NUFFIELD COUNCIL ON BIOETHICS

BACKGROUND PAPER

Hyper-expensive treatments

David Hunter, Centre for Professional Ethics, Keele University and James Wilson, Comprehensive Biomedical Research Centre and Centre for Philosophy, Justice and Health, University College London

Forward Look
19-20 May 2011

Note
The authors were commissioned by the Nuffield Council on Bioethics to write this paper in order to inform the Council's discussions about possible future work on this topic. The paper is intended to provide an overview of key clinical, ethical, social, legal and policy issues, but is not intended to offer any conclusions or recommendations regarding future policy and practice. Any views expressed in the paper are the views of the authors and not those of the Nuffield Council on Bioethics.

NUFFIELD COUNCIL ON BIOETHICS

Forward Look
19-20 May 2011

Hyper-expensive treatments

Background paper

David Hunter, Centre for Professional Ethics, Keele University
James Wilson, Comprehensive Biomedical Research Centre and Centre for Philosophy, Justice and Health, University College London

Summary

1This background paper provides a summary of the ethical arguments and policy issues which arise in considering very expensive medical treatments and their place within a fixed healthcare budget such as the NHS.

Introduction and background

Not all potentially available healthcare can be provided

2The NHS budget has been growing at an average of 4% per year in real terms since its inception, and grew at double this rate under the Blair government from 2000 onwards.[1] This did not prevent scarcities of healthcare resources. Indeed persistent and predicted continuing scarcity of healthcare resources was amongst the reason that the National Institute for Health and Clinical Excellence (NICE) was set up. The continual rise in healthcare costs has complex and mutually interlocking causes: in part it is due to the epidemiological shift in causes of death from infectious diseases to chronic diseases, in part it is simply because people are living longer, and perhaps most importantly in our context, it is because the benefits provided by medical research. In the United States for example, in 1959, the median age of survival of children with cystic fibrosis was 6 months, now it is 36.8 years. (Cystic Fibrosis Association, 2006) This is clearly a great achievement of medical research and provision, but one that has been possible only by expending a vast amount more on healthcare. The level of health care that could be provided is constantly changing, and the amount that could be spent is increasing. Current financial austerity has made this problem much more severe but it has not created it.

3 A regular reaction when faced with the prospect of healthcare rationing is that healthcare rationing is immoral, and that there is an obligation to provide healthcare to everyone who needs it regardless of expense (Hunter 2009). On such a view, if there is scarcity of healthcare resources this is because we are currently not

[1] http://www.nhs.uk/NHSEngland/thenhs/about/Pages/overview.aspx

spending enough, and if we did, everyone would have the all the care they need. On this view, we could, and should, make healthcare resources abundant. It is widely thought that rationing healthcare is more morally problematic than rationing other commodities, because whenever a healthcare system denies treatment to someone on the grounds of cost "we deny benefits to some individuals who can plausibly claim they are owed them in principle; losers as well as winners have plausible claims to have their needs met". (Daniels, 1994, p.27). However, there is widespread scepticism of the claim that it is feasible to raise healthcare budgets to such an extent that rationing is not required, and the case has been made that healthcare should not be treated as a "bottomless pit" to the detriment of other social goods (Dworkin 2000). On the most prevalent view, some form of healthcare rationing must be taken as a given: what is required is a fair way of distributing treatments given that it will not be possible to provide treatment for everyone who needs treatment.

Hyper-expensive treatments

4 This briefing paper focuses on treatments that have a very high cost – or hyper-expensive treatments. In this paper, the main examples used are drugs, but in principle, several issues could relate to other treatments as well, such as e.g. surgery. The paper directs most of its attention more specifically to treatments – drugs – which are not only hyper-expensive, but are also very expensive relative to the amount of health benefit they provide: in other words treatments which are both expensive and cost-ineffective.2 Providing medical treatments which are very expensive in absolute terms but also provide a very large medical benefit has not usually been thought particularly morally problematic.3 Whether high cost treatments which provide high medical returns should be subject to further moral scrutiny is an open question which we return to in paragraphs 31-36.

5 Hyper-expensive treatments are important to focus on as an emerging question in bioethics for two reasons: first, they provide a clear, focused and continuing flashpoint for debates about the rationing of medical treatment, and second, we can expect the numbers of such treatments to rise over the next few years. Such treatments may consume an increasing proportion of NHS budgets unless cost containment measures are taken.

6 Many hyper-expensive treatments will be for rare conditions (or "orphan diseases"): examples would be of Enzyme Replacement Therapy for Gaucher's disease or for Pompe's disease.[4] However orphan diseases are arguably not such a great problem: they are by definition of low prevalence, and so even if each individual person with the orphan condition is very expensive to treat, the overall outlay will not be excessive. What is more challenging from a cost perspective are drugs for conditions of a higher prevalence than orphan conditions, but which are nonetheless very

---

2 Cheap treatments can also be highly cost-ineffective: the only thing that matters for cost-effectiveness is the ratio of the cost of the treatment to the benefit it provides.

3 An exception to this are transplantations, which have matured into highly effective yet very expensive treatments and which came under significant moral scrutiny because of their methodology, their cost and the scarcity of organs when they were first introduced into wider clinical practice.

4 In the EU the official definition of an orphan disease is one which has a prevalence of less than 5 persons in 10,000 in the European Union. (European Parliament and Council Regulation (EC) No 141/2000.) It is estimated that there are between 6000 and 7000 rare diseases which meet the EU criteria, with about five new ones being added to the medical literature every week.

expensive. Avastin (bevacizumab), a drug for the treatment of colorectal cancer, provides a good example of this kind of hyper-expensive treatment. NICE estimated that 6,500 people per year would be eligible for the drug, and that it would cost £20,800 per patient, so the total cost would £135 million per year. (NICE 2010) When used as a first-line treatment, Avastin increases overall average survival by 1.4 months when compared to the current standard of care (XELOX and FOLFOX-4). When used as a second line treatment, Avastin increases overall survival by 2.2 months. (NICE 2010) The total NHS drugs budget is £11billion per year, and so funding Avastin alone would be expected to make up more than 1% of the current NHS drugs budget.

The idea of an opportunity cost

7 Perhaps the most fundamental concept in discussing fair allocation of healthcare resources is that of an *opportunity cost.* The opportunity cost of a choice is what one must give up in order to make that choice. When we are allocating costs out of a fixed and limited healthcare budget, then money spent on one treatment is money that cannot be spent on something else. If we take the case of Avastin, the opportunity cost of providing this drug on the NHS at a cost of £135 million per year is the medical benefits that we could provide if we were to spend this £135 million on something else. This £135 million could provide sizable health benefits for others.

