

Prioritarianism for Global Health Investments: Identifying the Worst Off

DANIEL SHARP & JOSEPH MILLUM

ABSTRACT *The available resources for global health assistance are far outstripped by need. In the face of such scarcity, many people endorse a principle according to which highest priority should be given to the worst off. However, in order for this prioritarian principle to be useful for allocation decisions, policy-makers need to know what it means to be badly off. In this article, we outline a conception of disadvantage suitable for identifying the worst off for the purpose of making health resource allocation decisions. According to our total advantage view: (1) the worst off are those who have the greatest total lifetime disadvantage; (2) advantage foregone due to premature death should be treated in the same way as other ways of being disadvantaged at a time; (3) how badly off someone is depends on the actual outcomes that will befall her without intervention, not her prospects at a time; and (4) all significant forms of disadvantage count for determining who is worst off, not just disadvantage relating to health. We conclude by noting two important implications of the total advantage view: first, that those who die young are among the globally worst off, and second, that the epidemiological shift in the global burden of disease from communicable to non-communicable diseases should not lead to a corresponding shift in global health spending priorities.*

1. Convergence on Priority to the Worst Off

While scarcity of resources for health care and research is pervasive, it is especially pronounced in most low- and middle-income countries, where the available resources are far outstripped by need. This makes priority-setting for health spending in these environments unavoidable. Donors, aid agencies, and national governments must choose between different possible allocations of resources, which would differentially benefit groups suffering from different health conditions. Health economists addressing this issue have often assumed a utilitarian principle: one ought to produce the largest benefit with the resources available.¹ Yet, benefit and cost are not all that matter. Policy-makers ought also to consider how badly off those who benefit are. Benefits to those who are least advantaged — the worst off — should be given greater weight.

The idea of priority to the worst off is widely endorsed. Empirical studies from several countries indicate that many people believe that those who are worse off deserve extra priority when health benefits are distributed.² Most moral philosophers agree, even though they disagree about the justification for the view and the degree of priority that should be given.³ Jonathan Wolff and Avner De-Shalit argue that such convergence around the idea of improving the lot of the worst off yields a common goal for policymakers:

[P]rovided that there are people in a society who have not yet achieved sufficiency, and provided that we have in mind limited, or at least finite, budgets and

financial resources, then all of these views appear to converge on the same general policy prescription in the short to medium term: *identify the worst off and take appropriate steps so that their position can be improved.*⁴

Despite this convergence around priority to the worst off, little systematic work has been done to investigate which ways of being badly off are relevant to health allocation decisions. In order to be useful, an allocation principle which assigns priority to the worst off must specify what constitutes disadvantage in terms that allow policy-makers to identify the worst off. This requires, first, a detailed conception of what it means to be badly off in the sense relevant to the allocation of health resources, and, second, the identification of indicators whose measurement could tell us how badly off a person or population is under that conception.

Developing such a conception is challenging. There are many ways in which people can be disadvantaged. Consider, for example, some of the ways a person's health can be impacted over her lifetime. Some patients experience acute episodes of severe pain or disability, while others endure less debilitating but chronic conditions across their lives. Some die tragically young, while others suffer into old age. Still others face different deprivations, such as poverty, in addition to disease. Policy makers need to know how to compare these different deprivations when making population-level allocation decisions. Moreover, allocation decisions must often be made under uncertainty about exactly who will develop the different health conditions on which money could be spent.

These considerations suggest that in order to develop a conception of disadvantage relevant for health allocation decisions, four conceptual questions must be answered: (1) whether an assessment of the worst off should focus on a person's present predicament or her disadvantage over her lifetime; (2) how to compare premature death to other ways of being disadvantaged; (3) how to incorporate uncertainty about outcomes and beneficiaries; and (4) whether an assessment of the worst off should consider only health or include non-health forms of disadvantage.

