardson, ‘The Value Of Life: Individual Preferences and Social Choice: A Comment to Magnus Johannesson’, *Health Economics* 12 (2003), pp. 873–7, at 873.

157 This creates a dilemma in assignment of states to HRQoL: to respect
158 equality, we must accord all lives full worth; yet to motivate cure for
159 those with temporary disability, and to motivate the search for cure for
160 those with apparently permanent disability, we must recognize that
161 some health states are less good than others.

162

* * *

163 Before developing a technical solution to this problem in [section II](#) – one
164 which admittedly involves a degree of conceptual acrobatics – we should
165 address three alternative approaches that might be thought to dissolve
166 the problem: Dworkin’s proposal to select the basket of health treat-
167 ments through a hypothetical health insurance optimization; use of
168 equity weights to increase the valuation of treatments that benefit the
169 disabled; and adersion to elicited societal preferences regarding valua-
170 tion of interventions benefiting the disabled. Consider each in turn.

171 Suppose that health treatment appraisal is conceived from the
172 perspective of a healthy individual maximizing her potential welfare
173 in the face of a set of risks, and wishes to select the optimum basket
174 of health services so to do. Use of an absolute scale of psychophysical
175 function to appraise different treatments is in such a case appropriate
176 as no interpersonal comparisons are involved. Compare for example
177 a treatment that would give fourteen healthy years following a heart
178 attack and another treatment that would yield fifteen traumatic years
179 under treatment for cancer.⁴ If the risk of heart attack and the risk
180 of cancer are similar, and the pain and suffering attending the cancer
181 cure are unpleasant enough, it would be rational for someone to choose
182 to include the heart treatment rather than the cancer treatment in
183 the portfolio of treatments (assuming that she cannot afford both).
184 There is no required judgement of the relative value of the life
185 years of two different persons, respectively with cancer and heart
186 disease: for the comparison here is of the possible outcomes for one
187 individual.

188 In his ‘Justice in the Distribution of Health Care’, Ronald Dworkin
189 proposes the use of a thought experiment of this kind, in which a
190 society with an equitable distribution of resources chooses what basket
191 of health care services it should fund, as a guide to the basket of services
192 that should now be funded publicly (or mandated for social insurance
193 funding). He argues that

194 [W]e should aim to make collective, social decisions about the quantity and
195 distribution of health care so as to match, as closely as possible, the decisions

⁴ I am grateful to Richard Cookson for the challenge presented by this example, which is picked up again at the end of [section III](#).

196 that people in the community would make for themselves, one by one, in the
 197 appropriate circumstances, if they were looking from youth down the course of
 198 their lives and trying to decide what risks were worth running in return for
 199 not running other kinds of risks.⁵

200 Dworkin stipulates that for the experiment to work in guiding
 201 community choices, you must

202 [I]magine that no one in your community – including insurance companies – has
 203 any information available about the antecedent probability of any particular
 204 person contracting any particular disease or infirmity that he or she does
 205 not evidently already have. No one would be in a position to say, of himself
 206 or anyone else, that that person is more or less likely to contract sickle-cell
 207 anemia, or diabetes, or to be the victim of violence in the street, than any other
 208 person.⁶

209 It might be argued that the selection of treatments within a budget
 210 constraint so as to maximizemaximize expected QALYs calibrated
 211 relative to full psychophysical function is precisely what one would
 212 expect of someone ignorant of their particular set of health needs.
 213 Dworkin argues that nothing that that hypothetical society would do,
 214 ‘by way of health care arrangements, is open to objection on grounds
 215 of justice’ and ‘what they would do through independent decisions can
 216 serve as a guide to what we should do, in whatever way we can, to
 217 improve justice in our own circumstances’.⁷

218 However, Dworkin himself excludes from the ignorance stipulation
 219 to which his hypothetical purchaser of health insurance is subject only
 220 risk of ‘disease or infirmity that he or she does not evidently already
 221 have’. Hence, in drawing lessons from the hypothetical choices, we will
 222 still have to confront the challenge of designing a basket of services
 223 that would fit the choices of those with existing permanent disabilities
 224 as well as those who have none.

225 Dworkin does not spell out the rationale for thus suggesting that
 226 the disabled should choose with knowledge of their disability, but
 227 presumably it is that those who are actually disabled could otherwise
 228 deny the relevance of the thought experiment: they are not in a position
 229 to choose a basket of services that would have mitigated the risk of or
 230 the consequences of the disability from which they suffer, so it is unjust
 231 to insist that they respect the decisions that they might have made had
 232 they been in such a circumstance. If the community is to act on their
 233 behalf it must recognize that their conception of full health differs from
 234 that of others.

⁵ Ronald Dworkin, ‘Justice in the Distribution of Health Care’, *McGill Law Journal* 38.4 (1993), pp. 883–98, at 888.

⁶ Dworkin, ‘Justice in the Distribution of Health Care’, p. 889.

⁷ Dworkin, ‘Justice in the Distribution of Health Care’, p. 890.

235 Another response to the challenge is to stick with psychophysical
236 function as the interpretation of 'full health' but to attach additional
237 value to treatments that benefit those who are disadvantaged through
238 disability.

239 Use of such weights would be appropriate were the problem one of a
240 failure to move towards equality of outcome.

241 For egalitarian reasons it may be appropriate to compromise total
242 health gain in order to achieve a fairer distribution of health. But that
243 egalitarian question cannot even be posed without a prior assessment
244 of what health gain has and could be achieved for different individuals
245 using interpersonally comparable units. Calibration of health states
246 to respect equality of human worth is required to generate units
247 of uniform intrinsic social value. Hence, the problem is a failure
248 appropriately to calibrate health gain in a way that respects the equal
249 value of lives lived with disability.