Why are some treatments hyper-expensive?

8 This section gives background on the economics of drug pricing: it explains why it is necessary to provide patents as incentives for pharmaceutical innovation; how a patent system allows companies to charge very high prices for patented goods; and gives a brief overview of the Pharmaceutical Price Regulation Scheme, which is currently used to regulate drug prices in the UK, and its proposed successor, Value Based Pricing. There are broadly three factors that contribute to the existence of hyper-expensive drugs, each of which will briefly be explored below.

- Monopoly pricing based on patenting
- Cost of research and development (R&D)
- Cost of Production

Patents as a way of incentivising treatment development

9 Drugs are what economists call public goods, in that they are non-rival and non-excludable goods (non-rival means that one person's use does not interfere with another person's use of the product; non-excludable means that it is difficult to prevent the use of a product (i.e. drug formula) without permission). Standard economic theory (and much of real life experience) tells us that, unless we do something to incentivise their production we should expect an underproduction of public goods. It would be irrational (in self-interested terms) for a developer to expend her time and money creating a public good, given that everyone else will be able to benefit from the public good as much as her. It is easier to allow someone else to do the hard work, and then take a free ride on their efforts. But of course, it will tend to be irrational for anyone else to put the effort in either; and so there is a

severe risk of under-creation of such goods. Even where such goods are produced, it will usually be rational for the inventor to try to keep the underlying processes and ideas secret, so that she can reap an advantage for her work.[5]

10 Drug discovery is an expensive process: if we include the costs of pharmaceutical companies' failures and marketing, the cost of bringing a new drug to market is estimated to be $802 million.[6] An adequate amount of drug development is very unlikely without the introduction of incentives. Patents aim to solve the problem of underprovision by making patented inventions *excludable* and *public.* Provision to exclude others from the good is an incentive to do the necessary research and development to create useful new inventions, because it ensures recouping development costs (and return a profit) by charging others for access to the good. In order to gain a patent, the patent holder has to share the underlying knowledge of how the process or product can be made with everyone, thus avoiding the problem of secrecy.

[5] In the past there have been some quite significant cases of the withholding of medical information tied to this problem. Most famously, the Chamberlen family kept the discovery of the obstetrics forceps secret for more than 100 years, in order to protect their midwifery business. (See Moore 2007).

[6] This figure is from a widely cited report by DiMasi, Hansen and Grabowski (2003). Adams and Brantner (2006) found a wide variance between $500 million to over $2 billion, depending on product drug developed, and the developing firm.

11 A patent is a legalised temporary monopoly. Monopolies are in general frowned upon by economists because of the power the monopoly holder has to extract economic rent from those who buy the product. In a competitive market, prices are kept down by competition: companies will seek to differentiate themselves in the market by offering goods either at a higher quality, or a lower price, with the net result that (in an efficient market) profit margins are low. Where we have a monopoly, there is no reason to think that the price charged for a good will bear any relationship to the marginal cost of production. This point is worth bearing in mind when we think about hyper-expensive drugs: one reason why a particular hyper-expensive treatment has such a high price might be that this is a price drug companies feel that market will bear it, rather than this being the price that is necessary for the company to recover its research and development costs. This issue has recently become very heated in relation to the pricing of orphan drugs, with a special issue of the BMJ devoted to it in 2010. When BioMarin was awarded a European orphan licence for amifampridine (Firdapse), "a slightly modified version of 3,4-diaminopyridine, which is unlicensed but has been used for more than 20 years to treat two rare diseases, Lambert Eaton myasthenic syndrome (LEMS) and congenital myasthenic syndrome," price rises were enormous. Treatment of a patient with diaminopyridine cost £800-£1000 per year, but BioMarin charged £40 000-£70 000 for amifampridine. (Hawkes and Cohen 2010). As the BMJ editorial put it, "a company needs only to find an unlicensed drug and license it for use in a rare condition, citing little more than pre-existing evidence of its use in clinical practice. With minor adjustments to the product and new packaging, a modestly priced drug suddenly becomes unaffordable." (Godlee 2010) So one ethical question is: are some drug companies abusing their monopoly position to charge unjustifiably high prices?

Treatment Development Costs

12 Drug discovery and production is an immensely complex process. For the purposes of this paper it can be split into two questions: how much does it cost to make the first pill? And how much does it cost to make the next pill? As noted, the best estimate for how much it costs to produce the first pill is $802 million. (DiMasi, Hansen and Grabowski (2003). Whilst manufacturing costs differ for different drugs, it is universally the case that the marginal cost of production of a patented drug is only a small fraction of its sale cost. Companies need to sell each pill at a cost much higher than the marginal cost of production in order to recoup their research and development costs, and return a profit. Whilst the patent term is 20 years, companies file their patent claim early in the drug development process. It takes between 8-13 years from the filing date to the point at which the drug actually becomes available for sale.[7] The net result is that once a new drug comes onto the market and is available for sale, the effective patent term will be somewhere between 7-12 years. From the point that a generic is available, the branded drug will become much less profitable for the company who developed it. Hence pharmaceutical companies aim to recoup the costs of drug development and earn their profits in the effective patent time window. Inevitably the prices of patented drugs must be vastly greater than their marginal cost of production. All this means that determining what counts as a fair

[7] This period is composed of the clinical research and development phase (2–10 years), with an average of 5 years, and gaining approval from the relevant national drug regulator such as the FDA, or MHRA (2 months–7 years), with an average of 2 years. For an overview, see Dickson and Gagnon (2004).

price for a drug is fraught with difficulty. Is it fair for drug companies to seek to maximise their profits by charging whatever prices they think the market will bear? Or should there be some a requirement that drug companies can only charge prices that are 'reasonable', or that relate to the effects of a drug?

13 In the UK, prices of branded medicines have been regulated by the Pharmaceutical Price Regulation Scheme (PPRS) since 1957. PPRS is a voluntary agreement between the Department of Health and the pharmaceutical industry.[8] It has typically been renegotiated every five years (most recently in 2009), and aims to strike a fair balance between allowing companies to make a reasonable profit, and obtaining reasonable prices for the NHS.[9] (DOH 2009)

14 This process has been more recently thought to be problematic because "freedom of pricing for new drugs puts the NHS in the position of either having to pay high prices that are not always justified by the benefits of a new drug, or having to restrict access." (DOH, 2010) Under the proposed replacement, Value Based Pricing, the government would set out what it is willing to pay for certain kinds of drugs on the basis of their social value, and manufacturers would respond to these pricing signals.

