What Values Should Count in HTA for New Medicines under Value Based Pricing in the UK?

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I. Introduction: Value Based Pricing and Multi-Criteria Decision Analysis

The National Health Service is, once more, about to embark a programme of very significant reform, particularly with regard to the organisation of financial control and its response to finite budgets and scarce resources. Although these developments are new, and their implications as yet unclear, they have been foreshadowed by earlier developments. These include a report on Value Based Pricing produced by the Office of Fair Trading in 2007 (OFT, 2007), and the continuing struggle by NICE to attempt to incorporate a concern for 'social values' into decision making (NICE, 2008).

Part of the impetus for these changes comes from moving beyond health gain as the sole currency of value in the NHS to wider conceptions of social and economic value. As such this means that multiple criteria for evaluation and decision making will be involved, and so multi-criteria decision analysis (MCDA) will become an increasingly popular technique.

The basic issue involved in invoking MCDA is to modify the formal element of the NHS decision-making process so that other values besides absolute health gain can be incorporated. And indeed it seems clear that many other sources of value should be added, such as distributional issues, and further social goals, which have been variously addressed in the NICE constitution (Rawlins, 2010), the NICE Social Value Judgments paper (2008) as well as numerous other documents such as NICE Citizens Council reports. If such issues are widely considered important by the public, yet do not explicitly figure in NICE assessments, then there is a danger that we are not doing the best – the ethical best – with our health budget. Indeed the "QALY is a QALY" approach of NICE may not reflect the views of the public. If this is so then there is a sense in which, from the public point of view, the NHS is not getting the best for its budget. The remedy for this problem is to incorporate a wider "societal perspective" which is driven by societal approval for policies that may diverge from maximizing total health gain. It is worth noting that incorporating any value other than health gain can be expected to lead to the consequence that health gain will not be maximized. However, where other considerations are taken to be more important than pure health gain this consequence has, in effect, been accepted in advance.

Hence there is an ethical and economic imperative for all interested parties to try to arrive at a decision process that reflects the social values that can legitimately be incorporated, and VBP aims to reflect the values that are worth funding through the state in general and the NHS in particular. Although the details are not yet known, the basic idea is that the prices of pharmaceuticals should reflect the 'value' that they will create. Once this notion of value is broadened to include social value as well as health value, then a profit-seeking pharmaceutical company will have a commercial incentive to invest in areas that will do the most social good. Hence if the programme is set up sensitively, problems of incentive compatibility for industry and government are greatly lessened. A company, in seeking to maximize its profits, will automatically be drawn to attempt to do the most good for society against the budget constraint of the available public funds. The state, in seeking to derive the best outcome for patients and taxpayers, aims for the same goal.

In sum, a move to MCDA will help to incorporate the full range of relevant values into health decision-making. When this is combined with value-based pricing there is a possibility of creating a 'win-win' situation for the NHS, the tax-payer, and the pharmaceutical companies, although, of course, there are many technical and practical challenges to be faced before this can be a real possibility.

This paper does not attempt to address the technical questions of how to implement MCDA or to combine it with VBP. Rather it will explore the preliminary ethical questions of what values should be included in a "long list" of values which might be employed in a health assessment MCDA (whether or not combined with VBP) and also appraise them in order to come to a recommendation around prioritisation within potential future policy change. There are three stages to any MCDA:

- Identifying and defining the values
- Quantifying the values
- Determining their weights

Or "define, score and weight" as known in cost-benefit analysis generally.

Our primary task here is step 1 - to identify and define the values. Our methodology is to start with a wide 'long-list' of possible values, and then to consider a range of considerations for and against including them. We will then make suggestions about which values should go forward to the next stage.

In considering different values for inclusion it has become clear that certain differences in opinion as to the suitability of particular values can sometimes be attributed to different views about the appropriate objectives of a health system. On one view money allocated to the National Health Service is allocated for one purpose only: to improve population health. Accordingly, the sole goal of the Health Service should be to maximise health. Others will feel that it is legitimate for the NHS to take other concerns into account, such as those of social justice or fairness between individuals, or aspects of individual well-being beyond health. Indeed many proposed extensions will fall into the category of 'priority to the worst off' where different groups can be understood as worst off on different distinct criteria. Other extensions can be regarded as attempts to make the evaluation more 'inclusive' in the sense of including additional factors such as the well-being of carers. It is also possible to consider the NHS as, in part, an instrument of industrial policy, and so certain macro-economic factors should also be taken into account. A further view is that the aims of the NHS are not set in stone or a matter of decree, but, in a democratic society, should be responsive to what the people want them to be.

This question of the overall objectives of a health system cannot be settled here. However we can, in some cases, diagnose disagreements as being explicable in terms of disagreement about objectives.

Our background research draws from three areas:

- Research into public preferences for QALY weighting.
- Issues surrounding the values to be included in value based pricing (Claxton, 2007; Towse, 2007, 2010), and particularly the role of innovation after the Kennedy report (see Kanavos et al, 2010).
- The application of multi-criteria decision analysis to policy in health care in particular.

Accordingly, in order to generate a list of candidate values we started by examining other attempts to address this issue, which we then supplemented first by our own work in the area of conflicting values in policy appraisals, and then finally by summaries of lists made available to us by Warren Cowell from two briefing notes he has presented to Pfizer.[1]

[1] "Multi Criteria Decision Analysis (MCDA) Approaches: Briefing for Pfizer working team" and "MCDA: Pfizer proposed criteria list/structure" both of August 2010.

The lists we consulted include: lists implied by the various reports of the NICE citizen's council; NICE guidance and the "social value judgements" (2008), or SVJ, document; SMC's 'Modifiers' list; the new AGNSS MCDA framework; lists implied from the "Social Value of a QALY project" (Baker, Bateman and Donaldson et al, 2008; Dolan et al, 2008); the ANNALISA list; Canada's EVIDEM framework; a list from Golan (2010) cited by Devlin and Sussex (2011); and others. We do not claim that our list is exhaustive and the "true, best" list, only that it is representative of the concerns that are current in the literature.

We should note that the various lists do not always use the same terminology, and do not always categorize issues the same way, so there is always a danger of repetition, overlap or double-counting if every value was included as originally stated. In the process of arriving at the particular values we consider here we have undertaken an exercise of comparing the different concepts used, and, where necessary, eliminating or modifying elements so as to avoid such difficulties. For reasons of economy of space we do not here include an account of the deliberations that led to the particular formulations we adopted.

II. Multiple Criteria Decision Analysis: Philosophical and Decision Analysis Perspectives

We introduce the idea of multiple criteria through two familiar means of understanding multiple criteria for evaluation: the study of value pluralism in philosophy and traditional multi-criteria decision analysis in the field of decision analysis and decision theory. In effect these are alternative routes to the same general issue of how to combine a variety of apparently irreducible elements into a single decision.

II.A. Value pluralism

The current interest in MCDA reflects a broader philosophical theory of value pluralism. Value pluralism can be contrasted with value monism: the idea that, ultimately, there is only thing, or type of thing, that has value. The most common form of monism is some sort of subjective-welfare theory, such as that currently advocated by Richard Layard in his book *Happiness* (2005). Layard claims that the only thing that has intrinsic value is happiness. Other things, such as friendship, health, and play, can be valuable, he suggests, but only because they lead to happiness. Within the medical field some theorists seem to come close to the idea that the only thing that has ultimate value is health. Consider an activity that makes people happy, both in the long and short term, but is damaging to their health. A happiness monist would argue that this activity has positive value, while a health monist would argue that it has negative value. A pluralist, however, might argue that health and happiness are both of value, independently of each other, and the situation so described requires more detailed analysis to decide whether it is of positive or negative value. How this analysis might go can, however, be an exceptionally difficult question, and something to which we will return at the end of this paper.

The distinction between monism and pluralism is however, to some degree misleading. For example even if one were to take the extreme monist view that health is the only thing that is important, nevertheless health itself is a complex notion with many elements, and decisions may need to be made about whether to sacrifice one component of health for the sake of another. Hence MCDA may be needed even within a monist moral theory. In effect it is simply a technique to attempt to generate a decision in the face of a plurality of concerns.

II.B. Technical literature from decision analysis and psychology

The notion of MCDA is intuitive: decisions are made according to multiple criteria of value and trade-offs must be made between them. This idea has been formalized in formal decision analysis and operations research, as well as in psychology with studies of multi-attribute utility theory (MAUT). The literatures partly differ in terms of their aims. In decision analysis the MCDA literature has a prescriptive role. It is meant to provide advice to decision makers in order to help them make good decisions. In psychology the study of MAUT has a more descriptive role where the aim is to examine how decisions are made by respondents with different attributes. Nevertheless the descriptive nature of MCDA in psychology has a partly prescriptive role in that it highlights potential mistakes and failures of rationality that decision makers may wish to avoid.