250 A third possible route to addressing the challenge is to advert to
251 elicited societal preferences, using such preferences to overlay QALY
252 measurement with societal valuation of QALY gains in different
253 circumstances. Peter Ubel and colleagues attempt to address the
254 confrontation between the standard approach to QALY measurement
255 (described above) with 'a preference... for avoiding discrimination
256 against people who have limited treatment potential' as follows:

257 For example, suppose the public thinks that saving the lives of people with
258 paraplegia is equally as important as saving the lives of people who can be
259 returned to full health... saving the life of either group of patients [would
260 then] bring 1 QALY per patient [per year of life extension]. However, this
261 rescaling would also force us to conclude that people with paraplegia have the
262 same quality of life as people without paraplegia and that curing paraplegia
263 would not improve HRQoL. (No HRQoL is gained by 'improving' patients from
264 an HRQoL of 1.0 to an HRQoL of 1.0.)

265 Here is the attempted solution:

266 Suppose the societal value of program A [which cures 100 people of a life
267 threatening illness returning them to full health] is given an arbitrary value
268 of 1.0 [per patient]. Now suppose people think that program B, which saves
269 the lives of 100 people [who remain] with paraplegia, should receive the same
270 priority for funding as program A... Now suppose the same people think that
271 curing 600 patients of paraplegia (program C) is equally as important as saving
272 100 otherwise healthy people's lives (program A). Program C therefore has...
273 a societal value of 0.16 [per patient]....

274 What is the benefit of separating societal value from HRQoL measurement?...
275 the HRQoL brought by programs B and C (in conventional CEA [Cost
276 Effectiveness Analysis]) must sum to the number of QALYs brought by program
277 A (1 QALY [per person year]). However,... the societal value of programs B and
278 C add to 1.16.... We can now say that saving the lives of people with paraplegia

279 is equally as valuable as saving other people's lives while still acknowledging
280 that it is beneficial to cure people of paraplegia.⁸

281 The problem with this proposal is that it creates a paradox, which
282 the authors half-acknowledge:

283 Some may worry that the societal value approach to QALYs is inconsistent
284 because it allows the value of programs like B and C to sum to a value >1.
285 However, if society places the same value on saving the life of a paraplegic
286 and saving the life of a non-paraplegic and if society also values the cure of
287 paraplegia, then our suggestion is consistent with societal values.

288 The defence does not answer the worry that the advocated approach
289 is inconsistent. Consider how it would value a programme D, one that
290 was able to save the lives of those with paraplegia threatened by some
291 fatal illness and cure their paraplegia at the same time. Programme
292 $D = B + C$ in its effect, so should be valued at 1.16 per life year –
293 apparently making the programme more valuable than programme A
294 (which saved the lives of non-paraplegics), notwithstanding that both
295 programmes A and D leave their beneficiaries, who would all otherwise
296 die, with exactly the same HRQoL.

297 If the Ubel *et al.* scheme is inconsistent, then that it reflects society's
298 values merely shows society's values also to be inconsistent. Nord *et al.*
299 suggest that 'we may be forced to accept [such] inconsistencies rather
300 than impose a framework that clearly violates social preferences'.⁹
301 However, it is better to strive for an interpretation of citizens' expressed
302 preferences that is both consistent and free of ethical errors.

303 The paradox is dissolved by systematically distinguishing between
304 those whose incapacity is irremediable and those whose condition
305 is curable, in other words by calibrating health assessment to
306 beneficiaries' varying capacity to benefit.

307 II. CALIBRATING TO BEST ATTAINABLE HEALTH STATE

308 This section develops 'A Proposal to Solve the Comparability Problem in
309 Cost-Utility Analysis', by Bleichrodt, Herro and Pinto. They recognize
310 that valuation of health states should vary systematically with the
311 'attainable health state' of each individual:

312 The optimal solution . . . is to determine for each individual his set of attainable
313 health states and to elicit his health utility function, scaled such that the utility
314 of death is equal to zero and the utility of his best attainable health state is
315 equal to one. This scaling ensures that a year in the best attainable health

⁸ Peter A. Ubel, E. Nord, M. Gold, P. Menzel, J. L. Prades and J. Richardson, 'Improving Value Measurement in Cost-Effectiveness Analysis', *Med Care* 38 (2000), pp. 892–901.

⁹ Nord *et al.*, 'The Value of Life', p. 875.

316 state gets the same weight across individuals and avoids the possibility of
317 discrimination due to differences in capacity to benefit.¹⁰

318 But there is work to be done. First: how do we conceptualize this
319 scaling in the presence of uncertainty regarding attainable health
320 state? Second, what is attainable depends not only on technology but
321 also on budget. Third, taking this approach to avoid discrimination of
322 the disabled seems paradoxically to inhibit us from attributing a value
323 to possible mitigations of incapacity. And finally, what if those whose
324 prospects are very bleak – is individual scaling still appropriate?

325 My proposal involves four steps to address these issues:

- 326 (1) calibration to best health prospect (rather than health state),
- 327 (2) respecting the budget constraint of the particular budget holder
328 when assessing best health prospect,
- 329 (3) recalibration when changes in technology or budget expand (or
330 constrict) the prospects achievable,
- 331 (4) exempting from calibration to best health prospect lives of little
332 quality and all consideration of duration.

333 (1) *Calibrating to personal best health prospect*

334 When estimating the value of health interventions that shift
335 individuals from one prospect to another, calibration to best attainable
336 health permits sensitivity to the varying capacity to benefit of different
337 individuals. However, as treatment decisions are essentially forward-
338 looking, and as health outcomes are probabilistic, it is important that
339 calibration is to a best attainable health *prospect* rather than a best
340 attainable health *state* (a departure from the Bleichrodt *et al.* proposal).