Cost of Treatment Production

15 While, as noted above, the cost of production of drugs is often marginal compared to the cost of R&D related to establishing a new treatment, in some cases treatments might be hyper-expensive simply because the costs of production for individual treatments, not including R&D expenses, are extremely high. This may increasingly be the case as more individually targeted treatments are developed, and when treatments beyond the boundaries of pharmaceutical agents are considered. (Nuffield Council, 2003) For example, more 'exotic' health interventions that are being researched such as stem cell therapies could in principle be very expensive treatments purely on production costs alone, at least initially.

QALYS as a Measure of Health Benefit

16 A key element when assessing healthcare resources is measuring and comparing the healthcare benefits that can be obtained from different interventions. Whilst there are other ways of measuring health benefit,[10] the Quality Adjusted Life Year (QALY) is the one currently most used (including by NICE). The use of QALYs is intended to capture not only the impact of treatments on mortality but also on morbidity. One year of healthy life is one QALY, whilst a year of unhealthy life is worth less than one QALY. In order to determine how much less, health economists use a two stage process to determine the QALY score for each condition (classification of health states according to quality of life, and scoring/rating particular health states). The QALY methodology presupposes that health benefits can be summed and compared across individuals.

---

8 The Secretary of State has statutory powers to act against companies who do not sign up

9 The PPRS works by setting a target return on capital (ROC), currently 21%, and a margin of tolerance around this (140%) of the ROC target. Any profit above and beyond the margin of tolerance is repayable to the Department of Health. Conversely, if a company's profits are below 40% of the ROC target, they can apply for a price increase.

10 For a good overview of the terrain, see Gold, Stevenson and Fryback (2002).

QALYs and conceptual problems

17 There are some unresolved conceptual problems in measuring QALYs. First, there is the problem of adaptation effects: evaluations regarding the severity of particular health state differ between those who are in that state and are used to it and those who just imagine being affected. Someone who is thinking about what it would be like to be a wheelchair user may well rate this state as worse than the person who has adapted to this life. This raises a deep methodological question: whose view of how bad the condition is to be in should we take for our public policy purposes in measuring health—those who have adapted to the condition, or those who are merely imagining what it would be like?[11] Second, there is the fact that QALYs only measure *health* benefit, and so are difficult to use to compute how we should measure health gains against other benefits. There is a potential risk that QALYs do not take proper account of non-health benefits of treatment, as is examined further in paragraph 30.

18 Moreover, QALYs provide a measure of health benefit. With regard to that, the QALY methodology commits us to the claim that the option which generates the most QALYs generates the greatest health benefit. However, using QALYs to measure health benefit does not commit us to the claim that the goal of a health system should be to maximise the number of QALYs. NICE is explicit that maximising QALY cost-effectiveness is only one of the values that it brings to bear on is decisionmaking process. Other principles it adheres to are set out in its *Social Value Judgements* document.[12] However, the selection of such additional values is controversial.

19 Despite the fact that the QALY presents various problems as a measure of health benefit, there is currently no less controversial way of measuring health benefit.

Cost effectiveness

20 Given both the cost of a particular treatment, and an account of how many QALYs the treatment will provide to the reference class of patients, it is simple to work out how much the treatment costs per QALY gained. When NICE appraises new drugs it is primarily interested in incremental cost effectiveness ratios: that is comparing the cost per QALY of a new treatment to the standard treatment. The kinds of hyper-expensive treatment focused on here will have an incremental cost-effectiveness ratio of well over £30,000 per QALY.

21 Treatments can lack cost effectiveness in a variety of ways. Firstly they might simply have positive but minimal effects for all of the patients who are prescribed them such that despite being marginally good for the patients the cost of the treatment means that NICE does not approve them. The effects of the treatment might also be unevenly distributed within the patient group, such that some patients benefit greatly from the treatment but the majority shows no benefit at all. Hence these treatments, while not cost-effective at the reference class level, would be cost-effective if the individual patients who would benefit could be identified and the reference class thus refined.

---

[11] See Schwartz (2005) for a good overview of this literature.

[12] http://www.nice.org.uk/aboutnice/howwework/socialvaluejudgements/socialvaluejudgements.jsp

22 In addition there is a concern that measuring the cost-effectiveness of hyper-expensive treatments solely in terms of cost per QALY generated may miss something significant about the value of providing them. For instance carers for those with Alzheimer's disease consistently argued against the NICE ruling on Aricept that the improvement that the drug provided, whilst small in QALY terms, was significant in other terms: as one carer put it, "Aricept doesn't prolong life but it masks the symptoms, so that more of the person's personality is retained. They are more of the person that they were for longer, and for a relative or a carer – a wife, husband, son or daughter – that's massive, because Alzheimer's pulls on your heartstrings, because you witness the decline of your loved one."[13]

Ethical issues: Arguments against providing hyper-expensive treatments

The value of health

23 Many of the ethical objections to high cost treatments are on the basis of their relatively weak cost effectiveness when compared to other, less expensive treatments. However, there may be distinctive ethical issues raised by treatments which are high cost but also highly effective – for example, if end stage cancer drug treatments were developed that extended life reliably beyond the aforementioned example of Avastin. If these drugs were priced as antibody cancer treatments are priced today and they were available on the NHS, this would have significant impact on drug spending.

24 The first ethical issue arising in this context is a broader, 'macro' question of how much value should be placed on health as opposed to other goods that society might expend public funds on – that is how much funding should be available for treatments, since it would be possible to provide more end stage cancer treatments by sacrificing other public goods like education. It has been argued by some that health deserves special priority. (Daniels, 2008) In contrast, others have argued that given the interconnectedness of health and other public goods impacting on health, it does not make sense to give special priority to healthcare, even if we give priority to health. (Segall, 2010; Wilson 2009)

Aggregate cost and fairness

25 The second issue is that of how to deal with health care allocation when it is impossible to provide a treatment to all who would benefit from it. Given the number of cancer patients in Britain, it will very difficult to provide life-extending end stage treatments to all who would benefit because of sheer cost. This raises questions of fairness. Who should receive the treatment, and why? How should relative benefits be weighed? And how should decision making work at the 'micro' level of individual patients and patient groups?

Solidarity

[13] http://www.guardian.co.uk/politics/2010/oct/06/alzheimers-drugs-nhs-government

26 The final issue that is raised is the question of solidarity and the value of the putative values of the NHS. These are often expressed in sentiments such as “high quality treatments for all”. It might be thought that on these grounds, despite of their cost effectiveness the introduction of novel end stage cancer treatments ought to be resisted unless they can be funded for all who could benefit from it.