There are several different basic types and methods of MCDA which differ in how to move from an initial list of values to a final decision. However, considering the different methodologies is outside the scope of the current report, as all must start in the same place: with an account of the values or concerns to be taken into account.

III. Populating a Long List

As mentioned above, our procedure will be to derive the possible list for health-related public policy, drawn from our analysis, and narrow down to a list of recommended values.

III.A. Reasons for inclusion or exclusion on the list

We here introduce the criteria that we employ to suggest why particular items should appear on a list of values, which will be mentioned in our reasons for inclusion and exclusion

- *Ethics* (also known as 'normative' reasons): We will not enter into an extended discussion of moral philosophy here in defining the domain of the moral, the role of moral objectivity, and the like. Instead, we will use a loose definition of ethics as judgements that are informed by other-regarding concern. We do not here assume that all forms of other-regarding concern are consistent with each other or can be placed in some form of neat hierarchy. In principle we accept that ethical concerns can conflict with each other, as well as with other sources of judgement. Where we cite 'ethics' as the basis for an argument we will generally refer to the health-related philosophical literature where such arguments are made. We also consider the demands of "equality impact assessments" in project appraisal under the heading of ethics.

- *Expert Opinion:* An expert opinion will most often be based on technical knowledge that may or may not be known by a wider public. So example, the public may be strongly attracted to a value, but there may be reasons of feasibility that make it impossible in practice to devise a policy that would be responsive to that value. In other cases academic research may reveal unknown biases or fallacies in public reason or judgement that need to be corrected. Furthermore economic theory may suggest certain considerations should, or should not, be incorporated. We have labelled all of these 'expert opinion'. We do not assume, however, that expert opinion is always correct, or that it should always override other considerations.

  A complication is that many of the judgements that we have labelled 'ethics' could equally qualify as 'expert opinion'. However it seems preferable to keep these considerations distinct, in that challenges to expert opinion will generally take the form of appeal to

technical (such as 'double-counting') or empirical considerations, whereas challenges to ethical judgements will more often take the form of argument about when other-regarding concern should be taken into account.

Where it is appropriate we have provided the source in the literature for the expert opinions we have cited. In some cases, however, the expert opinions are our own, based on our reflection on the cases. Where no source is provided, the expert opinions are our own.

- *Public Opinion (including expressed preferences):* We will refer explicitly to public opinion where there is clear evidence that members of the public have been consulted on an issue and have formed a view, whether positive, negative or indifferent. NICE's Citizen's Council provides one useful source, as does academic research.

  Including 'public opinion' however provides a difficulty in the present context in that many of the sources in which such opinions are given simply report the preferences or votes of the members of the public on the topic in question. As such they do not explain the reasoning of the public, and so it is often difficult to know why exactly the public have the opinion they do. This is important, as in some cases it may be that the public are swayed by considerations elsewhere on the list, and so there is a danger of double-counting. For example, in some studies the public wish to prioritise children. Is this because children will generally live for more years than adults, and so the health gain will be greater, or is it because there is an extra level of compassion for children? (Dolan et al. 2005, p. 205). The former 'double-counts' life extension, whereas the latter provides a separate reason. At this stage all we are able to do is to note the difficulties where they arise.

- *Legal:* Here we indicate those categories of value which otherwise have prima facie appeal, but which, it could be argued, should be prohibited because of concerns over legality. Once more where we are able to we have cited the source of such concerns.

- *Policy or Precedent:* There are a number of cases where values that could formally be included in MCDA have, in the past, been used in previous decision-making as a result of official guidance of various sorts. Here we note such cases as providing strong reasons for continuing to include such values, and in each case cite our source for the reason.

III.B. Value Types

For ease of exposition we will group values into categories. There are various ways in which this can be done, and the scheme we have adopted could be contested, and, indeed, even within the classification we have adopted some values could have been placed in different categories as they may contain several different types of reasoning. We do not think, however, that differences at the level of category headings will be material at this stage of the analysis. However they could become so later on, depending on what sort of aggregation method is adopted, and at that stage the classification will need to be revisited. In the meantime we have chosen to classify values in what seems to us a plausible and intuitive way. Obviously, there will generally be a correlation between the justification or reason for inclusion of the value, and the value type into which a particular value falls. For example, "ethics" reasons will very often be included under the heading of "social values". But not all values under the social value heading will be justified by "ethics", nor will all values justified by ethics fall under the social value heading.

- *Health and Quality of Life Gains including survival* – Here we mean any gain to health, including life-extension, or what may be broadly described as quality of life. This may be for patients, dependents or carers. In what follows we will use the expression 'Health Related Quality of Life' (HRQoL) to refer to health gains and 'Well-being' to refer to non-HRQoL gains, such as improved ease of mind or ability to spend time with loved ones.

- *Social Values* – Here we mean values that the public generally feel are important for society at large, often regardless of one's own preferences. Social values often reflect a "citizen" perspective.

- *Industrial* – This refers mainly to "supply side" considerations, which will include any possible effects on the incentives for producers. Industrial concerns also include effects on the larger economy which could be counted directly in VBP, or which investment in health (through the pharmaceutical industry) might produce. This is the familiar but ambiguous idea that policy should serve "UK plc", although the degree to which the "societal perspective" should be employed in policy appraisal is unclear.

- *Policy Drivers* – Here we refer both to considerations of feasibility or "realpolitik", i.e., the unavoidable push and pull of interests and constraints in the political process, as well as considerations of market failure that may justify state intervention.

- *Technical Considerations* – In some cases a consideration may be desirable to include but impossible or very difficult to do so. For example, in order to be included in the next stage of analysis every value needs to be quantified, but in some cases it may be impossible even to come to a rough valuation of a particular value. Although we have not used this consideration at this stage of the analysis, it needs to be kept in mind for the next stage, when methods of aggregation are considered.

III.C. Value Summary

For each of the types of value, we will have four categories. These are:

- *Definition of the value*: here we will define the value in question in both any technical or non-technical senses.

- *Reasons for inclusion*: here we will give reasons that count in favour of inclusion of the value, drawing on one or more of the five sources of reason listed above.

- *Reasons for exclusion*: here we will give reasons that count in favour of exclusion of the value, drawing on one or more of the five sources of reason listed above.

- *Summary judgement on inclusion*: Here we will state a recommendation regarding inclusion or exclusion on the list, with a summary statement of our reasoning. There are three categories: near-certain inclusion, possible inclusion, and near-certain exclusion.

So to summarize, we can state that for any value it will:

- Be defined as a member of category or set of values.
- Be given a substantive definition.
- Have reasons for and against inclusion, referenced where possible.
- Have a summary judgement about its inclusion or exclusion in the list.

Before turning to the values that we consider we should mention the potential category 'cost', which in one sense is the most important value of all. Although it must figure in any resulting MCDA we have not included it in the discussion below as we assume that the situation in the future will continue to be one in which decision makers aim to make the most efficient use of a fixed sum of money. In effect our exercise is to consider what efficiency means when many sources of value are taken as legitimate goals to be included in decision-making. The fact that cost must be taken into account in effect goes without saying at this stage of the analysis.

IV. The List of Values

IV.A. Category I: Health Related Quality of Life and Well-Being Gains

Here we refer to any kind of gain to health and survival (defined using whatever scale) but also to the impact on quality of life that an intervention may provide. We also include patients, carers and dependents.

IV.A.1. Degree of life extension to patient (QALY 1)[2]

Definition: This concerns the fact that some amount of time is necessarily associated with any health gain, otherwise there would be no actual "vessel" for the health gain. The gain of life extension counts regardless of when in the recipient's life the life extension occurs. Furthermore, the value of life extension is completely linear with respect to duration, so five years of life extension is exactly worth five times the gain of one year of life extension, even if for any individual years of life extension may have a rapidly diminishing marginal value.

Reasons for inclusion:

i) As noted in the definition, the degree of life extension is a conceptual necessity for considering health gain at all. (Expert opinion)

ii) Studies have been interpreted to suggest that members of the public give value to the mere fact of living alone, over and above any quality of life improvement. (Mason et al, 2009) Public/Expert opinion.

Reasons for exclusion:

i) Some studies indicate that a significant portion of the public do not think that life extension is valuable in itself unless the life is in some way worth living. (Popular opinion, Brock and McKibben, 2011).

Summary judgement on inclusion: **Green** - The reasons for exclusion provide grounds for considering how quantity and value of life extension interact (see Tilling, Devlin, Tsuchiya and Buckingham, 2009 for a thorough literature review on the measurement questions.) These reasons do not justify exclusion.