341 We adopt:

342 *Principle One: calibration to personal best attainable health prospect.* In the
343 assignment of cardinal values to individuals' health prospects (Health Related
344 Quality of Life $HRQoL_{hp}$) for each relevant future period for the purpose of
345 comparative appraisal of possible interventions, where a prospect is an array
346 of possible health states hs each associated with a probability p_{hs} such that
347 $\sum p_{hs} = 1$:

- 348 • the value zero is assigned to the health state of being dead,
- 349 • the value 1 is assigned to the best health prospect achievable by that
350 person for that period, where health prospects are ordered according
351 to the individuals' own rational preferences,
- 352 • intermediate values are assigned to a health prospect hp for a period,
353 according to individuals' rational indifference between hp and a

¹⁰ H. Bleichrodt, C. Herrero and J. L. Pinto, 'A Proposal to Solve the Comparability Problem in Cost-Utility Analysis', *Journal of Health Economics* 21 (2002), pp. 397–403, at 398.

354 prospect involving a probability HRQoLhp of best attainable health
 355 prospect and a probability (1- HRQoLhp) of death,
 356 • HRQoLhp is then a coefficient applicable to the duration of the
 357 affected temporal parts of individuals' health prospects with/without
 358 an intervention, thus generating a QALY gain or loss attributable to
 359 the intervention, e.g. a 0.5 gain in HRQoLhp for a period of a year
 360 would represent a $\frac{1}{2}$ QALY gain.

361 Hence, for somebody with both a remediable and an irremediable
 362 condition, a best attainable health prospect for that person is defined
 363 to remedy the remediable but to include the irremediable condition.

364 Consider first appraisal of a screening programme to mitigate the
 365 risk of a life-threatening condition. To avoid discrimination against
 366 people with disabilities, the assessment of quality of life used in
 367 calculating incremental QALYs conferred by the screening programme
 368 must be calibrated to the best health prospect that is available to
 369 each person affected. The years that are in jeopardy from the life-
 370 threatening disease are full value years even if they will be enjoyed
 371 by someone whose maximum gain cannot include sight, no technology
 372 being available that can restore sight.

373 Now, consider the position of a person whose blindness is curable.
 374 Attainment of sight is attainable for this person, so we should assess
 375 her options against this standard. Her blindness is not part of her
 376 endowment but a condition for which she seeks treatment, and hence
 377 we should calibrate other prospects against a health opportunity set
 378 that includes a chance of full sight.

379 Suppose this second blind person suffers from cataracts that can
 380 be removed, but the operation has not yet occurred. Suppose she is
 381 also at risk of developing a life-threatening condition. Is screening her
 382 to mitigate this risk as valuable as screening a sighted person? Yes,
 383 but it is less cost-effective, for two procedures are required to achieve
 384 the same outcome (sight with mitigated risk). The fact that a given
 385 health prospect for some people involves more cost than for others is
 386 incontrovertible and should properly inform appraisal.

387 (2) *Respecting the budget constraint*

388 Suppose the same scenario arises with a blind person whose blindness
 389 is technically curable but for whom the budget is not available to cure
 390 her: perhaps the cure for this person's type of blindness falls above the
 391 cost-effectiveness threshold consistent with the budget constraint.

392 If the budget constraint is binding, it is just as real a constraint as the
 393 technological limit. Hence, this person's life years with blindness should
 394 be attributed intrinsic social value equal to the person whose blindness
 395 is technically incurable. So, in our example, it should be considered as

396 cost-effective to screen her for a life-threatening condition as to screen
397 a sighted person.

398 Hence, we must accept:

399 *Principle Two: maximal individual health prospect is defined with*
400 *reference to any binding budget constraint.* In the assessment of the
401 maximum health prospect achievable by an individual, the maximum
402 is defined not only by technological limits but also by the budget
403 constraint, assuming that the budget constraint is truly binding.

404 Note that the principle that individuals' best attainable health
405 prospects are determined by taking account of the budget constraint
406 applies only if the budget constraint is actually binding. If there is
407 resource allocated to some other activity which can be reallocated into
408 health, then that assumption does not hold, and the allocation between
409 that other good and health must be set using some metric of value that
410 encompasses both health and whatever good is realized by the other
411 budget.

412 If a thousand pounds becomes available to the health budget, it
413 should be used to fund those interventions that would maximize the
414 calibrated QALYs gained. Amongst interventions that only improve
415 quality of life without affecting longevity, the best intervention for an
416 individual is the one that minimizes the HRQoL that that individual
417 would *then* have reason to assign to their current health prospect.

418 Budgetary resources should be displaced from elsewhere just in case
419 the social value that they are realizing in that alternative use falls
420 short of the social value of the QALYs that would be created by their
421 best health use.

422 Whose budget constraint should be applied? Budgets are particular
423 to budget holders, and budgets are governed by decision-making
424 individuals and protocols. The best attainable health prospect for a
425 beneficiary will therefore vary with the resources available to the
426 decision maker for that use.

427 Compare, for example, the relative valuation of different
428 interventions carried out by an aid agency to the valuation carried
429 out by officers of the impecunious health system that the aid agency
430 wishes to support. The latter is forced to take as fixed incapacities that
431 from the perspective of a wealthier donor are properly seen as ailments
432 requiring cure.

433 This gives us:

434 *Principle Three: The budget constraint that defines beneficiary's best*
435 *attainable health prospect is that of the current decision-maker.*
436 Therefore, each funder of health care allocating its budget so as to
437 maximize health gain must regard any unaffordable improvement of

438 health condition as an incurable condition not detracting from the
439 value of the lives afflicted.