Low cost effectiveness

27 Most hyper-expensive treatments are of low cost effectiveness. The majority of ethical objections to providing hyper-expensive treatments are based on the fact that a healthcare system would be able to provide more benefits elsewhere for the same cost. When a healthcare system chooses to fund a low cost-effectiveness treatment over a more cost-effective one, the live-years saved will be outweighed by those that could have been saved doing something else. Allowing low cost effectiveness treatments would appear to be immoral from the perspective of maximising consequentialism – as we would deliberately be doing less good than we could be.

28 However maximising consequentialism is controversial as an overall moral outlook,[14] and adopting maximisation of QALY cost effectiveness as the only principle of distribution would have some highly counterintuitive results. In the late 1980s the Oregon Health Services Commission attempted to draw up a list of priorities for Medicaid provision. The initial priorities list was drawn up on the basis of cost effectiveness analysis, and contained a number of strange results: capping teeth was ranked as higher priority than appendectomy (because it was more cost-effective in QALY terms).[15] If a healthcare system were to take QALY maximisation as its only goal it would not just be hyper-expensive treatments which it would have to give up on, but also *any* treatment which was less than optimally cost-effective: this would mean that many areas of medical care, such as palliative care, which do not generate many QALYs for their cost, would have to be dropped.[16]

Better alternatives?

29 Clinical care is sometimes compared to an ambulance at the bottom of a cliff, while public health is compared to a fence at the top of the cliff. Some argue that a focus on hyper-expensive treatments would inappropriately focus attention on clinical endeavours and indirectly threaten other forms of health care such as public health and interventions in things like the social determinants of health – which while not

---

[14] Maximising consequentialism is the name given to the class of moral theories which hold that that the only thing that matters is the *consequences* of actions, and that hence the right thing to do is to perform the action that *promotes the best consequences*, impartially considered. The largest challenge for maximising consequentialism to overcome is what John Rawls (1999) called the “separateness of persons objection”: at the deepest level the consequentialist does not believe that it is people who matter, but rather the amount of wellbeing in the universe. The amount of wellbeing in the universe can sometimes be increased by means which seem to be intuitively immoral.

[15] Moreover, a policy of maximising the number of QALYs has been argued to be ageist: if we think about an intervention such as a hip replacement which can provide health benefits for a period of fifteen years, we will generate more expected QALYs if we give the intervention to someone who is expected to survive for a further fifteen years, than if we give the intervention to someone who will only be expected to survive for another three years.

[16] For more on palliative care and QALYs, see Hughes 2005.

clinical might prevent both far greater harms, but also the need for the clinical intervention in the first place.[17] (Mann, 1997; Marmot, 2005)

Discrimination

30 Some positions endorse the claim that providing hyper-expensive treatments of low cost effectiveness is morally wrong – at least in certain circumstances – because it amounts to unfair discrimination in favour of those who have expensive-to-treat conditions. Healthcare systems are faced with a situation where they cannot meet everyone's medical needs: whatever they do, someone's medical needs must go unmet. Proponents of the argument from discrimination ask if there is reason to think that treating people who have a condition which requires a hyper-expensive treatment is *per se* morally more urgent than those who have cheaper to treat conditions. If morally speaking, there is no reason to think that patients who require hyper-expensive treatments have more morally urgent claims simply in virtue of the fact that their condition is expensive to treat, they argue that the decision to save a fewer number with a hyper-expensive condition rather than the larger number of people with a cheaper to treat condition amounts to wrongful discrimination against those with cheaper to treat conditions.

31 A key question which underlies this argument is: what does it mean to treat people as equals when it comes to the allocation of scarce healthcare resources? On one reading we treat people as equals by giving equal priority to claims to medical treatment of equal moral urgency, where the moral urgency of a claim to treatment is treated as wholly separate from the question of much it would cost to fulfil that claim to treatment.

32 However, this is not the only way to understand the value of equality in this context: those who think that we *should* provide hyper-expensive treatments also appeal to the value of equality – though in a number of different ways, as is discussed in the next section.

Ethical issues: Arguments in favour of providing hyper-expensive treatments

Arbitrariness of costs

33 One way to argue that the value of equality supports paying for hyper-expensive treatments, rather than opposes it, appeals to the claim that the fact that one condition can be treated cost effectively whilst another cannot is arbitrary from the moral point of view. On such a view, to treat people as equals is to avoid giving one preference over another for morally arbitrary reasons. On this view, the fact that the people with condition A require 10 times more resources for their condition to be treated than people with condition B is a matter of bad luck for the people with condition A. When people have a disability and are poor 'converters' of resources into wellbeing, it is generally thought that what they need is a greater share of

[17] The social determinants of health hypothesis is that social factors such as relative income inequalities have profound effects on health outcomes, and is based largely on research such as the Whitehall study. (Marmot, 1991)

resources so that they can be brought up to the same level of opportunity for welfare as others. Applying the same logic, we could argue that the fact that the person with the expensive to treat condition is a poor converter of resources into QALYs should not be a reason to abandon them. Refusing to do so might amount to saying that we do not care about *people* in our health care system, but just about cost effectiveness.[18]

34 Ronald Dworkin makes a helpful distinction between (a) the right to equal treatment, "which is the right to an equal distribution of some opportunity or resource or burden" and (b) the right to treatment as an equal, "which is the right, not to receive the same distribution of some burden or benefit, but to be treated with the same respect and concern as anyone else." He argues that it is the right to treatment as an equal which is more fundamental: "If I have two children, and one is dying from a disease that is making the other uncomfortable, I do not show equal concern if I flip a coin to decide which should have the remaining dose of a drug. This example shows that the right to treatment as an equal is fundamental, and the right to equal treatment, derivative." (Dworkin 1977, p. 227)

Rule of rescue

35 It is often argued that there is a special moral obligation to save those who are in peril even though more good could be done if we were to deploy our resources more prudently. Albert Jonsen christened this response to such cases the *Rule of Rescue*:

> Our moral response to the imminence of death demands that we rescue the doomed. We throw a rope to the drowning, rush into burning buildings to snatch the entrapped, dispatch teams to search for the snowbound. This rescue morality spills over into medical care, where our ropes are artificial hearts, our rush is the mobile critical care unit, our teams are the transplant services. The imperative to rescue is, undoubtedly, of great moral significance; but the imperative seems to grow into a compulsion, more instinctive than rational. (Jonsen, 1986, p. 174)