In the first section of this article, we outline a plausible prioritarian approach to resource allocation according to which the worst off deserve substantial, though not absolute, priority. In the subsequent sections, we argue for a conception of the worst off according to which: (1) the worst off are those who have the greatest total lifetime disadvantage; (2) advantage foregone due to premature death should be treated in the same way as other ways of being disadvantaged at a time; (3) how badly off someone is depends on the actual outcomes that will befall her without intervention, not her prospects at a time; and (4) all significant forms of disadvantage count for determining who is worst off, not just disadvantage relating to health. Finally, we argue that it is possible to operationalize this conception for policy makers engaged in health allocation decisions. We draw some tentative conclusions about who the globally worst off are and what health conditions afflict them. These conclusions suggest that the recent shift in the global burden of disease from primarily communicable causes to non-communicable causes should not lead to a corresponding global shift in funding priorities.

2. Prioritarianism

There are a variety of ways to ground the claim that the worst off deserve greater priority when allocating health resources. An extreme view — maximin — would hold that we

always ought to benefit the worst off, regardless of the size of the benefit.⁵ This view is implausible, since it justifies ‘creating a “bottomless pit” for those who benefit very little, while sacrificing significant benefits for others somewhat less ill.’⁶ A more plausible (and more moderate) approach is prioritarianism.⁷ Prioritarians hold that the worst off deserve extra consideration when allocating resources because benefiting people has greater moral value the worse off they are. As Derek Parfit puts it: ‘the strength of our reasons to benefit people depends both on the size of these possible benefits and on how well off these people are.’⁸ On this view, how badly off someone is, how much she stands to benefit, and the cost of providing the benefit are all independently relevant to allocation decisions under scarcity.

In this article, our concern lies not with defending a prioritarian view, but rather with how moral theories that endorse the idea of priority to the worst off ought to conceptualise the kind of advantage relevant to a judgment of how badly off someone is. Although we are more sympathetic to certain formulations of the prioritarian principle than to others, we do not think that the particular prioritarian principle one adopts affects the answer to the question of who the worst off are.⁹ Likewise, for those who believe that we should give priority to the worst off, but have non-prioritarian reasons for doing so, our arguments about how to identify the worst off should still hold. The question of precisely how benefits should be distributed to the worst off, or whether other factors beyond disadvantage, cost, and benefit are relevant to allocative decisions, falls outside the purview of the question addressed here.

Though no consensus exists about the exact weight that should be given to benefiting the worst off stratum of society,¹⁰ empirical evidence suggests that most people think it should be substantial. According to studies of how people in Australia, England, Norway, Spain, and the United States assign value to changes in health, most people value equivalent gains in health differently depending on the severity of the initial condition.¹¹ For example, an improvement which took someone from a disability that left them totally bedridden to a very severe impairment (can sit for part of the day) was rated twice as valuable as an intervention which took someone from a very severe impairment to a severe one (can sit, needs help to move about), and 28 times as valuable as an improvement which took someone from a moderate impairment (can move about without difficulty at home, difficulties on stairs and outdoors) to a slight impairment (can move without difficulty anywhere, difficulties with walking more than a kilometre), even though the amount of benefit to each individual was regarded as equivalent.¹²

It is important to keep separate the claim that benefiting the worst off *matters more* from the claim that they are *easier* to benefit or can be benefited *more*. Often, health interventions needed by the most disadvantaged provide greater benefits at lower costs than those needed by people who are comparatively better off. For example, we argue later that children who will die young without intervention should be considered among the worst off. Vaccinating children against common childhood diseases is one of the most cost-effective ways to reduce child mortality.¹³ Preventing a child’s death confers a huge benefit: the opportunity for decades of worthwhile life that would otherwise have been lost. Such a vaccination program therefore merits high priority on three independent grounds: the program benefits the worst off, the benefit that it confers is very great, and the cost of providing the benefit is very low.

The prioritarianism we have articulated is one plausible example of a view that explains the widely held principle that greater priority should be given to the worst off. In the following sections, we outline a substantive conception of disadvantage to which we think such a principle should be applied when allocating resources for health. For the moment, we do not commit to a view about the currency of advantage — whether it should be conceived in terms of access to resources, wellbeing, or capabilities — but speak generically of ‘advantage’ and being ‘well off’ or ‘badly off.’ In Section 7, we return to the currency question.