440 Decision-making in a publicly funded health service, however, is
441 complex: budgets are distributed across many different levels, and the
442 hardness of these budget constraints is often not clear. This may require
443 a decision-maker locally to countenance two conflicting perspectives:
444 on the one hand prioritizing locally on the assumption that the budget
445 is fixed, on the other making the case for budget expansion from an
446 understanding of what health gains could be achieved were the budget
447 restraint relaxed.

448 (3) *Recalibration to best health prospect when changes in technology*
449 *or budget expand (or constrict) the prospects achievable*

450 Suppose a technology emerges that would allow a particular form of
451 blindness to be corrected cost-effectively, the attainable quality of life
452 of those suffering from that form of blindness shifts upwards, and
453 it is correct to attribute value to the improvement of their lives to
454 that higher level. Potential gains of quality of life are thenceforward
455 reckoned as a proportion of the attainable quality of life including the
456 innovation.

457 Yet if the new technology is assessed to be cost-ineffective, the current
458 lives of that group continue to be viewed (e.g. in assessing other
459 interventions from which they might benefit) as of full quality.

460 The appearance of paradox arises because we fail readily to grasp
461 the radical shift in the status of the persons affected that occurs if the
462 innovation is accepted – from one of disability-demanding-respect to
463 one of affliction-demanding-treatment. A member of such a group is
464 now unable to realize her potential without intervention, because her
465 potential in life has expanded. Existing treatments become inadequate
466 to her need.

467 We may wish to say that the innovation of an affordable cure was
468 there all the time – awaiting discovery, and we merely underestimated
469 the potential quality of life of those afflicted by the condition. With
470 adoption of the innovation, it turns out that that was the true maximum
471 prospective quality of life. Such an account would explain why we
472 attribute value to the discovery itself.

473 A similar shift occurs when a budget expansion renders an existing
474 treatment affordable – or, in reverse, if a budget contraction forces
475 out of the basket of interventions an existing marginally cost-effective
476 treatment.

477 (4) *from calibration to best health prospect lives of little quality and*
478 *all consideration of duration*

479 Two objections to the proposal to calibrate quality of life to maximum
480 potential function should now be addressed:

- 481 • The implications become counter-intuitive when applied to those with
482 very low potential quality of life.
- 483 • The proposal responds to alleged discrimination against the disabled.
484 But the QALY approach to measuring benefit is open to a similar
485 objection on behalf of those who have less than average life
486 expectancy.

487 We will consider each issue in turn.

488 Suppose someone is in a permanent vegetative state and the
489 possibility emerges to restore to them some minimum level of brain
490 function still short of consciousness. To the extent that that represents
491 the maximum function that can be attained for such a person, it might
492 seem to follow from the equality of persons that such an intervention
493 should be reckoned as if it were conferring full quality of life.

494 To avoid this outcome, we could stipulate a minimum level of mental
495 function as delimiting the ambit of the principle of equality. Social value
496 might be thought to inhere in the existence or the doings of ethical
497 persons, and there is philosophical space to deny ethical personhood to
498 those lacking basic mental function. Whilst there may be separate and
499 powerful ethical reasons to attribute value to the lives of the comatose,
500 the demented and to tiny infants in most contexts, conditionality upon
501 personhood shields from absurdity the proposal to calibrate maximum
502 HRQoL level to the individual's best attainable health prospect when
503 appraising interventions.

504 Conditionality upon personhood is in turn supported by a minimal
505 substantive understanding of what gives life its equal potential value.
506 To avoid conditioning valuation upon one particular theory of life's
507 value, calibration for equality aims to value improved psychophysical
508 function according to the importance that individuals themselves would
509 attribute to it. (Calibrating against an average citizens' assessment, by
510 contrast, would implicitly ignore the potential of someone with some
511 disability to find a distinctive yet equally valuable use for the time
512 that they have available to them.) There is nevertheless a minimum
513 level of functioning beneath which neither experiences nor activities of
514 value are conceivable. The permanently comatose are capable of neither
515 experiences nor activities of intrinsic value.

516 A more demanding minimum is set by Nord *et al.* in qualifying the
517 Equal Value of Life proposal mentioned in [section I](#): "To resolve the
518 issue, we have suggested that all life years gained by disabled people
519 should count as 1 *as long as the health state in question is preferred to*

520 *being dead by those concerned.*¹¹ In some communities where a suicide
 521 wish is reckoned reasonable (rather than the product of a distress that
 522 observers may hope will prove temporary), intervention to prevent it is
 523 not thought appropriate. It is no doubt with such situations in mind that
 524 Nord *et al.* proposed the limitation to their EVL rule. The important
 525 point here however is that some lower limit is plausibly consistent with
 526 the principle of equality.

527 In [section III](#), intuitions regarding our proposal at this difficult
 528 borderline are tested against an example.

529 Regarding the second issue, are we bound by the principle of equality
 530 also to calibrate potential gain in years of life to the maximum potential
 531 years of life available to each person?

532 Though such calibration would be technically feasible, the results
 533 would be strikingly counterintuitive.

534 Suppose of two patients facing a small risk of death, small enough
 535 that this is not a risk from which rescue is demanded (given that rescue
 536 creates its own ethical demands), the life expectancy of one of the
 537 patients is dramatically shorter: she has only a day or two to live before
 538 she will die from a pre-existing condition. It is apparent that an inter-
 539 vention to reduce the small risk of immediate death is more valuable
 540 for the person with greater life expectancy. And the reason is this: the
 541 capacity for experiences and activities of value is broadly proportionate
 542 to time; the doctrine of equality thus lacks plausibility over this dimen-
 543 sion. Whether there is strict proportionality between time granted and
 544 value of life is less obvious, as we will discuss in the next section.