36 The rule of rescue would support paying for hyper-expensive treatments only in certain circumstances: whilst some or many of the people who could benefit from hyper-expensive drugs will be in a situation calling for rescue, not all will. The normative cogency of the rule of rescue is contested: intuitions about urgency and rescue are heavily affected by factors which seem to be morally arbitrary. (Jenni and Loewenstein 1997; McKie and Richardson 2003) For instance, they are more likely to be triggered by a large percentage of a small group in peril than a smaller percentage of a larger group. They are triggered by identifiable individuals (such as a group of trapped miners) rather than statistical lives (such as the numbers of miners who could be saved if we were to put in place better safety arrangements for the future).[19] If one person's plight is made salient, then people will feel sympathy for them, and want to help them. However, other people whose plight has not been made salient

[18] For this argument, see Gericke, Riesberg and Busse, 2005, p.165: "many would uphold that society has a moral obligation not to abandon individuals who have had the bad luck to be affected by a serious but rare condition for which no treatment exists".

[19] This is something that charities have learned to use to their advantage: people will give more if they are asked to help a single child than to help many people thousands who are suffering.

will often have equally as strong, if not stronger, claims to aid. Michael Rawlins, the Chair of NICE, explained NICE's uneasiness with the rule of rescue by saying that its goal must be "to be fair to all the patients in the National Health Service, not just the patients with macular degeneration or breast cancer or renal cancer. If we spend a lot of money on a few patients, we have less money to spend on everyone else. We are not trying to be unkind or cruel. We are trying to look after everybody." (quoted in Steinbrook 2008).

Priority to the worst off

37 Many accounts of justice argue that we should give priority to those who are worst off. (Daniels, 2008) Such accounts of justice provide some support for paying for hyper-expensive treatments, insofar as many hyper-expensive low cost effectiveness treatments are for end-stage cancers, and it is plausible to think that people who are dying from cancer are amongst the worst off. However, not all hyper-expensive treatments are used on those who are amongst the worst off. So it is not clear that accounts of justice which give priority to the worst off would provide blanket support for providing treatment for all those with expensive to treat conditions.[20]

Priority to those who suffer brute bad luck

38 Similarly other accounts of justice argue that there is something particularly problematic about people being left to suffer the ill effects of brute bad luck.[21] (Dworkin, 2000) (Segall, 2010) Particular diseases such as Cystic Fibrosis and other genetic disorders look like quintessential examples of brute back luck and hence on this account these conditions would receive special priority. Given this account of justice, some hyper-expensive treatments would be justified if they addressed these conditions. However this, like the last argument, won't justify all hyper-expensive treatments, but only a limited subset – and one moreover, that will be difficult to delineate.

Patient relative vs Treatment relative costing

39 This paper has proceeded on the assumption that we should look at costs relative to specific treatments. However, this might be seen as an inappropriate way to conceptualise health care distribution. An alternative approach would be to focus on the costs of individual patients rather than treatments. The argument here is again equality based: by focusing on treatments rather than patients it is obscured that in some cases individual patients will require many relatively inexpensive treatments, such that the total cost of their treatment is considerably more than that of a hyper-expensive single treatment. It could be argued that to treat individuals equally, we ought to assess the costs of treating them, rather than the costs of treatments themselves. Indeed it might be argued that the cost effectiveness ratios of individual treatments cannot sensibly be determined since they often depend on and work in unison with other treatments being present.

---

[20] Unless the argument could be made plausibly that having an expensive to treat condition per se makes you amongst the worst off.

[21] That is bad luck that proceeds from chance rather than as a foreseen possibility arising from the agents choices.

Incentives for research and patent expiry

40 There could be great benefits from what are now hyper-expensive treatments becoming available generally in the future. However, if health care systems did not in general provide these hyper-expensive treatments, they might not be researched and brought onto the market in the first place. With regard to rare diseases, Hollis 2006 argues that:

> sufferers of rare diseases will continue to suffer indefinitely without a commitment to funding drugs for those diseases at a rate higher than government funding for common diseases. Paying high prices today for rare disease drugs enables future low prices on the same drugs, following patent expiry (or perhaps after the insurer has paid a reasonable share of innovation costs). Those expensive drugs will become less expensive in the future – but only if they are developed. (Hollis, 2006)

41 Whilst the UK is a sizable market for pharmaceuticals, it currently comprises only 3.5% of the world market for pharmaceuticals. In view of this it seems unlikely that decisions taken by the UK government will, by themselves, make the difference between whether it is economically worthwhile to develop a particular drug or not. This raises a number of questions: does the NHS have an ethical duty to pay very high prices for drugs now in order to support future drug development? Would refusal to do so amount to unfairly taking advantage of those healthcare systems which do buy hyper-expensive drugs?

Doctor-patient relationship

42 A final argument that might be put in favour of supplying hyper-expensive treatments is that if doctors themselves become involved in cost-containment measures, this would undermine the doctor-patient relationship: patients would no longer be able to believe that their doctor is offering them the best treatment available. (Hunter, 2007) Such a fear depends in large part on how rationing is performed: if rationing is performed as at present through cost effectiveness analysis at a national level, and only those treatments which meet the required incremental cost effectiveness are recommended for use in the NHS, then doctors are still able to prescribe the treatment that they think best (of those that are available), and there is no sense that it is the doctor who is acting as a gatekeeper or contrary to the interests of the patient. However, if rationing was performed by doctors (as would be the case under the current proposals around GPs commissioning care), then this would become a much more live issue.

Legal Issues

43 A number of legal issues may arise as challenges which might affect the debate about hyper-expensive treatments or block various policy options. These include: the possibility of challenges to resource allocation decisions under judicial review; potential incompatibility of resource allocation policies with the Human Rights Act, the role of EU orphan drugs regulation, and the limits that international trade agreements such as the Trade Related Aspects of Intellectual Property agreement place on governmental discretion.

Judicial review

44 Judicial review scrutinises the *legality* rather than the merits of decisions. There are a limited number of grounds on which judicial review of a resource allocation can be made: that the authority making the resource allocation decision acted outside of its statutory powers, that it acted irrationally (its decision was so unreasonable that no reasonable authority could have made the same decision[22]), or that it infringed the applicant's rights under the Human Rights Act.