IV.A.2. Degree of health gain to patient (QALY 2)

Definition: The nature of health is debated, and is a matter of controversy in both academic debates in health and in philosophy. For current purposes, however, we can accept that most of the

[2] Within the QALY we disaggregate the "quality" from the "life years" component because health' and 'life extension' can be considered separate sources of value and within the context of an MCDA it is important that no assumptions are inadvertently made about trade-offs between values.

important elements of health states can be captured by a generic health related quality of life generic measure such as the EQ-5D scale, or similar instruments (e.g., HUI3, SF-6D).

Reasons for inclusion:

i) Given that the entire discussion concerns the allocation of scarce financial resources within the National Health Service it would be conceptually impossible to leave out health gain. (Expert opinion)

Reasons for exclusion:

i) Some health gains are very trivial; others though significant could be unaffordable. (Expert opinion)

ii) Health is very difficult to define, and may turn out itself to be composed of elements that cannot be traded off against each other, or at least not in any way which does not contain significant interaction effects. The QALY, when combined with EQ-5D, accepts that health is multi-dimensional, but presupposes a method for turning such multiplicity into a single number. This requires the assumption of non-separability, which is an extremely contentious assumption that is likely to be false particularly in different domains of quality of life, as in HRQoL measures. (Expert opinion)

Summary judgement on inclusion: **Green -**The reasons given for exclusion are (i) not reasons to exclude health gains, but simply to recognise that it is not always a decisive factor (ii) questions about the difficulty of quantification, not reasons for exclusion.

IV.A.3.Impact on patient's well-being

Definition: This refers to the fact that the process of treatment itself could have well-being effects, independently of the final health outcomes. For example, certain treatments, while effective, can be inconvenient, awkward and time-consuming to administer, or offend against the dignity of the patient. We are accounting here for those aspects of a treatment which might be valued but that are not captured by the exclusive concern with "end points" in health gain as specified by the NICE reference case.

Reasons for inclusion:

i) An unpopular form of treatment is less likely to be complied with. This is directly important for the efficacy of treatment. (Expert opinion)

ii) Well-being and dignity effects can be valuable independently of health gain. (Ethics)

iii) The quality of the 'process of care', independently of effects on health, is included as a desirable goal in the NHS Outcomes Framework. (Precedent, Department of Health 2010)

Reasons for exclusion:

i) It might be thought unfair to drug companies to consider compliance, and that ensuring compliance should be the responsibility of the GPs or social services. (Expert opinion)

ii) Issues of compliance should already have been taken into account in trials, and therefore this would involve double counting. (Expert opinion)

Summary judgement on inclusion: **Green** - The health gains will already have been included in the analysis. However, the non-health gains to wellbeing are important to patients and should be included. But it has to be kept clear that what is at issue here is non-health gain.

IV.A.4. Impact on health of carer

Definition: As in IV.A.2 we can accept that most of the important elements of health states can be captured by the EQ-5D scale, or similar instruments.

Reasons for inclusion:

i) Caring for another person can be detrimental to the physical and mental health of a carer, which is undesirable in itself and may lead to future calls on the NHS. Considering the effect of a patient's health on their carer's health, and taking measures to reduce such impact, is an enlightened application of preventative medicine (Expert opinion)

Reasons for exclusion:

i) It will be rare that such effects can be predicted. (Expert opinion)

ii) Each patient should be considered on his or her own merits and not on their effects on others. (Expert opinion)

Summary judgement on inclusion: **Green -**The reasons given for exclusion seem weak. Even if the exclusive focus of the NHS is on health, it is reasonable to include the health of carers.

IV.A.5.Impact on carers' well-being

Definition: For those with severe conditions where carers are needed, the effects of a treatment on the carers' general well-being could be taken into account. Here we are concerned about the carer in the role of carer, and not as a family member or dependent, which we address below in IV.A.7. Further, we are concerned here only with non-health well-being, as health-related quality of life of carers is already discussed above.

Reasons for inclusion:

i) This has a straightforward welfarist justification in that it improves the welfare of a citizen. (Ethics, expert opinion)

Reasons for exclusion:

i) It may not be possible to divide conditions into those where a carer will be needed and those where this is not so, and so there may be a grey area where it is not clear whether this condition will apply. (Expert opinion)

Summary judgement on inclusion: **Green** - The existence of grey areas does not rule out the possibility of using this criterion in clear cases, such as patients with Alzheimer's syndrome, severe autism or those who are bedridden, and in such cases the carer's well-being should be included.

IV.A.6. Impact on health gain of family or dependents

Definition: Again as above we can accept that most of the important elements of health states can be captured by the EQ-5D scale, or similar instruments. Here we are concerned with family members or dependents as such, and not in their possible roles as carers.

Reasons for inclusion:

i) Living with and/or being dependent upon a person with an illness can be detrimental to the physical and mental health of a family member or dependent, which may also lead to future calls on the NHS. Considering the effect of a patient's health on their family and dependent's health, and taking measures to

reduce such impact, is an enlightened application of preventative medicine (Expert opinion).

Reasons for exclusion:

i) It will be rare that such effects can be predicted. (Expert opinion)

ii) Each patient should be considered on his or her own merits and not on their effects on others. (Expert opinion)

iii) NICE's Social Values guidance rules out discrimination on the basis of family membership. (NICE 2008) (Legal)

Summary judgement on inclusion: **Red –** There will be very, if any, few conditions where this consideration can apply for it will be rare that direct effects on health of family members or dependents can be observed. Even in the case of infectious disease, the reason for treatment includes the possibility of transmission to anyone, whether family, dependent, or not. It will also be very hard to sort between cases of illness that have a tendency for significant effects on the mental health of family and dependents and those that do not. In the case of maternal health, however, there does there seem to be a direct connection between a mother's health and that of the fetus, and it would seem very important that these effects should be taken into account. However fetal health would already be included in a QALY assessment and to add it again would be double-counting.

IV.A.7. Impact on well-being of family and dependents

Definition: Many cases will involve patients who have financially and emotionally dependent children. However, in principle this could also include any patient who looks after, or has a close relationship with after another person, such as an elderly relative, or spouse etc.

Reasons for inclusion:

i) There seems to be an intuitive appeal to the idea that 'knock-on' effects should be taken into account, and the greater the level of need, including both the needs of the patient and their dependents, the greater weight. (Ethics, popular opinion)

ii) The NICE Citizen's Council report on *Departing from the Threshold* (2008) considered the category "the intervention will have a major impact on the patient's family" as one of the most important consideration to take into account. Note that this is a wider category than "impact on dependents". (Popular opinion)

Reasons for exclusion:

i) The NICE Social Value Judgments document, like many similar documents rules out discrimination on the basis of family status, which is unlawful. (Legal)

ii) It seems very unlikely that it will be possible generally to classify treatments into those that will address the health needs of people with dependents or family and those of people without. (Expert judgement)

Summary judgement on inclusion: **Red** - both reasons for exclusion seem decisive, even in the face of the intuitively appealing arguments in favour.

IV.A.8. Unavailability of alternative treatment

Definition: In some cases a patient group is already receiving a certain treatment, and NICE faces the question of whether to licence a treatment that offers extra benefit at extra expense. In other cases there is currently no available treatment for a condition, and a new treatment offers a first chance of addressing a condition.

Reasons for inclusion:

i) It is commonly thought that pharmaceutical companies put too much research effort into 'me too' drugs, to provide an improvement on existing treatments, when there is a much more urgent need to open up lines of treatment for neglected conditions (OFT 2007). (Policy, expert opinion)

ii) Targeting untreated condition gives preference to those in greatest need and was considered important in the NICE Citizen's Council *Departing from the Threshold* report (2008). (Public opinion)

iii) The NHS offers its services to all. Those who have a condition for which no treatment is offered have a reason to think that they are being unfairly excluded. (Ethics)

Reasons for exclusion:

i) Severity of condition and innovation are considered under different categories. Hence there is a serious danger of double counting here. (Expert opinion)

ii) It is not true that those for whom no pharmaceutical is available are necessarily being excluded by the NHS. It may be that other forms of non-pharmaceutical treatment are available, but in any case the patient will have access to medical advice in the same way as any other patient. (Expert opinion, ethics)

Summary – **Amber** - To some degree this is accounted for under other headings. However it would be worth conducting further public opinion research to explore whether there is support for this factor as an additional independent reason beyond severity and innovation.

IV.A.9. Leading to other definitive treatments

Definition: Some treatments provide relatively little health gain, but are necessary but not sufficient for some other health gain to be obtained from another treatment. When taken in isolation such treatments are not cost-effective but as part of a broader treatment package with a very low £/QALY the summed £/QALY of the two-part intervention might well be under the threshold. This has been referred to as 'options' value. One can easily imagine a case where a new drug will not provide a great deal of health gain, but will provide the conditions for another drug that would provide a great health gain.