545 III. THE ROLE OF QALYS IN SOCIAL DECISION-MAKING

546 QALYs play a particular role in social decision-making: they represent
 547 units of impact that bear constant intrinsic social value, such that
 548 when appraising different options, an option yielding twice as many
 549 QALYs will yield twice as much intrinsic social value. In this [section I](#)
 550 first focus upon the theoretical requirements for value-homogeneity of
 551 the QALY metric. I then test the proposal against intuitions regarding
 552 minimal quality of life and the displacement of treatments delivering
 553 higher relative quality of life.

554 As Sen points out, to allow interpersonal comparisons of levels and
 555 of increments, achievement of social value must be susceptible to
 556 measurement for each individual on a ratio scale, and the origin of
 557 the scale must be non-arbitrary.¹²

¹¹ Nord *et al.*, 'The Value of Life', p. 873.

¹² A. Sen, 'Interpersonal Comparisons of Welfare', essay 12 in *Choice, Welfare and Measurement* (Cambridge, MA, 1982), see particularly sec. 4, 'Comparability Types: Formal Structures'.

558 Sen suggests a possible zero: ‘The interpretation [of ‘the “origin”
559 of a person’s welfare function’] may be to identify a distinguished
560 point below which misery dominates . . .’. He notes however that ‘other
561 interpretations are possible’. It is natural to identify this ‘origin’ with
562 the zero point on the HRQoL scale described in [section I](#). This zero is
563 commonly associated with ‘death’ rather than with ‘misery’, but death
564 is actually inappropriate as an interpretation, being an event rather
565 than a state, and irreversible. Sen’s ‘misery’ suggestion may be more
566 helpful, understood, under the SG methodology, as a level of pain or
567 other affliction such that there is no risk of death a person would be
568 unwilling to accept to recover from a prospect in which that state is
569 endured indefinitely.

570 In order to discharge a commitment to the equality of human worth,
571 the intrinsic social value attributed to any individual’s welfare should
572 also be scaled to a common maximum value for any given duration. (Re-
573 garding a maximum, Sen refers briefly to the possibility of prohibiting a
574 set of welfare functions for interpersonal comparisons ‘that “blows up”
575 the welfare function of one person arbitrarily keeping those of others
576 unchanged’.) This ceiling on the intrinsic social value of individual
577 welfare can be identified with the ceiling on the HRQoL scale, HRQoL
578 = 1, attributable to any individual’s best attainable life prospect.

579 It might be objected that even a person enjoying their best attainable
580 health prospect may yet lack adequate resources to flourish. Neverthe-
581 less, we can call in aid the point established in [section II](#) that calibration
582 to maximum potential is relative to what is achievable by the budget-
583 holder conducting an appraisal, and is thus subject to the resources at
584 their disposal. For the allocator of healthcare resources, the allocation
585 of other resources is taken as a given, so for that budget holder there
586 is an equivalence between HRQoL and Quality of Life *tout court*.

587 Indeed, this approach is not limited to healthcare decision-making.
588 The methodology outlined in [sections I](#) and [II](#) makes no essential
589 reference to health: for decision-makers with other interventions in
590 their portfolio, health states, health prospects and attainable health
591 states can be displaced by more general concepts of welfare. Individuals’
592 conceptions of what lends value to their lives, whether health or
593 education or other goods, are incorporated into the methodology for
594 assigning quality of life levels to different life states and life prospects
595 relative to best attainable life prospect.

596 Sen, in his championing of an ethically broad-based measure of
597 success in social policy, focuses upon ‘individual capabilities to do things
598 that a person has reason to value’.¹³ At least without fitting to it the

¹³ A. Sen, *Development as Freedom* (Oxford, 1999), p. 56.

599 formal restrictions suggested above, the capability approach is open to
 600 an elitist interpretation, one that values the societal sum of capability
 601 calculated employing absolute measures of functioning. To insist on a
 602 maximum level of capability that is attainable is to deny the validity
 603 of perfectionist accounts of human worth. Notwithstanding that we
 604 may be confident that Jack will flourish less than Jill upon any and
 605 every objective scale, we take it as axiomatic that the social value
 606 of enabling Jack to flourish as much as he possibly can for a year
 607 is of no less value than doing the same for Jill. This is interestingly
 608 consistent with Jack actually wasting what opportunity he is given.
 609 The principle of equality applies in prospect not in retrospect – but the
 610 decision contexts with which we are dealing do not require retrospective
 611 comparison.¹⁴

612 This proposal is not to be understood as a compromise to meet
 613 egalitarian or fairness concerns, for we lack an alternative ethically
 614 tolerable metric of interpersonal value comparison. Rather it is
 615 intrinsic to our understanding of value that the social value of any
 616 individual's life prospect is of no more value, year for year, than any
 617 other's. To respect this intuition regarding valuation we therefore insist
 618 on calibrating welfare against a scale that not only has a significant zero
 619 but also has a significant maximum, set at the individual's maximum
 620 achievable and affordable welfare prospect.

621 The social value of welfare must be measured in units that have a
 622 time dimension as well as a magnitude at a time. Elsewhere I have
 623 argued that a year's gain in life expectancy (a statistical life year) is
 624 an attractive interpersonally comparable measure of roughly constant
 625 intrinsic social value, notwithstanding that the lives vary in longevity.¹⁵
 626 But to use the QALY as a measure of homogeneous intrinsic social value
 627 is to assign equal value to each of a person's prospective life years at best
 628 attainable health, as well as equal value to the life years of different
 629 people.