45 There have been a number of cases in the UK in which persons or representatives of persons who have been denied medical treatment for reasons of resource scarcity have sought judicial review of the decision. The courts have rarely found that healthcare resource allocation decisions meet the standard of irrationality. There have been some recent cases where policies that a particular drug will be funded only in exceptional cases have been tested, and in a few cases criteria for exceptionality have been found unreasonable. Burnet J laid down the following as the legal principles that should be followed:

46 The legal principles that are in play are not controversial:

a. When an NHS body makes a decision about whether to fund a treatment in an individual patient's case it is entitled to take into account the financial restraints on its budget as well as the patient's circumstances.

b. Decisions about how to allocate scarce resources between patients are ones with which the Courts will not usually intervene absent irrationality on the part of the decision-maker. There are severe limits on the ability of the Court to intervene.

c. The Court's role is not to express opinions as to the effectiveness of medical treatment or the merits of medical judgment.

d. It is lawful for an NHS body to decide to decline to fund treatment save in exceptional circumstances, provided that it is possible to envisage such circumstances.[23]

Human Rights Act

47 The Human Rights Act 1998 gave further effect in UK law to the European Convention on Human Rights (ECHR). ECHR does not recognise the right to health as a specific right.[24] Articles of the Human Rights Act which might provide support for legal challenge to healthcare resource allocation decisions include Article 2 (right to life), Article 3 (right not to be subjected to inhuman or degrading treatment), Article 8 (right to respect for one's private and family life), and Article 14 (right not to be

---

22 This is the standard that is usually known as Wednesbury unreasonableness, following *Associated Provincial Picture Houses v Wednesbury Corporation* [1948] 1 KB 223.

23 [2008] EWHC 1908 (Admin).

24 For a good overview of which legal systems provide formal protection for health as a human right, see Backman et al (2008).

discriminated against). As in domestic cases, the European Court of Human Rights has been reluctant to intervene in decisions made by public authorities: in *Osman* it found that the right to life "must be interpreted in a way which does not impose an impossible or disproportionate burden on the authorities"[25]

EU regulation

48 At the EU level, the most relevant instruments are the European Regulation on Orphan Medicinal Products Regulation (EC) No 141/2000, which provides extra incentives for the production of drugs for rare diseases. It has recently been argued that these regulations make it too easy for companies to make large profits without doing substantive new work, by redesignating drugs which had previously been in off-licence use for rare diseases as orphan drugs. (Roos et al 2010). The EU Competition Commission looked at pharmaceutical pricing, and produced a major report in 2009: it recommended a review of EU rules on pricing and reimbursement, and also investigated ways in which generic versions of patented drugs could be brought to market more quickly.[26]

Trade Related Aspects of Intellectual Property

49 The UK, through its membership of the World Trade Organisation, is a signatory to the Trade Related Aspects of Intellectual Property (TRIPS) agreement. TRIPS stipulates minimum standards of intellectual property protection worldwide, and sets strict limits on governments' ability to force pharmaceutical companies to supply drugs at affordable prices, by for example compulsorily licensing patents.[27]

50 In summary, the following legal questions are relevant. Are legal challenges to policies which deny access to hyper-expensive treatments likely to succeed? Does the EU Orphan Drugs Regulation require reform? And does TRIPS give governments enough discretion to control pharmaceutical prices?

Potential Policy Implications and Solutions

Politics and public opinion

51 It is clear that the topic of paying for hyper-expensive treatments is one in which there is great public interest. Decisions by NICE concerning Herceptin and Avastin occupied the front page of newspapers for days; and as a result of these and similar

---

[25] *Osman v UK* (Case 87/1997/871/1083) [1999] 1 FLR 193. Even in countries which do have the human right to health incorporated into their constitution (such as South Africa), courts have not interpreted this as a right for each person to have whatever resources are necessary to meet his or her medical needs. In the leading South African case Soobramoney, the court found that Soobramoney's right to health was not violated by a system of resource allocation which denied him access to renal dialysis. It was enough that there was a reasonable and non discriminatory system of prioritisation for dialysis: there was no requirement under the right to health that everyone who required dialysis should be able to receive it. Soobramoney v Minister of Health (Kwazulu-Natal) (CCT32/97) [1997] ZACC 17; 1998 (1) SA 765 (CC); 1997 (12) BCLR 1696 (27 November 1997)

[26] For the materials produced by the commission, see http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/index.html.

[27] This is a severe problem for developing countries, for whom providing even quite averagely expensive drugs raise the same problems that hyperexpensive treatments raise for the NHS.

decisions NICE has been subject to some sustained vilification. (Hawkes, 2008). It is notable that this debate, as it has taken place even in the quality press, has rarely engaged with the opportunity costs of providing hyper-expensive treatments. It would seem that the case for the moral legitimacy of cost effectiveness analysis in health has not yet even been understood, let alone accepted, by the majority of the population. This opens up important questions about the relative roles of expertise (in health economics and/or bioethics) and public opinion in setting public policy for health resource allocation.

52 The current government's £200 million cancer drugs fund illustrates the fault lines of the public debate well. In 2010 David Cameron announced a fund of £200 million to pay for cancer treatments which had been refused by NICE on the grounds of poor cost effectiveness. This was not new money into the NHS, but funded out of cuts elsewhere to the NHS budget. This policy was treated generally favourably in the mainstream media, but was denounced in no uncertain terms in *The Lancet*:

> A very modern triumph of political expediency over rationality…. what this fund represents is not the victory for patient groups that some believe. Rather, it is the product of political opportunism and intellectual incoherence…let us be clear: it not only undermines NICE, it undermines the entire concept of a rational and evidence-based approach to the allocation of finite health-care resources. (Lancet 2010)

53 This suggests that there are both great political opportunities and some potential dangers for a report taking on the issue of hyper-expensive treatments. There are opportunities, in as much as the area would very much benefit from a calm and authoritative voice. But there are also dangers in so far as the issues are so polarised and so contentious that it will be hard to reach a national consensus on the issue.

54 One way to attempt to break the deadlock could be to focus on alternative pricing models for hyper-expensive treatments which would not force a binary 'fund or not fund'-decision. As the next subsection explores, such schemes show promise as they allow the pharmaceutical company some room to in effect negotiate a more affordable price in the UK without having to lower the headline price of the drug.[28]

Alternative Pricing Models

55 Alternative pricing models have been suggested as ways of solving the problem of hyper-expensive treatments, typically by more closely marrying the price paid with the effectiveness of the treatment. There have been three significant suggestions of models of how to do this, largely emerging from industry, seeking the funding of drugs that otherwise would not receive funding according to NICE guidelines.