Reasons for inclusion:

i) Obviously when considered as part of a package, this can be represented as a straightforward health gain. (Expert opinion)

Reasons for exclusion:

i) It might set a dangerous precedent. In principle it opens up a Pandora's box where any intervention that might produce some health benefit in concert with another intervention could be funded, which might complicate matters beyond reasonable limits. (Policy constraints)

ii) An accurate evaluation of such technology will already have included the health gain available when used in combination. Hence to add this as an extra factor will be double-counting. (Expert opinion)

Summary judgement on inclusion: **Red -** The double counting considerations seem to be decisive.

IV.B. Category II: Prioritized Subgroups

We here refer to sub-groups that should be given priority in treatment. In principle there are two types of sub-groups that we discuss. The first is those sub-groups who are felt to have pressing health needs that would not be captured through standard QALY calculations. The second is those sub-groups who are disadvantaged for reasons that are not directly defined in terms of health need. Whether the second class of sub-groups should be included will be a question at the level of objective. If it is felt that the NHS should be an instrument of social justice as well as health, then there will be strong reasons for considering whether certain disadvantaged groups should be given extra priority in health allocation. If, however, it is felt that more restricted objectives for the NHS are compelling then the case is correspondingly weakened. Here we take the view that social justice should be part of the NHS brief, as this seems to be in line with current government policy. However we acknowledge that this is arguable.

We should also make a distinction between a group being *prioritized* and how that group is *targeted* through a particular procedure. To be prioritized is an umbrella term as we use it here, to indicate that some sub-group is deserving of moral priority in deliberations about the allocation of resources in HTA. Any prioritized sub-group that actually is considered favourably in deliberation is then targeted through the particular policies and interventions under consideration. Sub-groups can be targeted in one of two ways, directly as a *targeted* population and *indirectly* as a targeted treatment. That is, in one instance one might attempt to target a particular subgroup directly by ensuring that certain types in a population receive a treatment. For example, we might simply identify in advance a sub-group, say, members of a particular disadvantaged ethnic minority. In a second instance, the treatment itself is known to be associated with particular types of beneficiaries, and the decision to fund a treatment is weighted because of the estimated impact on a condition that has high prevalence among a particular targeted subgroup. For example, suppose a condition is correlated nearly perfectly with a particular disadvantaged group; in choosing to fund that treatment one is not targeting the group directly, but instead indirectly targeting them through funding the treatment. Note that the two cases differ because, if perfectly implemented, the first direct form of targeting would only ever serve the targeted population. In the second case, where a treatment is funded to treat a condition correlated with a disadvantaged group, it could well be that other individuals not in that disadvantaged group could also receive that treatment. Although both cases of targeting are forms of positive discrimination, direct targeting appears to be a more explicit case of discrimination.

Thus the issue of targeted subgroups raises considerable complexities. Under current circumstances NICE makes decisions as to whether particular treatments will be refunded, and once a positive decision is made it will be generally available for prescription for the designated condition(s). Generally, it will only be possible to target a sub-group through NICE-style appraisal if a condition is more prevalent within one sub-group than in the general population.

There are, however, isolated examples where clinicians are given permission to provide a particular treatment to some patient groups but not others. However, for present purposes we have assumed that this will be very rare, unless the sub-group can be defined in purely clinical terms. Therefore, the inability to target particular groups provides a serious obstacle to inclusion of some considerations.

IV.B.1.Severity of illness

Definition: Disease severity concerns those conditions that have the lowest score in terms of the EQ-5D index, such as those conditions that leave people permanently bed-ridden with severe health problems.[3]

Reasons for inclusion

i) The normative pull of equality and prioritizing the worst off is well established in political philosophy (Ethics) and giving priority to the most severe conditions was given high weight in the NICE Citizen's Council *Departing from the Threshold* report (NICE Citizen's Council 2008), and other studies (Dolan 2008). (Public opinion)

Reasons for exclusion:

i) Some studies suggest that the public do not give priority to treating those in severe conditions if the improvement to their health is not substantial. (Baker, Bateman, Donaldson et al 2008) (Public opinion)

ii) Those with severe health conditions may be very difficult to treat and it may be may be impossible to provide any significant health gain. (Expert opinion)

Summary judgement on inclusion: Our conclusion is **Green**, in cases where a non-marginal health gain is possible.

IV.B.2. Pre-existing health state

Definition: This differs from IV.B.1 above in that it refers not just to the current condition of an individual but also their long-standing health state. The treatment may or may not be exclusive to people in their condition (e.g. a disabled person who needs both special therapy for the disability and a heart operation that is not specific to people with their particular disability).

Reasons for inclusion:

i) It has been a long-standing criticism of the QALY approach that it 'discriminates against the disabled' in that those of permanent low health are capable of fewer QALYs than others, and so would be a lower priority for treatment. (Ethics)

Reasons for exclusion:

i) The standard response to the above is that NICE licences treatments and does not judge how much benefit particular individuals will derive from the treatment. Therefore there is no discrimination, as treatment is made available not on the basis of individual potential to benefit. (Expert opinion, ethics)

ii) Those with severe, long-standing, health conditions may be very difficult to treat in a way that provides more than a very small health gain. (Expert opinion)

Summary judgement on inclusion: **Green** - It may be that a treatment specially designed for a patient group could improve their health status to a significant degree proportionately to their previous state, yet not be cost effective in QALY terms because of long-standing disability. There seems,

[3] There is often overlap between the categories of least health population (severity of condition), pre-existing health state, life-saving and end of life treatments. However, we separate them for conceptual reasons, and we have noted that with all categories we must be wary of the possibility of double counting.

therefore, good reason to include this as a special factor, provided that the health gain available is of a reasonable dimension.

IV.B.3. Life saving treatments

Definition: Where a person is facing an urgent and immediate threat to life, and an intervention could return them to a reasonable degree of health, perhaps even to their previous health state. These are distinct from the normal case of life extension, in that the threat of death is immediate, perhaps in the next few days or weeks, and a good recovery is possible. An example may be emergency surgery after an accident, or the provision of a powerful anti-biotic in the case of severe infectious disease.

Reasons for inclusion:

i) This was given the highest rating by NICE Citizen's Council *Departing from the Threshold* Report. (Public opinion)
ii) There has been a certain level of support in the philosophical literature for the so-called 'rule of rescue' in such cases. (Ethics)
iii) It seems very difficult to justify policies where society declines to save the life of an identified person (who is capable of a good standard of future health) on the basis of cost-effectiveness, especially in the light of media scrutiny. (Policy)

Reasons for exclusion:

i) While the rule of rescue has great intuitive plausibility in cases such as miners trapped underground, where a special weight is given to saving their lives, and cost-effectiveness analysis is not normally applied, it is possible to defend these as special cases as they are rare, and have low budgetary impact. In a medical setting situations where a life can be saved are very common, and thus cannot be treated as special cases. (Policy)
ii) Saving a life and returning someone to full health where they might live for many more years generates many QALYS. Those who advocate special attention to life-saving may not have realised that life-saving will already get very high priority under standard methods. Hence there is a possibility of double-counting. (Expert opinion)

Summary judgement on inclusion: **Green -** The policy considerations seem very powerful, especially when combined with public opinion and the ethical arguments. Double-counting is a concern, but it does not seem that the reasons in favour of life-saving are exhausted by issues of health gain.

IV.B.4. Life extension for those near the end of life

Definition: Those who are facing imminent death who will be able to survive for a longer period, though not restored to full health, if given a particular treatment. An example may be a treatment that allows a cancer patient a few more months of life, though in a poor health state.

Reasons for inclusion:

i) Compassion decrees that we should extend lives when we can. (Ethics)
ii) NICE has issued guidance that allows for exactly this situation under certain circumstances. (NICE 2009) (Precedent)

Reasons for exclusion:

i) Support for 'life extension' was much lower than for other criteria, such as 'life saving' in the NICE Citizen's Council *Departing from the Threshold* report. (NICE Citizen's Council 2008) (Public opinion)

ii) Often those in the situation so described will have lived a full life and, in Alan Williams's famous expression, have had a 'fair innings'. (Ethics)

Summary judgement on inclusion: **Green** - While we feel that the arguments in favour of this consideration are less strong than arguments concerning severity, it would be very difficult in the current context to reverse the guidance that NICE has provided. Further, while some may see justification for age-weighting, the 'fair innings' argument is arguably illegal on grounds of discrimination.

IV.B.5.Type of illness and "dread": Cancer

Definition: Some conditions are particularly feared.

Reasons for inclusion

i) If a condition is feared then there may be a higher desire among patients for treatments than for other conditions of comparable health severity. There is some reason to believe that the public regard cancer in this way. (Public opinion)
ii) Although the Health and Safety Executive does not use the QALY (using the VPF instead) nevertheless in some of its guidance it 'takes the view' that cancer should be given double weight. (Health and Safety Executive 2001) (Precedent)
iii) The government have recently made extra funds available for cancer treatment. (Policy)

Reasons for exclusion:

i) No studies have been conducted that show how this factor should be weighted. (Expert opinion). In particular, no studies have shown that if the severity of the health state is constant across cancer and some other condition and this is made clear to respondents that the respondents will place a greater weight on avoiding cancer.