630 Assessing aggregate value by integrating over duration is
 631 inconsistent with John Broome's contention that time is not separable
 632 in the social value function.¹⁶ However, separability of times, like
 633 separability of persons (for which Broome argues), is a simplification
 634 that may be adequate to certain decision contexts, though not to
 635 others. Broome is correct that it is not adequate to a context in
 636 which decisions are being taken that might affect the age structure
 637 of a whole community. For other questions, perhaps dealing with

¹⁴ Donald Franklin, *Groups in Conflict: Equality versus Community* (Cardiff, 2008), see particularly ch. 1: 'The Doctrine of Equal Human Worth', pp. 20-9.

¹⁵ Donald Franklin, 'Valuing the Time of Your Life' (under review).

¹⁶ John Broome, *Weighing Lives* (Oxford, 2004), ch. 7.

638 sustaining communal institutions such as the family, separation of
639 persons will also be inadequate. Nevertheless, for social decision-
640 making in the contexts here under consideration (the allocation of
641 healthcare resources, and similar goods and services affecting the
642 quality of the lives of existing groups), a reasonable simplification is
643 to extend equal concern to each period of a person's life.

644 Let us now test this proposal against challenging scenarios involving
645 lives whose maximum health prospect even with best treatment is of
646 low quality, and whose treatment will displace that of individuals with
647 better prospects.

648 Imagine a condition that leaves its sufferers fully conscious, but in
649 a very poor physical condition. Suppose that this condition is rated
650 as preferable to being dead (or that the choice of being dead in this
651 community is not available). Now a treatment becomes available that
652 would improve quality of life to a very small, but real, degree, but
653 only at such an expense that it would only be reckoned affordable
654 if the improvement were calibrated in the way discussed such that
655 the improved state is deemed full health for this group (HRQoL = 1).
656 To fund such treatment might displace treatments from others whose
657 quality of life would be much higher subsequent to treatment at only
658 slightly higher cost per year of benefit. Can funding the treatment
659 nonetheless be justified?

660 For example, suppose the condition leaves sufferers in almost
661 constant severe pain – but with regular remissions of average
662 duration of fifteen minutes per day. Suppose the proposed treatment
663 could increase the period of remission to one hour. Suppose that
664 a conventional assignment of HRQoL levels to these two health
665 prospects – respectively without and with the treatment to extend
666 remission periods – would generate assignments of 0.025 and 0.1
667 (assuming for simplicity proportionality of life value with time in
668 remission). That is to say that a representative sample of the general
669 public would be willing to take a 97.5 per cent risk of death to avoid the
670 untreated prospect if the alternative were full psychophysical health,
671 and that they would be willing to take a 90 per cent risk of death to
672 avoid even the with-treatment prospect (to use the Standard Gamble
673 interpretation of the assignment of health prospects to HRQoL levels
674 described in [section I](#)).

675 Four years with this condition would conventionally generate only
676 one tenth of a QALY ($0.025 \times 4 = 0.1$), and the treatment would raise the
677 tally to 0.4 QALY ($0.1 \times 4 = 0.4$) – a gain of 0.3 QALY. With calibration,
678 however, we would scale to the maximum achievable quality of life for
679 this group – which is the prospect with the treatment. To those with
680 this condition, suppose we elicit a willingness to take a risk of death of

681 75 per cent to get the benefit of the treatment and to avoid the prospect
682 of remissions remaining at only fifteen minutes per day. From which
683 we infer that, from the perspective of this group, the treatment raises
684 HRQoL from 0.25 to 1, generating $\frac{3}{4}$ QALY each year, three QALYs
685 over four years.

686 Under the calibration-for-equality proposal, therefore, this treatment
687 would be judged affordable in preference to one of equal per capita
688 cost that generated an expected additional thirty-five months in full
689 psychophysical health to some other group, e.g. through mitigation of
690 a lethal heart condition.

691 Is it reasonable to attribute such a high value to a treatment that
692 leaves sufferers in such a miserable condition?

693 Note first, remembering Dworkin's insurance proposal, that if the
694 chronic pain condition is merely one to which the general population
695 is at risk, alongside the risk of heart disease, and the choice is which
696 treatment to fund, then calibration is not appropriate. In that case,
697 each member of the population is trading between risks of different
698 outcomes, and each would rationally maximize uncalibrated QALYs in
699 so doing.

700 Rather, we are envisaging that known sufferers of the chronic pain
701 condition (like those who are blind from birth in the earlier examples)
702 are members of the population for whom the basket of services is being
703 chosen. (Whether this is appropriate for a particular condition may
704 depend upon the age of incidence – a issue touched upon in [section IV](#).)
705 Their perspective with the condition is the one that is pertinent to the
706 community's choice of service basket: there is no legitimate argument
707 based upon what choices they would have made from a full health
708 perspective had they been merely at risk of the condition that they
709 now irremediably have. They cannot be bound by such hypothetical
710 choices.

711 As this is a question of interpersonal comparisons rather than
712 of risk optimization for a single set of people, the group with this
713 condition can invoke the equal value of human life in defending
714 their claim to have the health gain on offer recalibrated to their
715 maximum health prospect. If the intuition of equality is challenged
716 by this example – attributing as it does equal value to a year with
717 chronic severe pain only remitted for an hour a day and that of a
718 year with no disability – the burden of proof is on those who would
719 salvage some coherent account of a commitment to the equality of
720 human life. Alternatively, the objector would have to abandon that
721 principle, and then presumably countenance differentiation of the
722 intrinsic value of life across all dimensions of function (intelligence,
723 strength of interpersonal relationships, happiness of disposition *inter*
724 *alia*).

725 It is clear that the proposed calibration of comparative health
726 impact on different people conflicts with our unreflective judgement
727 of comparative value of different health states – as these will
728 unreflectively be based on an intrapersonal comparison.