3. Priority and Time: Does it Matter When Someone is Badly Off?

In *Morality, Mortality*, Frances Kamm distinguishes two temporal considerations that she thinks are relevant to determining who is worst off.¹⁴ In her terminology, *need* gives weight to ‘those who have had the least opportunity for and least of adequate conscious life by the time they die.’¹⁵ *Urgency* concerns itself with people’s immediate future predicaments, that is, how badly off they will soon be if they are not helped.¹⁶

In certain cases, the idea that urgency, in Kamm’s sense, should take precedence is appealing. Consider the following:

Extreme Pain: You must decide which of two people to treat. Both are in pain due to some terrible injury. You only have one analgesic to give, and must decide between them. C suffered from chronic pain for many years and her pain now is considerable. In contrast, D has never suffered such pain before, but his current pain is far worse than C’s.¹⁷

To some, it may seem counterintuitive to treat C over D, even if C’s life will otherwise have gone far worse than D’s overall. Urgency might seem to take precedence over need. Call views that privilege disadvantage at some particular time or times (such as the present) *temporal views*.

Erik Nord argues for a different temporal view according to which only present and future health matter.¹⁸ He suggests that, when assessing who is worst off, we ought not incorporate ‘concerns for past suffering’, since they are ‘sunk costs’.¹⁹ Because we cannot act in the past, past disadvantage does not matter for the purposes of allocating in the present.

Despite some intuitive appeal, these temporal views are mistaken. Three arguments favour the alternative *lifetime view*, according to which the sort of disadvantage that matters is total disadvantage over the course of a person’s life. Rejecting the lifetime view in favour of a temporal view would entail rejecting the very plausible moral principles that underlie these arguments. Moreover, we argue shortly, the intuitions that apparently support a temporal view can be explained in a way that is consistent with both the lifetime view and the underlying motivation for prioritarianism.

The first argument for the lifetime view is based on the primacy of persons as units of moral concern. In matters of justice, we are concerned with the claims of individual persons. One person’s claim cannot substitute for another’s. However, we are not concerned in the same way about the *parts* of an individual person’s life. When two similar people are given different amounts of benefit it may be unfair; but if the same person is given a large benefit one year but not the next, rather than half the benefit in each year, the

question of fairness does not arise. If the proper locus of moral concern is indeed persons, rather than populations or life-stages within a person, then we ought to be concerned with the lives of individuals as a whole. We ought, therefore, to determine who is worst off by looking at who is most disadvantaged over their complete life.²⁰

The second argument runs from temporal neutrality. All else being equal, a given amount of advantage or disadvantage matters equally regardless of when it occurs. For example, a year lived with a health deprivation in 2000 is just as bad for its recipient as a year lived with an equivalent deprivation in 2012 is to an exactly similar recipient at that time. Likewise, a year of happiness in the future will be just as important to its recipient as a year of happiness was to an exactly similar recipient in the past. This suggests that it does not matter how a unit of advantage is related to the present when allocating benefits to others: if benefits matter equivalently over time, it would be misguided to prefer some particular time to another. We should therefore evaluate who is worst off by considering their lives from a temporally neutral viewpoint, rather than giving additional weight to present or future disadvantage.²¹

Finally, a disadvantage at one time can often be compensated for by the provision of advantage at another. We frequently reason this way for ourselves: a sacrifice now is worth it for the gain later. For example, someone may take on additional shifts at an unpleasant job in order to save money for a more comfortable retirement. So too at the level of public policy and distribution: a disadvantage at one time in someone's life can sometimes be compensated by providing an advantage at some later juncture. Yet, if disadvantage is so compensable, it implies that an assessment of someone's claim at a time depends upon considering how well or badly off that person is at other times in her life. Therefore, to assess how badly off someone is we ought to look at whole lives.²²

Together, these arguments suggest that *lifetime* disadvantage is what matters and that, contra Nord, we ought to take past suffering into account.²³ Still, it may seem that the lifetime view does not take into account at all how badly off people are at particular times, and therefore cannot explain the intuition that there is at least some reason to prefer treating D in *Extreme Pain*. However, the lifetime view can and should be specified in a way that accommodates such intuitions.