Pricing on Results

[28] Companies are very reluctant to reduce the headline price for the drug in one country because this then gives health systems in other countries leverage to demand lower prices as well. In the orphan drugs market, companies have preferred to give away fairly large amounts of their orphan drugs to poorer countries than to adopt differential pricing. See Roos, Hyry and Cox (2010).

56 One aspect of the lack of cost effectiveness for some of the hyper-expensive treatments is that they are low yield, i.e. while they are highly beneficial for a small subset of patients with the disease or disorder, for most patients with the condition they have no or minimal beneficial effects. It has been suggested that these drugs should be paid for only when they are effective. This has been trialled with a few drugs in the UK, notably, Velcade, a bone marrow cancer drug. (Lansley, 2008). Pricing on results could be achieved either through individual negotiation between NICE and pharmaceutical companies on a case by case basis, or more radically as a general policy for drug pricing in the UK.

57 However, there are limitations to this approach: while it does associate clinical effectiveness with payment for the treatment it does not necessarily restrain the cost of the treatment. If this model were generally adopted, pharmaceutical companies might, reasonably, increase their costs across the board to cross-subsidise the treatments which fail, just as the present cost of drug development does not only include the cost of developing the successful drug, but also those drugs which were not successfully brought to market. Pricing on results also does not ensure that the delivery of the drug is cost effective, merely that it is therapeutically beneficial: of course, there may have been other more therapeutically beneficial ways of spending the resources allocated to that treatment. Nonetheless, there may be ways that the approach can be modified, for example by linking the size of the payment directly to cost effectiveness that would address some of these concerns.

Copayment

58 Another model which has been proposed in some cases is a copayment model, where for example the NHS pay up to the £30000 threshold and the pharmaceutical company cover any other costs over this limit. This may be done for example via the NHS covering a certain number of treatments with the company providing any further treatments if they are needed, as was the case with Lucentis – a monoclonal antibody fragment used to treat age-related macular degeneration.

59 While this does allow the NHS to contain costs to its threshold it does still allow the introduction of relatively cost-ineffective treatments. Lucentis provides a perfect example of this. In the States controversy about it has developed as the company who developed it, has another drug, Bevacizumab which has been shown to be as effective at treating macular degeneration but at a cost of $42 a dose as opposed to a cost of over $1,593 a dose if Lucentis is opted for.[29] The company has resisted seeking approval for Bevacizumab for use in treating macular degeneration, presumably to protect the profits of Lucentis. (Pollack, 2010; Subramanian et al, 2010) Hence while copayments ought to be explored, there are still challenges here to be met.

Top Up Payments

60 Another option is allowing patients to share the costs of hyper-expensive treatments, by either paying directly or through private health insurance for the additional cost of

[29] Bevacuzumab (Avastin) is much more cost effective for macular degeneration than it is for colorectal cancer, as only a very small dose is required for its effective use in macular degeneration.

treatments beyond the £30000 cut off point established by NICE. While this has been used by some trusts in the UK as a means of funding hyper-expensive cancer drugs in particular, it became controversial in 2008, leading to the government banning it because it was felt to contradict the spirit of the NHS. (Weale et al, 2010). Nonetheless there is a strong prima facie argument for at least exploring this possibility: society allows people to expend private resources to indirectly improve their health outcomes in terms of the food they eat or exercise regimes and it could be asked what makes expending money to directly improve health different.

61 However, experience from the US where top up payments are commonly used by insurance companies to fund expensive treatments might give reason to be cautious. A 2007 meta-analysis concluded:

> Increased cost sharing is associated with lower rates of drug treatment, worse adherence among existing users, and more frequent discontinuation of therapy… For some chronic conditions, higher cost sharing is associated with increased use of medical services, at least for patients with congestive heart failure, lipid disorders, diabetes, and schizophrenia. (Goldman et al, 2007)

Role of NICE and Prioritisation of Health Care in the UK

62 The largest policy issue raised by hyper-expensive treatments is the role that NICE presently plays and how health care in the UK ought to be allocated and prioritised. As noted above, NICE has come under considerable challenge and public vilification for not recommending the funding of hyper-expensive treatments, and furthermore its role and effectiveness may be reduced in the present restructuring of the NHS and the potential devolution of health care allocation to GPs. This might be thought to be particularly pressing since Health Care Professionals have historically not been willing to engage in cost-containment exercises, seeing their professional obligation as being to providing the patient in front of them the best possible standard of care. (Hunter, 2007)

63 Hence, hyper-expensive treatments raise the question of which institutional setting – NICE, physician consortia – is the best way to manage healthcare costs, and also the broader question of the best way to conceptualise and approach healthcare prioritisation in the UK.

Summary

64 It should be clear from this briefing paper that hyper-expensive treatments raise a number of pressing ethical and policy issues that need to be addressed and resolved.

Some of the questions raised by issues set out in this document include:

- What are the obligations of the NHS when it comes to paying for hyper-expensive treatments?
- Is it exploitative for drug companies to seek to maximise their profits by charging whatever prices they think the market will bear?
- Are there any ethical issues which arise for hyper-expensive treatments which are cost-effective?

- Are there any additional ethical issues which arise for hyper-expensive treatments which are cost-ineffective?
- Are there any additional ethical issues which arise for hyper-expensive treatments which are not drug based?
- Why is there such little public acceptance of NICE's judgements regarding hyper-expensive and other treatments, and should this influence decision making in regards to health care provision?
- Is there something special about particular diseases or patients that provides special justification for providing hyper-expensive treatments in these cases?
- Do alternative pricing models resolve issues raised by hyper-expensive treatments, or introduce new issues?
- Does the NHS have an ethical duty to pay very high prices for drugs now in order to support future drug development?

Some broader questions that are touched upon include:

- How should we measure and weigh the health benefits of treatments?
- How should the value of health and healthcare be compared and weighed against other values in regards to public expenditure?
- What role should cost-effectiveness have in considering healthcare funding and distribution?
- What does it mean to treat people as equals when it comes to the allocation of scarce healthcare resources?
- How should healthcare resources be allocated when they cannot be provided for all of those who need them?
- Is NICE is the best way to manage healthcare costs in the UK – if not, then what is the best way to conceptualise and approach healthcare prioritisation in the UK?

References

Adams, C. P. & Brantner, V. V, (2006). "Estimating The Cost Of New Drug Development: Is It Really $802 Million?" *Health Affairs* 25.2: 420–428.

Brickman, P. Coates, D. & Janoff-Bulman, R. (1978). " Lottery winners and accident victims: is happiness relative?" *Journal of Personality and Social Psychology* 36. 8 (Aug. 1978). PMID: 690806, pp. 917–927.