729 For example, recall from [section I](#) that in the discussion of the
730 Dworkin insurance model we considered treatments respectively for
731 heart and for cancer patients, the heart treatment yielding fourteen
732 untroubled years, the cancer treatment delivering fifteen years marred
733 by significant pain and disability. We saw that so long as we are
734 ignorant as to which group cancer risks apply, and to which group
735 heart risks apply, then appraisal is for the general population. In
736 which case, interpersonal comparisons of value are not involved
737 and calibration for equality is not required, so the heart treatment
738 can be selected for the basket of treatments. If, however, the two
739 groups are distinct, calibration for equality requires us to view the
740 best health prospect for each group to be of equal intrinsic value
741 year by year, and the cancer treatment must be selected (at least
742 if they involve equal total cost per person). This outcome may
743 seem counterintuitive, perhaps because we slide between the two
744 cases.

745 To press the point, suppose there are two separate groups of
746 individuals, *A* and *B*, who are at equal risk of contracting respectively
747 condition *A* and condition *B*, and all who contract these conditions
748 would die with no treatment. (Again, it is important that these are two
749 separate groups; if all were at risk of either disease, then intrapersonal
750 comparative valuation would yield answers without the need for
751 calibration.) Suppose for those who contract condition *A* treatment *A1*,
752 which gives health state hs_1 for one year, is preferred to treatment
753 *A2*, which gives health state hs_2 for three years, given the difficulties
754 implicit in the latter state. The only available treatment for condition
755 *B* is treatment *B*, which gives health state hs_1 , for two years. Given
756 that hs_B is the maximal health state for condition *B* sufferers, it must
757 be assigned a HRQoL score of 1. If resource is available only to treat
758 those at risk of condition *A* or those at risk of condition *B*, but not
759 both, and treatment costs and other relevant impacts are the same,
760 treatment *A2* would be socially preferred to treatment *B*, as it yields
761 three years to every beneficiary whereas treatment *B* yields only two
762 years. As *A1* yields only one year, were it taken to displace treatment
763 *A2* from the social reckoning (given that it is preferred by *A*), treatment
764 *B* would be chosen. Yet, the potential for three years of life for group *A*
765 is what is normative for the social decision-maker comparing the two
766 treatments, notwithstanding that the outturn (given that group *A* will
767 actually opt for treatment *A1*) will be fewer years in the same health-
768 state than would have been achieved for group *B*. Whilst longevity

769 may be sacrificed for quality of life by individuals in group A with
 770 respect to their own lives, social cost-benefit analysis is constrained
 771 not to make such sacrifices interpersonally. Where there are different
 772 population groups for whom outcomes are being compared, calibration
 773 to maximum health prospect is required.

774 Perhaps this corollary of the principle of equality remains
 775 counterintuitive. The analogy with dexterity or height or intelligence
 776 or pulchritude or happiness of disposition may help to render this
 777 approach natural. These attributes are generally valued as goods in
 778 contexts in which we assess how much human beings can contribute to
 779 others' lives (for example in recruitment for employment or selecting
 780 members for a sports team or a musical ensemble), or when seeking
 781 to avoid hazards that might jeopardize our capabilities in these
 782 dimensions, or in the exceptional cases where a deficit can be remedied
 783 (by a growth hormone, or by therapy of some sort, or by surgery). But for
 784 the most part, we accept that we are endowed with different levels of
 785 these attributes, and that that is our lot, without these differences
 786 rendering us less or more valuable intrinsically as human beings.
 787 Hence, when assessing relative effectiveness of health interventions,
 788 these differences are irrelevant. Irremediable health conditions should
 789 be treated likewise.

790 IV. IMPLICATIONS FOR THE PRACTICE OF 791 HEALTH ECONOMICS

792 What difference should this proposal make in the practice of health
 793 economics?

794 Calibration to maximum health prospect ought in principle to have
 795 wide application: given the high incidence of multiple morbidity,
 796 treatments will often benefit large numbers of individuals with
 797 a range of other pre-existing conditions or disabilities; without
 798 calibration, the benefit of treatments for such individuals would be
 799 reckoned to fall short of benefits to otherwise healthy and able-bodied
 800 individuals.

801 In practice, however, health economics valuations are usually
 802 valuations of treatments, and appraisals of treatments generally
 803 assume that the target group is homogeneous. If a treatment is
 804 approved, it will be approved for a population, and ethical and legal
 805 norms governing the clinical context will prevent any discrimination
 806 against the disabled in authorizing or funding the treatment, whilst
 807 clinicians determining to whom to apply these treatments are sheltered
 808 from the direct application of cost-utility analysis. (Co-morbidities are
 809 taken into account but only to the extent that they raise risk of adverse
 810 outcomes or reduce likelihood of recovery.)

811 Calibration to maximum health prospect as here proposed is
812 therefore achieved simply by *not* making any explicit adjustments for
813 individuals with co-morbidities or disabilities notwithstanding their
814 lower achievable health prospect. For example, where a treatment
815 offers a full cure for a disease, it is normally implicitly assumed that
816 all individuals who benefit from the treatment will be returned to full
817 health, notwithstanding that some individuals who benefit from the
818 treatment will have other conditions or disabilities that affect their
819 health (so that ‘full health’ is effectively understood as ‘maximum
820 health prospect’).

821 Hence, our proposal can be seen primarily as a principled justification
822 of current practice. It implies that it would not only be a breach of
823 clinical ethics to discriminate against the irremediably blind person
824 in authorizing a risk-mitigating treatment, it would also be a mistake
825 from a cost-effectiveness perspective, even if it were only marginally
826 cost-effective.