According to this revised conception of the lifetime view, the value of providing a benefit to someone depends on both the level of disadvantage in her life overall *and* the degree to which she is disadvantaged at the time that she is benefited. The lower someone's overall advantage would be without intervention, the more important it is to increase her overall advantage. Likewise, the lower a person's advantage would be at a time, the more important it is to increase her advantage at that time.²⁴ This conception of the lifetime view is consistent with the underlying motivation for prioritarianism — that benefiting people matters more the worse off they are — and explains Kamm's concern about urgency without unduly privileging the present or future. Just as it is more important to help people the worse off they are over their lives as a whole, so should periods of more acute disadvantage be given greater weight when working out how bad it is to be disadvantaged. In *Extreme Pain*, for example, it is how bad the pain is that explains why relieving it deserves additional consideration, not the fact that it is occurring now. Who should receive the analgesic will depend on how much more disadvantaged C is than D in her life overall and how much worse D's pain is than C's at the time in which they would be benefited.

4. Lifespan: Is a Shorter Life Worse?

Health policy-makers must consider the effects of their allocation decisions on both mortality and morbidity. Some conditions, such as osteoarthritis, cause significant morbidity, but few deaths; for others, such as malaria, most of the associated burden of disease results from deaths. How should these forms of disadvantage be compared?

A strong intuitive case supports the claim that mortality and morbidity are commensurable. Compare two people who live equivalent lives up to age 20. One dies at 20, the other continues living a worthwhile life until 80. Here it seems clear that the person with the shorter life is worse off. The natural explanation of this fact is that the 20 year old misses out on 60 years of valuable life. Thus, it matters how well or badly someone's life goes while she is alive *and* it matters how long she gets to live.²⁵ That both factors matter is also reflected in most people's willingness to trade off one for the other. For example, someone may risk death in order to achieve a valued goal, or, conversely, may deny herself pleasures in order to extend her life. Quality and quantity of life should both be taken into account when assessing disadvantage.

The simplest way to combine quality and quantity of life into a single assessment of a person's advantage is to treat total advantage as a function of a person's level of advantage at each time in her life.²⁶ On this approach, each time period during which someone is alive counts towards the total in proportion to her degree of advantage during that time period. The years a person is not alive (years after her death) have zero value. This is because death confers no advantage, but involves missing out on all the goods of life. This method is assumed in the construction of quality-adjusted life years (QALYs) and disability-adjusted life years (DALYs) insofar as they measure the total amount of (valuable) health or (disvaluable) disease in someone's life. As a result, in many cases, we have most reason to benefit those who live very short lives. In Section 8, we explore this implication in more detail.

This approach accords with intuitive judgments about life and death. In the vast majority of cases, continued life is regarded as better than death and the value of a period of life depends on its quality. However, there plausibly exists some threshold beneath which continued life is no longer preferable to death. Patient decision-making at the end of life suggests that this is so, as some terminally ill patients reach a point at which they judge that continued life is not worth having. Although we take no stance on where such a threshold lies, living in such a state should be treated as negatively valuable.

Various objections might be raised to this simple proposal for how to calculate lifetime advantage. In the philosophical literature on wellbeing, there are arguments that aim to show that wellbeing is not strictly additive,²⁷ that the pattern of wellbeing in a life is important,²⁸ and that there can be posthumous harms.²⁹ However, it strikes us as unlikely that these views, if correct, would make a substantial difference to assessments of advantage at the population level, where their significance is likely to be swamped by the disvalue of extreme poverty, severe illness, and premature death. Incorporating them would, however, impose substantial burdens for people attempting to measure disadvantage, in terms of additional data that would have to be collected and additional computational challenges involved in calculating lifetime advantage. We therefore do not pursue the plausibility of these views further here; were a situation to arise in which incorporating them seemed likely to affect an allocation decision, it would be necessary to revisit their truth. Further, some people are sceptical that death is bad at all.³⁰ This is,

in one sense, true: loss of valuable life, not death *per se*, is bad. However, the sceptical view that loss of life is neutral seems to conflict so thoroughly with our standard moral and prudential outlooks that embracing it would entail a wholesale reevaluation of the enterprise of setting priorities for health care. We therefore do not countenance the possibility further here.

5. Priority under Uncertainty: Prospects or Outcomes?

So far we have discussed cases in which the parties to be benefited are identifiable and their health outcomes are certain. However, in the real world, matters are not so neat. More often, neither the specific people who will benefit, nor their outcomes, are certain. An approach to assessing the worst off needs to attend to both kinds of uncertainty.