Summary judgement on inclusion: **Amber** -In principle it may well be true that the public dread cancer beyond its morbidity and mortality effects, yet the empirical base for this claim is lacking at the moment.

IV.B.6.Children and adolescents

Definition: Those under a particular age.

Reasons for inclusion:

i) This was a highly weighted category in the NICE Citizen's Council *Departing from the Threshold* Report (although no amplification was given to explain why this was included. (NICE Citizen's Council 2008) (Public opinion)

Reasons for exclusion:

i) It is easy to be confused about this consideration. Treatment of children is likely to have long-tem beneficial health effects and so treating children will generally provide many more QALYs than the same treatment for adults (although discount effects need also to be considered). To include this as a further consideration would be to double-count benefits. (Expert opinion)
ii) Some studies suggest that the public give priority to adults in the 20-40 year age range over children and older adults. (Baker, Bateman, Donaldson et al, 2008) (Public Opinion)

Summary judgement on inclusion: **Amber** -Further consideration is needed to see if the public's position can be clarified.

IV.B.7.Socially disadvantaged population

Definition: The socially disadvantaged can be defined in various ways, but for practical purposes can be defined in terms of their place in the net income scale.

Reasons for inclusion

i) For several decades it has been noted that there is a social gradient in health, and that, on average, health and life expectancy correlates with social class. Hence those of lower social and economic status have, on average, greater health need. (Expert opinion)
ii) Independently of the issue of the social gradient of health there is reason for giving priority in the allocation of public services to those who are worst off. (Ethics)
iii) The NHS currently adjusts the health allocation formula to take account of the extra health needs of the socially disadvantaged in an attempt to reduce inequalities in health. (Precedent)

Reasons for exclusion:

i) The NICE SVJ guidance explicitly rule out using considerations of social class (see above). (Legal)
ii) Opinion surveys do not provide clear support for giving priority according to social class (Dolan et al, 2008). (Public opinion)
iii) It may be hard to classify treatments on their appropriateness to different social classes. (Expert opinion) (However historically this has not always been the case (rickets) and this may also be currently the case for some conditions (TB)).

Summary judgement on inclusion:

We do not think that SVJ is an insuperable obstacle. It is well established in UK social policy that policies that attempt to improve the position of the disadvantaged are not discriminatory in the prohibited sense. NICE also says: "NICE can recommend that use of an intervention is restricted to a particular group of people within the population (for example, people under or over a certain age, or women only), but only in certain circumstances. There must be clear evidence about the increased effectiveness of the intervention in this subgroup, or other reasons relating to fairness for society as a whole, or a legal requirement to act in this way" (p. 25). **Green**, in cases where it is possible to aim at the target group.

IV.B.8. Individual responsibility

Definition: Some individuals suffer from ill-health as a result of their own actions (smoking, drinking, over-eating). The question arises of whether, if this is so, their treatment should be a lower priority for the NHS than that of other patients who have not been at all responsible for their own ill-health.

Reasons for inclusion

i) The moral logic of reciprocity and the "principle of fair play" naturally endorse a criterion of responsibility: to be entitled to a share of collective resources it is required that all else being equal one contribute to or "earn" their share of that collective resource. Indeed the logic of public good provision and resultant market failures assume certain property rights over consumption given particular levels of

contribution by individuals. A principle of equal reward in consumption for equal input has a prima facie level of normative appeal. (Ethics, public opinion)

Reasons for exclusion:

i) The 'solidaristic' foundation of the NHS provides reasons against holding people responsible for their own illness. (Ethics)
ii) Surveys are very mixed in their results and there is no clear majority in favour of including responsibility in this way. (Dolan et al 2005) (Public opinion)
iii) It can be very difficult to untangle genuine individual responsibility, due to complexities of causality and in theories of responsibility, freedom, etc. (Expert opinion)

Summary judgement on inclusion: **Red** - Note, however, that public preference regarding this issue is mixed, and given "media amplification" on responsibility, sentiment may change on this in the future.

IV.B.9. NHS responsibility

Definition: Some negative health outcomes can be traced to causes within the health system itself, such as hospital-acquired infections, medical negligence or misdiagnosis. The question arises of whether patients so affected should be given priority.

Reasons for inclusion:

i) The NICE Citizens council report *Departing From The Threshold* gives this close to highest priority (NICE Citizen's Council 2008) and preliminary results on this question from Brunel University and SVQ show sensitivity to weighting by NHS-cause of illness. (Public opinion)
ii) This consideration is very close to a notion of 'compensation for harm caused'. (Ethics)

Reasons for exclusion:

i) The cause of health loss should not matter. (Ethics)

Summary judgement on inclusion: **Green -** The argument that 'if the health system has caused your health problem, then it has a special responsibility to help' seems compelling, even though the cost will ultimately fall on other patients.[4]

IV.B.10.Immigration status

Definition: Different beneficiaries of the NHS might have different degrees of citizenship and longevity of stay, and hence have "paid into" the system to different degrees.

Reasons for inclusion:

i) It is a basic notion of fairness that those who have paid into a system should receive priority over those who have not. (Ethics)
ii) It is predicted that opinion surveys would support this criterion. (Predicted public opinion)

[4] We are aware that this judgement appears to conflict with the judgement given on individual responsibility above, where it was said that the cause of a condition should not affect whether one receives treatment. However in this case the NHS, which exists in order to take care of our health, has a special level of responsibility, and if it fails in that duty so badly that it causes illness in patients, then an exception to the general principle that causes should not matter seems justified

Reasons for exclusion:

i) It is not part of the NHS ethos that those who contribute most (for example in taxes) should get preferential treatment. (Expert judgement)
ii) This would be ruled out by anti-discrimination provisions. (Legal)
iii) It would be impossible to target immigration status through HTA. (Expert opinion)

Summary judgement on inclusion: **Red** - the reasons against appear very strong.

IV.C. Category III: Industrial

Industrial reasons will generally fall into two categories: first, those that provide beneficial incentives to the pharmaceutical industry, especially in terms of research and development; and second, those that provide beneficial effects for the UK economy as a whole. There has been a great deal of discussion regarding rewarding innovation in the UK through HTA, and this has been an important point of contention on the part of the pharmaceutical industry (Ferner, Hughes and Aronson, 2010; Goldman et al, 2010) in response to the Kennedy Report (Kennedy, 2009).

We need, however, to remain on guard for the possibility that "industrial" or "innovation" categories of value can be forms of double counting. This will be the case where innovation is encouraged because it will lead to health gain, but account is already taken of health gain elsewhere in the calculation. Where innovation is desired for more general economic reasons, double counting will not be an issue, but then the question will be whether spurring such innovation should be a cost to be funded from the health budget, and even if from the health budget whether this should take place through the HTA mechanism.

IV.C.1.Innovation 1: Dynamic efficiency

Definition: A programme of research may promise significant future benefits. It is sometimes suggested that treatments emerging from the programme at an early stage should be licenced at a cost above the threshold into to encourage a branch of research that may yield future beneficial and cost-effective treatments.

Reasons for inclusion

i) Encouraging research may lead to greater cost-effectiveness in the longer term, including, ultimately, the creation of generic drugs. (Expert opinion)

Reasons for exclusion:

i) It is not the business of the health allocation mechanism to pay for innovation: if this is to be done, it should be by means of dedicated research funding. (Policy)
ii) To divert funding in this way will be to favour future patients to the detriment current patients. (Expert opinion)
iii) In all areas of a modern market economies, risk taking, or innovation, is encouraged through the profit motive and the risks sometimes have an immediate payoff and sometimes a later pay-off. If a firm eventually realizes the gains from its innovation and risk taking it has no claim for extra compensation. To pay an "innovation premium" now and pay for the health value gained from that innovation at a later stage is to double count or pay twice for the same innovation. (Expert opinion)
iv) In those cases where no profit is ever obtained from a particular innovation, it is not clear that this is worth any kind of rectification by the public purse when similar

policies are not pursued in other areas of the economy (Claxton et al, 2009, Kanavos et al, 2010)). (Expert opinion)

Summary judgement on inclusion: **Amber** - It is a question of policy for the government whether the health research budget should be partly consolidated into the health budget directly, or through a health related "innovation fund" or kept entirely separate.

IV.C.2. Innovation 2: Generic markets

Definition: A 'generic market' is understood to be one where currently the best treatment for a condition is a cheap generic drug.