Cystic Fibrosis Foundation (2006). New Statistics Show CF Patients Living Longer. *Cystic Fibrosis Foundation,* available from:

http://www.cff.org/home/index.cfm?ID=6532&blnShowBack=True&idContentType=767

Department of Health (2009). *The Pharmaceutical Price Regulation Scheme 2009*, available from http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_098498.pdf

Department of Health (2010). *A new value-based approach to the pricing of branded medicines - a consultation* http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_122793.pdf

Daniels, N. (1994). "Four unsolved rationing problems. A challenge", *The Hastings Center*

Report 24(4): 27-29.

Daniels, N. (2008), *Just Health: Meeting Health Needs Fairly*, Cambridge: Cambridge University Press.

Dickson, M. and Gagnon, J. P. (2004). “Key factors in the rising cost of new drug discovery and development”, *Nature Reviews Drug Discovery* 3.5: 417–429.

DiMasi, J., Hansen, R. W. and Grabowski, H. G. (2003). “The price of innovation: new estimates of drug development costs” *Journal of Health Economics* 22.2: 151–185.

Dolan, P. (1997). “ Modeling Valuations for EuroQol Health States”, *Medical Care* 35(11): 1095-1108.

Dworkin, R. (2000). *Sovereign Virtue: The Theory and Practice of Equality*. Harvard University Press.

Dworkin, R. (1977). *Taking Rights Seriously.* Cambridge, MA: Harvard University Press.

Gericke, C.A. Riesberg, A. & Busse, R. (2005) “Ethical issues in funding orphan drug research and development” *Journal of Medical Ethics*, 31(3), pp.164-168.

Godlee, F. (2010). “Stop exploiting orphan drugs,” *British Medical Journal*, 341(nov17 2), p.c6587-c6587.

Gold, M., Stevenson, D., & Fryback, D. (2002) “ HALY S AND QALY S AND DALY S, OHMY: Similarities and Differences in Summary Measures of Population Health” *Annual Review of Public Health* 23. 1, p. 115-134

Goldman, D. P. Joyce, G. F. & Zheng, Y. (2007). Prescription drug cost sharing: associations with medication and medical utilization and spending and health. *Journal of the American Medical Association* 298:61-69.

Hawkes, N. (2008). “Why Is the Press so Nasty to NICE?” *British Medical Journal*, 337, a1906-a1906.

Hawkes, N. & Cohen, D. (2010). “What makes an orphan drug?” *British Medical Journal*, 341(nov16 5), p.c6459-c6459.

Hollis, A. (2006). “Drugs for Rare Diseases: Paying for Innovation” in *Health Services Restructuring in Canada: New Evidence and New Directions*. Ed. by Charles M. Beach, Richard P. Chaykowski and S.E.D. Shortt. 1st ed. Queen’s University.

Hughes, J. (2005). “Palliative Care and the QALY Problem,” *Health Care Analysis* 13(4): 289–301.

Hunter, D (2007). “Am I my Brother's Gatekeeper? Professional Ethics & the Prioritisation of Health Care”. *Journal of Medical Ethics*. 33: 522-526.

Jenni, K. & Loewenstein, G. (1997). “Explaining the Identifiable Victim Effect,” *Journal of Risk and Uncertainty* 14.3: 235–257.

Jonsen, A. R. (1986). “Bentham in a Box: Technology Assessment and Health Care Allocation”, *Law, Medicine and Health Care* 14: 172-4.

Lansley, A. (2008). “Nice doesn't have to be nasty” *The Telegraph*, 10 Sep 2008. Available from:

http://www.telegraph.co.uk/news/politics/conservative/2778257/Nice-doesnt-have-to-be-nasty.html

The Lancet, (2010). “New £50 Million Cancer Fund Already Intellectually Bankrupt” *The*

Lancet, 376: 389.

Mann, J. (1997). “Medicine and Public Health, Ethics and Human Rights” *Hastings Center Report* 27 (3), 6-13.

Marmot, M. G. & Smith, D. G. (1991). “Health inequalities among British civil servants: The Whitehall II study” *The Lancet* 337: 1387-93.

Marmot, M. (2005). “Social Determinants of Health Inequalities” *The Lancet*, 365: 1099-1104.

McCabe, C. Claxton, K, & Tsuchiya, A. (2005). “Orphan drugs and the NHS: should we value rarity?” *British Medical Journal*, 331(7523): 1016-1019.

McKie, J. & Richardson, J. (2003). “The Rule of Rescue” *Social Science & Medicine* 56.12: 2407–2419.

Moore, W. (2007) “Keeping mum” *British Medical Journal* 334, no. 7595: 698-a.

NICE, (2010) *Nice Technology Appraisal 212: Bevacizumab in combination with oxaliplatin and either fluorouracil plus folinic acid or capecitabine for the treatment of metastatic colorectal cancer*. Available from: http://guidance.nice.org.uk/TA212

Nuffield Council on Bioethics (2003), *Pharmacogenetics: The ethical issues*. Nuffield Council on Bioethics. http://www.nuffieldbioethics.org/sites/default/files/Pharmacogenetics%20Report.pdf

Pollack, A (2010). "Genentech Offers Secret Rebates for Eye Drug" November 3, The New York Times.

Backman, G. et al. (2008) “Health systems and the right to health: an assessment of 194 countries” *The Lancet*, 372(9655), 2047-2085.

Rawls, J. (1999). *A Theory of Justice* (revised edition). Harvard University Press.

Roos, J. C. P. Hyry, H. I. & Cox, T. M. (2010). “Orphan drug pricing may warrant a competition law investigation” *British Medical Journal*, 341(nov16 1) c6471-c6471.

Schwartz, B. (2005). *The Paradox of Choice: Why More Is Less*. Harper Perennial.

Segall, S. (2010). *Health, Luck, and Justice.* Princeton University Press.

Steinbrook, R. (2008). “Saying No Isn’t NICE — The Travails of Britain’s National Institute for Health and Clinical Excellence” *New England Journal of Medicine*, 359(19), 1977-1981.

Subramanian, et al. (2010). “Bevacizumab vs ranibizumab for age-related macular degeneration: 1-year outcomes of a prospective, double-masked randomised clinical trial,” *Eye* 24 (11): 1708.

Weale, A & Clark, S (2010). “Co-payments in the NHS: an analysis of the normative arguments” *Health Economics, Policy and Law*, 5: 225-246.

Wilson, J., (2009). Not so special after all? Daniels and the social determinants of health. *Journal of Medical Ethics*, 35(1): 3-6.