Suppose two 40-year-old women with the same quality of life are found to have the same genetic mutation and are therefore judged to have the same elevated chance of developing breast cancer, say, a 50% chance of developing breast cancer within 10 years. Should they be considered equally badly off? In fact, there are two questions here. The first is ontological: are the women equally badly off? Answering this question requires deciding whether someone's current *prospects* or her future *outcomes* determine how badly off she is, that is, whether we should take an *ex ante* or an *ex post* approach to assessing disadvantage. The second question incorporates our uncertainty: if we do not know the ultimate outcome should we *treat* them as though they are equally badly off?

Prioritarians should assess disadvantage according to outcomes not prospects: we should care about whether the women actually will develop cancer, not about their current probability of doing so. As Michael Otsuka and Alex Voorhoeve point out, the alternative view — that we judge how badly off someone is in terms of her *ex ante* prospects — has an implausible implication.³¹ Suppose you are deciding how to distribute a treatment among a group of patients. Each will develop either a severe or a mild condition and has an equal chance of developing either. You know that half will suffer from the severe condition, and half will suffer from the mild. You can either provide everyone a treatment that will improve a recipient's situation if and only if she turns out to suffer the severe condition or provide everyone a treatment that will improve a recipient's situation if and only if she turns out to suffer the mild condition. Both treatments improve the recipient's condition by the same amount (meaning, here, that people who find themselves in this situation would be indifferent between the two treatments). Since the group members all face equivalent prospects, the *ex ante* view implies we ought to be indifferent between the two treatments. This, Otsuka and Voorhoeve note, neglects the legitimate claims of those who, by mere bad luck, become severely impaired. The *ex post* position, in contrast, implies we ought to treat those who will develop the severe condition. Doing so benefits those who will have the strongest claim to treatment, thus according with the intuitive response in the above case. This suggests that people's outcomes absent intervention are what matters for determining who is worse off.

However, decisions must often be made before outcomes are known. In the previous example, the women with the genetic mutation would have to make some choices about preventive interventions before knowing whether they would actually develop breast cancer. Until more is known about their condition, they should be treated equivalently from a policy point of view. The following example may clarify how this would play out.

Most vaccines are delivered in populations where it is known at the outset that only a fraction of the population would, if unvaccinated, contract the illness it protects against. Suppose that we are evaluating the provision of rotavirus vaccines to infants in two equivalently sized populations at high risk for deaths from diarrheal disease. In one population, in the absence of an intervention, 1% of infants will die of diarrhoea caused by rotavirus; in the other 5% will die. Suppose that the proposed vaccination program will essentially eliminate these deaths. Since, on our view, prioritarianism applies to outcomes, *both* those who will die of diarrheal disease without intervention in the population with the 1% mortality rate *and* those who will die in the population with the 5% mortality rate are equally badly off.³² However, the cost of preventing each of the deaths in the lower mortality population is five times higher. Thus, all else being equal, deaths in each population are equally important to prevent, but one vaccination program is more cost-effective than the other.

6. The Plurality of Disadvantage: More than Just Health?

We have so far only discussed ways of being disadvantaged that involve good or ill health and death. But there is more to being disadvantaged than being deprived of health and life. One's life typically goes worse not just when one is unhealthy, but when one is physically insecure, when one experiences economic hardship, when one lacks access to education, and so on. This is because there are important goods — for example, autonomy, close personal relationships, knowledge, and happiness — which make one's life go better independent of their contribution to good health or longevity.³³ The value of these goods is not reducible to health, and people are often deprived of these goods by non-health factors like economic poverty or physical coercion. In short, disadvantage is plural, and is caused by a plurality of factors. This raises a question. When allocating resources for health, should these other forms of disadvantage be taken into account?³⁴ That is, can the fact that one person is worse off than another on a non-health dimension give her greater claim to health resources?