Reasons for inclusion:

i) Where the current best treatment is a generic it may be very difficult for a pharmaceutical company to show that a new treatment offers additional incremental benefits at a cost-effective price, even if the health benefits are very significant. The low price of the comparator makes the existing regime very cost-effective even if its effectiveness is low. Hence it may be that companies will be unwilling to take the financial risk of research and development in generic markets and therefore particular conditions for which generics are available will not gain the benefits of innovation. This is unfair to future patient groups. (Expert opinion)

Reasons for exclusion:

i) In principle this is no different from the case where there is no existing treatment. If a condition is severe, and a generic provides only a small health benefit, then the resulting situation is equivalent to one where there is no existing treatment for a moderately severe condition. In such a case the existence of the generic is not a significant barrier for innovation. If, on the other hand, the cheap generic provides a reasonable health gain, the treatment, in effect, converts a severe condition into a mild condition. In both cases – the generic market and the untreated condition - a (further) health gain is possible, but is likely to be expensive per QALY. But at the same time it is unclear why aiming for that further health gain should be a priority. (Expert opinion)

Summary judgement on inclusion: **Red** – It is accepted that the existence of a cheap generic can be a disincentive to pharmaceutical companies to target a particular condition. However if the potential incremental benefits are modest it is unclear why this should be a priority for the health service. If the incremental benefits are significant then ordinary cost-effectiveness analysis should provide sufficient incentives. Furthermore, if the condition remains severe even after treatment with the generic drug then severity weighting should provide a further incentive for innovation. But this is already included elsewhere in this analysis (see 1V.B.1).

IV.C.3. Promoting domestic industry and economic growth

Definition: Industry can relocate in response to changing demand for goods, and the NHS decision-making, can, in principle, have wider effects on the economy.

Reasons for inclusion:

i) There are sound economic reasons for taking macro-effects of NHS funding into account. (Precedent)

ii) If *costs and benefits* to other sectors are taken into account (see discussion of the societal perspective below) then increasing the aggregate budget size (through

presumed increased tax revenue) acts as a kind of *benefit* to other sectors, and should be considered. (Expert opinion)

Reasons for Exclusion:

i) It is not the business of the health allocation mechanism to stimulate the economy: if this is to be done it should be by means of dedicated investment funding. (Expert opinion)

ii) In practice it is very unlikely that the health allocation mechanism will have an effect on economic growth. (Expert opinion)

iii) Some practices of preference to domestic industry may violate international trade agreements. (Legal)

Summary judgement on inclusion: **Amber -** There is good reason to include this element only if a decision is made to fund economic development through the health allocation mechanism, that good evidence can be presented that such consequences are likely to follow, and doing so is not illegal. Although the issue of whether or not a separate innovation fund or allocation through HTA should be used to promote domestic industry is unresolved, *promoting domestic industry* is valuable under the societal perspective and could be considered.

IV.C.4.Patient Productivity

Definition: The illness of some patients will have greater consequential effect for the economy than others, especially those in their working years.

Reasons for Inclusion:

i) This consideration is already taken into account in calculating the global burden of disease using the DALY, (Precedent) and is consistent with at least one study of public opinion (Baker, Bateman, Donaldson et al 2008) Public Opinion.

ii) In some cases, such as the treatment of health workers in a health emergency, such policies will be of general public benefit. (Expert Opinion, Ethics)

Reasons for Exclusion:

i) Applied generally it is contrary to NICE SVJ anti-discrimination policy. (Legal)

ii) It violates the general solidaristic norm of equal treatment for equal need. (Ethics)

iii) Although there are good reasons for treating health workers first in cases of emergency, this can be justified in terms of the likely aggregate health gain, given that if they fall ill others will go untreated. Hence there is an element of double-counting. (Expert Opinion)

Summary judgement on inclusion: **Amber** - Applied generally this would be highly problematic, although restricted to health, and other essential, workers in times of emergency it appears defensible, provided considerations of double-counting are kept in mind.

IV.C.5. Orphan drugs

Definition: An orphan drug is defined in the EU as a drug to treat a condition with a prevalence of less than 5 per 10,000 of the population. Ultra-orphan conditions have a prevalence of less than 1 in 50,000 of the UK population (NICE Guidance on Orphan Drugs, 2006).

Reasons for inclusion:

i) Unless extra incentives are given to produce orphan drugs the industry will not invest in the area as it will not be profitable for them to do so, and rare conditions will be neglected. (Expert opinion)
ii) This consideration received a high degree of support from the NICE Citizen's Council *Departing from the Threshold* report, probably driven by great compassion for those suffering unusual threats to health. (Public opinion).
iii) The total budget impact of special provision for rare conditions is likely to be relatively low. (Expert opinion)

Reasons for exclusion:

i) There is no moral difference between a treatment that is expensive because research and development costs have to be recouped from a small patient population, and a treatment that is expensive for other reasons. Both, though matters of undeserved bad luck, should be treated the same way, and if a cost-effectiveness threshold is applied in one case, the same threshold should be applied in the other. (Ethics)
ii) Including the economic argument is a form of double-counting as this will be covered under the 'industrial heading'. Similar considerations apply to budgetary impact, and possible severity. (Expert opinion)

Summary judgement on inclusion: **Green –** There is an important difference between orphan drugs and other expensive treatments. As research and development costs need to be recouped then if there is no special treatment for orphan drugs rare conditions will never be researched. In other cases research may well be conducted and lead to cost-effective treatments, over time. Hence a principle of equal concern provides a strong justification for special consideration for orphan conditions.

IV.D. Category IV: Political Drivers

Government policy can override the normal health allocation mechanism. In some cases entrenched policy will need to be taken into account into future decisions. Here we indicate some of the major areas.

IV.D.1.National Priority Area

Definition: For policy reasons the government or other agency may declare a condition a national priority.

Reasons for inclusion:

i) Where an NPA has been defined it will be politically very difficult to refuse extra funds in such an area. (Policy)

Reasons for exclusion:

i) If there are good reasons for NPAs they will have already been covered by other considerations. (Expert judgement)

Summary judgement on inclusion: **Amber –** it would be politically very difficult not to follow such instructions.

IV.D.2.International Comparison

Definition: Certain treatments may be available in some countries that are considered relevant comparators to the UK health system.

Reasons for inclusion

i) It may be very difficult to resist pressure to keep up with what is made available in other similar economies. (Policy)

Reasons for exclusion:

i) If there are good reasons to refund the treatment they will have already been covered by other considerations, and the fact that another country might have reason for refund a treatment doesn't constitute a good reason for the UK. (Expert opinion)

Summary judgement on inclusion: **Amber -** There is good reason to make international comparisons as a type of 'check' on UK decision making, but generally these comparisons should be regarded as informative rather than precedents.

IV.D.3.Inter-Departmental Comparison

Definition: Government departments use conflicting approaches to the valuation of life and health, which sometimes leads to differing valuations.

Reasons for inclusion:

i) It seems that for reasons of fairness and consistency valuations should be the same throughout all government departments. (Ethics, policy)

Reasons for exclusion:

i) There is no reason for the NHS to follow valuations from other departments that may have been derived for other purposes using other methodologies, and may either be wrong or not appropriate for the context of the NHS. (Expert opinion)

Summary judgement on inclusion: **Amber -** Consistency between government departments is not an overriding goal where there are good reasons for differences. Although it may seem that a single approach should be adopted this is not current practice, and it can be argued that different contexts justify different approaches. Nevertheless, inconsistency in valuation of the same injury between departments, e.g., the DH valuing a minor injury at a different level than the DfT, suggests that money could be transferred from one department to another to reduce the overall incidence of minor injury (see Sunstein, 2002; and Wolff and Orr, 2009; on cross-departmental consistency)

IV.D.4. Budget Impact

Definition: Funding some treatments which meet the standard threshold may have a very significant effect on the overall budget and thereby crowd out other treatments (e.g. for example, economists within the Dept of Health have worried about the budgetary impact of licencing Viagra.). Note that budget impact might not only crowd out interventions with a lower QALY/£, but also might crowd out practices that are a basic feature of the NHS such as ordinary consultation with GPs.

Reasons for inclusion:

i) The system cannot cope with enormous drains of resources to supply very many people with a (collectively) expensive treatment especially when the benefits to any particular individual are relatively small. (Policy)

Reasons for exclusion:

i) If this situation occurs it can only show that the method of valuation is faulty (for example that severe conditions have been under-valued), for otherwise it should be acceptable that a greater value gain crowds out a lesser gain. (Expert judgement)
ii) To consider the size of the benefit is to make the judgement that the conditions in question are not severe. Hence this consideration will double-count severity. (Expert judgement)

Summary judgement on inclusion: **Amber** – Under VBP departmental budgeting priorities should generally reflect the value an intervention provides taking all other possible interventions into consideration, so budgetary impact should not be independently weighted. Nevertheless, the concern for budgetary impact in cases where a project's budget could displace possibly more cost-effective measures is a legitimate concern, especially in the management of transition, and so budget impact must be taken into account in some way.