827 The implications of the methodology are less straightforward for
828 treatments whose principal beneficiaries are those who have fallen
829 victim to a progressive disease that limits maximal psychophysical
830 function, and for the elderly. The measured QALY impact, and hence the
831 assessed value for money, of interventions to slow illness progression is
832 systematically reduced if potential health gain is assessed relative to a
833 general population conception of full health, as is standard practice.

834 Whether this is discriminatory depends upon the perspective
835 employed: whether we seek to maximize outcomes for the currently-
836 healthy at-risk population (as in a Dworkin insurance model) or
837 whether those currently suffering from such conditions should be
838 considered part of the population for whom the basket of services
839 covered by health services is being chosen.

840 For example, suppose we do take the view that it is the valuation
841 of diabetics rather than those merely at risk of diabetes that should
842 be authoritative in assessing an intervention to reduce risk of adverse
843 sequelae. In that case, the importance of avoiding a particular adverse
844 outcome – like blindness – is assessed for its estimated particular
845 impact proportioned to the realistic health aspirations of those with
846 diabetes (rather than relative to some standard characterization of full
847 health). Standard assignments of HRQoL level to health prospect, i.e.
848 those based upon responses from surveys where respondents assume
849 no fixed limit to achievable psychophysical function,¹⁷ would have

¹⁷ E.g. P. Dolan, C. Gudex, P. Kind and A. Williams, ‘A Social Tariff for EuroQoL: Results from a UK General Population Survey’, University of York: Centre for Health Economics, 1995, Discussion Paper 138.

850 to be recalibrated for application to a population with maximum
851 health prospect involving irremediable disability. Thus if a treatment is
852 under consideration for a population whose maximum health prospect
853 would be assigned a HRQoL level of m for those without irremediable
854 disability, then all other prospects with a standard assignment of 1, less
855 than m , should be scaled up to $1/m$. (For example, a prospect standardly
856 assigned a level of 0.2 would be rated at 0.5 for a population whose
857 maximum possible health prospect would be rated for the population
858 without irremediable disability at only 0.4.)

859 The same dilemma regarding perspective arises with much more
860 general application in considering treatments that particularly benefit
861 the elderly. Health economics valuations of treatments are sometimes
862 reduced on account of the lower average self-reported health-related
863 quality of life scores of the elderly, notwithstanding that these lower
864 scores are unavoidable. (This discount is applied to the fewer life years
865 that are inevitably attributable to treatments benefiting older people.)

866 The methodology proposed could be used to avoid such diminished
867 valuation of additional years and increased health relative to maximum
868 health prospect for the elderly as for all those with incapacities
869 unrelated to the condition targeted by the intervention being appraised.

870 Whether it is appropriate thus to calibrate elder life years to
871 best attainable health prospect depends upon whether we can adopt
872 the Dworkin insurance model for this group. To do so would allow
873 consideration of disabilities associated with age to be weighed by each
874 potential beneficiary of health services 'looking from youth down the
875 course of their lives and trying to decide what risks were worth running
876 in return for not running other kinds of risks'.

877 It is at least arguable that older citizens would hope that their
878 diminished average level of health would not be allowed to compromise
879 valuation of the prospective health treatments from which they might
880 benefit, and that they might deny the relevance of the insurance
881 argument. Evidently the timing of the selection of treatments for the
882 insurance basket relative to the life course of members of society, and
883 the temporal scope of decision, are relevant when determining which
884 infirmities are to be considered known. Perhaps the constituency whose
885 welfare is at issue should be defined by a planning horizon for the
886 decisions to be made. If any who might benefit are currently suffering,
887 then their perspective, alongside those merely at risk, would at least
888 be relevant.

889 It is a subtle point in political economy and in social contract theory
890 requiring debate and further work whether the participants in the
891 contract are to be considered all to be in their youth as Dworkin
892 seems to suggest; or whether we envisage some broader constituency,
893 and if so how to integrate competing perspectives regarding the same

894 intervention. However, what is clear, or so I have argued, is that
 895 respecting equality of human worth requires calibration of welfare
 896 impacts for all those for whom social decisions are being taken to their
 897 best attainable welfare prospect however limited that may be; to do
 898 otherwise is to denigrate their intrinsic life-value.¹⁸

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**UTILITAS ARTICLE PROOF CORRECTIONS: UTI
1600019**

QUERIES

Page 1, line 26: 'prospect' OK, or 'prospects' (plural)?
 Good point, but better change the first part of the sentence to the singular, shifting the apostrophe in "individuals" and adding "each" before "individual's", to read:
 "... gains to each individual's own maximal potential health prospect."

Page 10, line 355: '(1 ~~HRQoL_{hp}~~)': is the dash after '1' a minus sign?
 Yes it is supposed to be a minus sign.

Page 11, line 434: 'beneficiary's ...': 'a beneficiary's'?
 Yes, that would be better, thank you.

Page 13, line 509: 'average **citizens'** assessment': OK as plural possessive, or should it be 'citizen's' (singular possessive)?
 The problem is actually that it is the assessment that is average not the citizen! So better to invert "average" and "citizens'", and drop the "an":
 Calibrating against ~~an~~ citizens' average assessment

Page 17, line 671: [Your instruction:] delete "To"; insert "From".
My comment: which 'To'? There are two 'to's in this line and both seem correct. Do you intend another line?
This edit should have been marked to line 679 – sorry! It should read:
~~From~~ From those with
 680 this condition, suppose we elicit

¹⁸ I am grateful to the following for perceptive comments: Eric Nord, Tongtong Qian, the Editor and an anonymous reviewer for *Utilitas*, members respectively of the Golders Green Kreis, of the Health Economics Study Group of the United Kingdom, and of the London Economics Journal Club of the UK Department of Health. Views expressed are not necessarily those of the Department of Health.