We'll call the view that *only* health should be considered when making health allocations *health exceptionalism*.³⁵ This view is widely, albeit often implicitly, adopted by people working on how to set priorities for health investments. For example, disability-adjusted life years (DALYs) are calculated as a function of two factors: years of healthy life lost and years lived with disability. According to Christopher Murray: 'DALYs are an absolute measure of health loss.'³⁶ Any measure which identifies those worst off by this metric will therefore only account for health related disadvantage. So too with measures which use Quality Adjusted Life Years (QALYs) as their base. Trygve Ottersen suggests that 'the worse off are those that will have the fewer QALYs over their entire lifespan or will have had the fewer QALYs when they die.'³⁷ Since QALYs measure only the health related aspects of wellbeing, basing a metric of disadvantage on them will exclude information about other aspects of disadvantage.

There are two main principled arguments for health exceptionalist views, one based on the distinctive importance of health, and one based on sectoral justice. Neither stands up to scrutiny. The first argument contends that health is different in some relevant way from other forms of disadvantage, perhaps because health is fundamental to the achievement of many valuable opportunities.³⁸ This claim is questionable: health is clearly

important for accessing a variety of opportunities, but this is true of other dimensions of advantage as well, such as economic security.³⁹ In any case, maintaining that health is special in this sense would be too weak to motivate health exceptionalism. The health exceptionalist needs to show not simply that health is valuable, but that it is valuable in such a way that no decrease in health could be offset by an advantage elsewhere. If health losses could be offset by gains in other dimensions, there would be no reason to exclude those other forms of disadvantage when evaluating who is worst off.

The claim that health takes lexical priority over other goods is plainly implausible. People often make reasonable trade-offs between health and other values. For example, I might prefer dying at home with my loved ones to either the extra week of life or the slightly diminished pain of spending my last days in a hospital. The first argument for health exceptionalism denies such everyday facts. It should therefore be rejected.

According to the argument from sectoral justice, different activities or institutions have distinct ends, and ought to aim only to promote those ends.⁴⁰ Thus, the Ministry of Health should only promote health outcomes, the Ministry of Education should only promote educational attainment, and so forth. If ministries of health ought only to focus on health outcomes, then, perhaps, they should only prioritise those worst off with regard to health.

The argument from sectoral justice also fails. First, it is invalid: it would not follow from the fact that the ministry of health should only promote health that the *worst off* are those who are least healthy. It is perfectly coherent to aim to optimise health, while assessing whose health to promote in a more pluralist manner. Second, the claim that health is the sole end of health care is implausible. Patients reasonably can and do care about more than just their health. Indeed, patients and their physicians often make care decisions that do not maximise health. If health is not the only end of health care physicians or patients consider when making health care decisions, there is little reason to think it is the only end that policy-makers deciding how to allocate resources for health can permissibly consider. As Dan Brock puts it:

If health is not all that properly guides physicians' and patients' evaluation and choices of health care, then we cannot simply insist on separate spheres to rule out consideration of non-health effects in other contexts of health care choice and resource prioritization.⁴¹

A further argument for why physicians, patients, and policy makers should not focus solely on health when making decisions about health care concerns the value of health. When policy makers measure health states, they are interested in the *value* of those health states, not some pure measure of health as such.⁴² However, how valuable equivalent health states are depends on other aspects of a person's life. This is because health is not only valuable for its own sake, but because of its impact on other aspects of advantage. John Broome explains:

. . . the way in which a person's well-being is affected by the various elements of her health depends a great deal on other features of her life. For example, asthma is less bad if you are well housed, mental handicap less bad in supportive communities, blindness less bad if you have access to the internet.⁴³

One upshot of Broome's argument is that those badly off in other dimensions of their lives — those who, say, lack access to even basic material resources — will likely be *more disadvantaged* by equivalent health states. This provides a reason to consider what a

person's environment is like when assessing how badly off she is and to consider the other forms of disadvantage a person faces. Health policy makers ought to be concerned not just with the 'amount' of health people have, but also with the valuable contribution their health states make to their lives as a whole. That requires taking into account other aspects of a person's life.