IV.D.5. Uncertainty of outcome

Definition: Interventions have various ranges of success, or dose-response functions to which sensitivity analyses can be applied. Uncertainty of outcome will vary both within and across interventions and so levels of uncertainty must be accounted for.

Reasons for inclusion:

i) Where no gain is achieved this will be very costly to the NHS. Alternatively where great gains can sometimes be achieved this could be very cost-effective. (Expert opinion)

Reasons for exclusion:

i) This should already have been taken into account in arriving at estimates of expected benefit. (Expert opinion)
ii) Uncertainty cuts in both directions and it is unclear how it could be taken into account. (Expert opinion)

Summary judgement on inclusion: **Red –** Uncertainty is not a value to be weighted, but should be considered at the level of risk analysis, or probability of success in developing a technology. The value of uncertainty should be reflected in the value estimates ex ante, not weighted ex post.

IV.D.6. Stakeholder Persuasion

Definition: The force of public opinion on a particular treatment.

Reasons for inclusion

i) The NHS should be responsive to its stakeholders. (Ethics)

Reasons for exclusion:

i) Strength of preference, where based on good reasons, is already picked up by other measures, so there is a possibility of double-counting. (Expert opinion)

ii) Such a consideration opens up the possibility of external interference into the political process through lobbying by the pharmaceutical industry. (Expert judgement)

iii) This was universally rejected by the NICE Citizen's Council in their *Departing from the Threshold* report. (Public opinion)

Summary judgement on inclusion: **Red** – Stakeholder persuasion is rejected on grounds of equality: the ability of a group to "shout loudest" is not a normative reason for weighting**.**

IV.D.7.Cross-Department Effects

Definition: It is possible that an intervention could have effects elsewhere within governments. For example, a treatment regime may require lengthy absence from work, affecting welfare benefits. Or greater population health might significantly affect the number of people able to work.

Reasons for Inclusion:

(i) It would seem to be an aspect of 'joined-up' government to consider the wider consequences of any action. The view that the tax-payer does not distinguish between benefits or costs falling on different departments suggests that it is in the interest of the tax payer to consider such cross-sector effects, and this is certainly the view endorsed by the treasury. (Expert opinion, public opinion)

(ii) It would be arbitrary to exclude this consideration while including 'patient productivity' which is a non-health benefit of health for individuals. (Expert opinion)

Reasons for exclusion:

(i) Such effects are very hard to calculate. (Expert opinion)

(ii) Presently, the NHS only considers costs to the NHS and to the DSS. This is ultimately a matter of constitutional choice. (Expert opinion)

Summary judgement. **Amber** - Further consideration is necessary to see what this would come to in practice. And see V.D.3 on Interdepartmental comparisons.

V. The UCL List of Values

In the following, please note the colour coding of the summary judgments on each value:

- Green = Inclusion
- Amber = Possible inclusion
- Red = Exclusion

The UCL List of Values

Health and Well Being Gains

- Degree of life extension (QALY 1)
- Degree of life health gain (QALY 2)
- Impact on patient's well-being
- Impact on health of carer
- Impact on carers' well-being
- Unavailability of alternative treatment
- Impact on health gain of family and dependents
- Impact on well-being of family and dependents

- Leading to other definitive treatments

Prioritized Subgroups

- Severity of illness
- Pre-existing health state
- Life saving treatments
- Life extension near end of life
- Type of illness and "dread": Cancer
- Children and adolescents
- The socially disadvantaged
- Individual responsibility
- NHS responsibility
- Immigration status

Industrial

- Dynamic efficiency
- Generic markets
- Promoting Domestic Industry and Economic Growth
- Patient Productivity
- Orphan Drugs

Political Drivers

- National Priority Area
- International Comparison
- Inter-Departmental Comparison
- Budget Impact
- Uncertainty of outcome
- Stakeholder persuasion
- Cross-Departmental Effects

In the next stage of analysis, where possible methodologies are considered, it may become apparent that some of these judgments may need to be revised. New arguments may emerge, or technical factors may become more important. For example, it may be technically impossible to include a particular category, at which point every category marked red will need to be re-checked to ensure that the reasons for excluding it still apply. In particular if a category has been excluded on grounds of 'double counting' then this may no longer be relevant if the over-lapping category has been eliminated from the analysis. Hence the classification remains provisional, rather than definitive.

It is worth commenting briefly on how following the recommendations here would alter existing practice in terms of the factors that are included (as distinct from how they are weighted, which is the task for the next stage). Despite its central concern with the QALY, NICE takes pains to emphasise that its decisions are also influenced by social value judgments and the deliberations of the Citizens' Council. On examination, we note that the values labeled Green here are consistent with this approach. NICE evaluations have taken (or could take) into account: life extension; health gain; impact on carers' well-being; convenience and acceptability of treatment; severity of condition; socially disadvantaged groups; life-saving; life-extension; pre-existing health state; NHS responsibility and orphan drugs.

Indeed it is no surprise that there is this degree of convergence with NICE's actual practice, as NICE has made strenuous efforts to respond to expert and public opinion as well as the general legal

framework. The remaining challenge is to lay out a methodology in which all of these factors can be included in some sort of systematical fashion.

The amber categories on the current list require further deliberation or, in some cases, evidence sources. Further evidence would be very useful on the question of whether the public wish to give priority to children beyond the extra health gain that would result. It would also be very useful to know if there is empirical support for privileging the 'dreaded' condition of cancer, and those with rare conditions. In other cases, especially the 'industrial' amber categories, inclusion depends on a government decision of whether an innovation fund should be established (or whether the health budget should already be considered to have a research or industrial element). Other amber categories such as patient productivity may turn out, under the conditions specified, to have a very minor importance, and others, such as budget impact, may be more or less salient, depending on the details of the VBF scheme adopted. But once more, many of these considerations seem broadly consistent with NICE's direction of travel.

VI. Comparison between the UCL and the Pfizer List of Values

Here we explicitly compare the UCL list with the Pfizer list. We start by reproducing each list in full here:

The UCL List of Values

Health and Well Being Gains

- Degree of life extension (QALY 1)
- Degree of life health gain (QALY 2)
- Impact on patient's well-being
- Impact on health of carer
- Impact on carers' well-being
- Unavailability of alternative treatment
- Impact on health gain of family and dependents
- Impact on well-being of family and dependents
- Leading to other definitive treatments

Prioritized Subgroups

- Severity of illness
- Pre-existing health state
- Life saving treatments
- Life extension near end of life
- Type of illness and "dread": Cancer
- Children and adolescents
- The socially disadvantaged
- Individual responsibility
- NHS responsibility
- Immigration status

Industrial

- Dynamic efficiency
- Generic markets
- Promoting Domestic Industry and Economic Growth

- Patient Productivity
- Orphan Drugs

Political Drivers

- National Priority Area
- International Comparison
- Inter-Departmental Comparison
- Budget Impact
- Uncertainty of outcome
- Stakeholder persuasion
- Cross-Departmental Effects

The Pfizer List of Values

- Absolute health gain / therapeutic improvement, to individual patients and carer/dependents
  - Life years gained
  - QoL gained
- Relative improvement
  - Severity (baseline/final/alternative QoL level)
  - Avoiding sudden death (EoL and rule of rescue)
  - Avoiding premature death (fair innings)
    - Seemingly supported by new Outcomes Framework, but illegal?
  - Availability of (any/suitable) alternative therapy
- Patient preference
  - Process of care (eg; convenience, dignity, private cost)
  - Nature of condition/health outcomes (eg; cancer dread, HIV stigma, 'lifestyle' drugs)
- Population characteristics
  - Disadvantaged socio-economic
  - Children
  - Immigrants
  - Responsibility (eg; smokers)
- Societal perspective
  - Patient productivity
  - NHS priority TA
  - International comparison
- Industry and UK Plc
  - Innovation in generic, orphan markets
  - Dynamic efficiency

- Quality of evidence and certainty
- Affordable and implementable

VI.A. Common Ground and Significant Differences

Our preliminary account differs from the Pfizer model in some respects, although there are many similarities. Our groupings of considerations are not the same, and the individual criteria are in some cases different. The comparison is set out under the following headings: (i) Common Ground (ii) Significant Differences. No comment is made where the differences are insignificant or terminological.

VI.A.1. Common Ground

It is no surprise that both lists give priority to factors already commonly used:

- Life years gained i.e.; LY of QALY
- Health improvement i.e.; QoL, or QA of QALY

In both studies priority is also given to the following additional factors:

- Impact on carers ie; 3rd-party well-being
- Severity weighting ie; a QA adjuster.
- Avoiding sudden death/Life saving ie; LY adjusters.

- Process of Care/Well being of patient
- Orphan drugs

We agree on 'amber' rankings for:

- Children and adolescents
- Budget Impact
- Patient Productivity

We agree on 'red' rankings for:

- Immigration status
- Individual Responsibility
- Availability of Alternative Treatments

VI.A.2. Significant Differences

We give priority to the following, not included in the Pfizer account

- NHS Responsibility (Green)
- Promoting Domestic Industry (Amber)
- Interdepartmental Comparison (Amber)

We give higher priority than Pfizer to the following:

- Disadvantaged Social Groups (Green versus Amber)
- Dread (Amber versus Red)
- National Priority Area (Amber versus Red)
- International Comparison (Amber versus Red)

We give lower priority than Pfizer to:

- Certainty (Red versus Amber)
- Innovation, in particular for generic markets (various – straddles several categories)

VI.A.3. Cases of Non-overlap

There are also some elements ranked Red here that do not appear in the Pfizer list:

- Stakeholder persuasion

VI.A.4. Conclusion to Comparing UCL and Pfizer Lists

Some differences may reflect a difference in the use of colour coding. For us Green, at this stage, means 'very good reason to include', rather than 'must be included', and Amber 'reasonably good reason to include'. It may be that once the weighting exercise is done some elements will, for practical purposes, be reduced as their contribution to the exercise adds significant complications for little if any gain. At this stage however we have not undertaken that exercise. Furthermore, some of our Amber rankings really mean 'Green if a certain condition is met (e.g. budgets are increased to include a research element) but Red otherwise).

There are many clear cases where a value must be included (health gain) and those where it should be excluded (stakeholder persuasiveness). Several other categories, such as 'children' are rated amber because of uncertainties about the reasons why they have been included in previous accounts. In other cases further reflection is needed, and in yet other cases, whether a value can or should be included may well turn on the method of combining values at the next stage or how the list will eventually be used (for example what method of value based pricing is modelled). At this stage we have attempted to record, rather than resolve, uncertainty, and will take up these issues in further work to explore and explain them further.

VII. Next Steps

VII.A. Next Steps for Phase I

We should emphasize again that the list proposed here is provisional, and we are seeing this report as the first step in promoting a debate on value based pricing. We have made the first step of defining the values, and it can be argued we have already suggested implicit weights through the strength of our recommendations for each value. However, there is still uncertainty surrounding our implicit valuations, there is not perfect overlap between the UCL list and the Pfizer list. Therefore, the next stage of research should undertake further reflection of the list of values.

VII.B. Next Steps for Phase II: Understanding the Varieties of Methods for Trading Off Values

VII.B.1. The welfare economic model: Eliciting public preferences

Here one can derive values for each parameter by surveying public and taking averages, in particular willingness-to-pay, and then use such figures to set values for trading parameters against each other. However, there are a number of known difficulties with such methods. Different elicitation models lead to different results, even within the same study.

Further, even if there are stable preferences they are likely to differ between people, and this raises questions of procedural justice regarding preference aggregation. It is very unclear that there is any justification for settling conflicts of values by taking an average. For example in the political process we settle by majority decision not averaging, least of all averaging strength of preference. Some parameters do not seem to sit easily with the notion of formal trade-offs. Do we want to say that there is some fixed quantity of total health gain for which we will abandon equality, for example? While it is possible to do this, it seems somehow to betray the notion of equality.

VII.B.2.The decision analysis model: Maximization subject to constraints

The natural alternative is to say that some values – health gain, life extension – lend themselves to quantification and formal trade-offs in the search to maximize value, others, such as equality, set some constraints against which this maximization takes place. However this too has its problems. While, to use the example given above, there may be no fixed total of health gain for which, we will say in advance, we will abandon equality, the truth is that if the health gain is significant we probably will give up equality. Hence the notion of strict constraints seems just as unhelpful as a precise conversion rate. It may be, therefore, that if a formal analysis is needed, some parameters can be given point values and some range values. In fortunate cases, a sensitivity analysis may reveal that the same decision would be made whatever the values, within the range. However, we cannot

assume that all cases will be of this nature, and so some other approach will be necessary to supplement it.

VII.B.3. The judicial model: Coherence in legal reasoning

One area in which value disputes are regularly resolved is that of legal, and more precisely, judicial reasoning. Many cases go to court precisely because there is a clash of values, or a disagreement about which of several reasons has higher weighting. Courts do not have a formal algorithm for settling disputes: they do not try to maximize economic value, for example, even if it is true that a good deal of commercial law exists in order to facilitate ease of trade. Yet courts seem to have achieved a situation in which judgements can be recognised as good or bad (and subject to appeal) and as following rational methods, of argument, evaluation and use of precedent. This seems a promising line of investigation for further development of MCDA given the difficulties outlined for purely formal methods.

VII.B.4. Conclusion to Next Steps for Phase II: Algorithms versus Deliberation

Much of the critical literature on VBP and in the wake of the Kennedy report focuses on the idea that many of the values, social values in particular, are perhaps vague and difficult to quantify. As a consequence there is skepticism about making fair, transparent and accountable decisions with such social values. Kennedy claims that attempting to make precise social values would be an "exercise in spurious numerical (un)certainty" (Kennedy 2009). The fear is that incorporating such values will inevitably be ad hoc.

The response to such fears is partly to admit the problem. Values of equity, compassion, efficiency, desert, and the like, are certainly difficult to quantify and trade off. But there is a standard reply that if such values are to be traded off it is all the more important that effort be put into doing so well, and not just "taken into account". Otherwise the "difficult to quantify" values will be overlooked and those values which are more amenable to quantification will be included to the detriment of other values.

Another issue we do not address here but will be crucial for further work will be the trade-off between the completeness of a list and the information required to make valuations on each value against the need for simplicity in implementation and perhaps also for accountability. Of course in an MCDA there is already trading off between issues of implementation/feasibility, transparency, completeness and public accountability.

VII.C. Practical Questions for Phase II

In the Department of Health's consultation on value-based approach to pricing, a pricing methodology is outlined in which, in the first instance, the cost-per-QALY of the treatment under consideration is calculated and then various adjustments for such things as 'burden of illness' and 'innovation' are then introduced to provide justifications for higher cost thresholds (p. 13).

While this has considerable merit of simplicity and continuity, it is worth noting that there are at least two methodological issues in need of discussion.

First, the proposed methodology takes the notion of the QALY as unproblematic. However the potential move to MCDA provides the opportunity to look again at the two elements of the QALY – life extension and health improvement – and to consider whether they should be traded off according to the constant function assumed within the QALY methodology. There is an empirical

question as to whether people will consistently make the tradeoffs between life years and quality of life predicted of them by the QALY.

Second, in a multi-criteria decision analysis there is no particular reason why any of the criteria should be afforded the privilege given to the QALY in this proposal. Of course, it is likely that the QALY will be given high weight relative to other factors, but the weighting should emerge from the process, rather than be presumed from the start. That is, the adoption of MCDA allows the analyst to select other models besides assuming that the QALY must be the "currency" to be weighted and modified by various social judgments, although whether there needs to be common currency and how to define social weightings through preference elicitation methods are still open questions. Hence initially all factors should be treated on a par, rather than some providing a baseline and others treated as modifiers. In practice, however, this may make little, if any, difference, and so there could be pragmatic reasons for accepting the approach sketched by the Department of Health.

VIII. Conclusion: Interim Recommendations for Inclusion

To summarize our position here, we put forward a short list of recommended values. We have produced this by simply removing all of those values which are given a red value and included those with amber or green. We expect that this recommended list will be modified in light of further input from readers and further research.

With that caveat in mind, we conclude by recommending the following list of values for inclusion in VBP:

Health and Well Being Gains

- Degree of life extension (QALY 1)
- Degree of life health gain (QALY 2)
- Impact on patient's well-being
- Impact on health of carer
- Impact on carers' well-being

Prioritized Subgroups

- Severity of illness
- Pre-existing health state
- Life saving treatments
- Life extension near end of life
- Type of illness and "dread": Cancer
- Children and adolescents
- The socially disadvantaged
- NHS responsibility

Industrial

- Dynamic efficiency
- Promoting Domestic Industry and Economic Growth
- Patient Productivity
- Orphan Drugs

Political Drivers

- National Priority Area
- International Comparison

- Budget Impact
- Cross-Departmental Effects

In going beyond the list to a decision, it is clear that each of the models suggested above have much to recommend them:

- the welfare economic model emphasizes respecting individual preferences and the fact that willingness-to-pay should inform decisions about taxation and public spending.
- The decision analysis model attempts to optimally balance objectives given constraints in a mathematical formulation
- The judicial model attempts to find consistency in reasoning about conflicts of principles and values

Decision making authorities employing VBP will need to employ the resources of each of these disciplines in making their decisions. Future work will explore how such decisions might be made. The list presented here will surely be refined in light of this future work.

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