When we identify the worst off for the purposes of prioritising health resources, what matters is how disadvantaged someone is over all the significant dimensions of advantage, not just health. The question, then, is what to make of this conclusion. A defender of health exceptionalism might suggest the answer is: 'not much'. She might agree with our arguments from a theoretical point of view, but deny their practical relevance. In particular, the health exceptionalist might suggest that there are persuasive pragmatic reasons to hold that health policy ought to focus on health outcomes. First, health indicators track more than just health. Often, such indicators are highly correlated with other aspects of advantage (for example, socioeconomic status). This reduces the need for other indicators of advantage. Second, the health exceptionalist might argue that, in contrast to other measures of disadvantage, health outcome indicators tend to be less data-hungry, have more public consensus, and be technically superior. Giving up such measures of disadvantage in favour of a pluralist alternative might be optimal in theory but not in practice.⁴⁴

We are sympathetic to these pragmatic worries. In responding, it is important to separate two questions relevant to determining who the worst off are. Concerning the question of *what* we should attempt to measure when assessing who are the worst off, the pragmatic defender of health exceptionalism agrees that we should measure more than just health. She disagrees about the question of *how* to measure disadvantage. Here, two further questions should be distinguished. First, how should disadvantage be measured given the data available? Regarding this question, it could be true that summary measures of health are the best indicators of disadvantage to which policy-makers currently have access. They should, therefore, certainly not be abandoned, even if they should be augmented by data about other aspects of advantage. Second, we may ask what measures should be developed and what data gathered for them. In response to this question, it is less plausible that health outcome measures are the best measures of total advantage that can be constructed. In Section 7, we suggest some measures that are likely to better capture the multiple dimensions of advantage that matter.

When we identify the worst off for the purposes of prioritising health resources, what matters is how disadvantaged someone is over all the significant dimensions of advantage. This means that sometimes the people whose health deserves greatest priority will *not* be the people who have the worst health. It also means that we need a pluralist measure of advantage in order to identify the worst off. If it can be shown that there are practicable and concrete ways to improve upon standard health outcome measures, and in so doing capture further relevant information about who the worst off are, we should do so. In the next section, we address these issues directly.

7. Operationalising Pluralism: How Should We Measure Disadvantage?

A pluralist conception of disadvantage ideally requires a corresponding pluralist measure. This measure must also be suitable for use at the population level. Although the

ultimate unit of moral concern is the individual, policy decisions must invariably be made on the basis of their effects on groups. A useful measure of disadvantage must therefore be capable of distinguishing groups within a society according to their degree of disadvantage, without being so data hungry as to be impractical. In this section we demonstrate that a relatively accurate, lean pluralist measure of advantage can be developed for purposes of health priority setting. We address two central concerns that might make the development of such a measure seem futile: first, that developing a pluralist measure of disadvantage requires resolving the long-standing debate about the currency of advantage, and second, that any such measure would be too complicated to be implemented. The full development of such a measure is, we acknowledge, a complex conceptual and empirical task that is beyond the scope of this article.

The first challenge for constructing an operational measure is the long-running philosophical disagreement about the currency of advantage.⁴⁵ Resourcists, welfarists and proponents of the capabilities approach all characterise advantage in different ways. According to *resourcists*, one's level of advantage is a function of one's possession of or access to valuable resources. According to *welfarists*, one's advantage corresponds to one's level of wellbeing. And according to proponents of the *capability approach*, advantage should be measured in terms of opportunities to attain important functionings, where these are constituted by valuable states people can be in and actions they can perform. However, despite their differences at the theoretical level, the best versions of each of these approaches tend to converge in their views about most of the things that actually lead people to be better or worse off. In particular, when measuring advantage at the population level, they will employ similar indicators to track the dimensions of advantage.

To illustrate, consider the kinds of population-level social indicators resourcist, welfarist, and capabilities approaches would likely endorse. Plausible resourcist approaches track a diversity of all-purpose means to achieve many significant opportunities.⁴⁶ For example, the 'primary goods' that Rawls thinks people require include the basic rights and liberties necessary for free and equal citizens living a complete life, a background of diverse opportunities, the social basis of self-respect, and all-purpose means.⁴⁷ All-purpose means likely include not just money but things like access to health care and the social institutions necessary to secure valuable opportunities.⁴⁸ Population-level indicators for measuring the attainment of primary goods would likely include the fulfilment of civil and political rights, material goods and economic assets, education, and health.

It might be thought that a resourcist would need very different indicators than would a welfarist. However, this need not be the case. Plausible welfarist approaches take wellbeing to be plural, and think what matters is opportunity to achieve it.⁴⁹ James Griffin, for example, argues that wellbeing is constituted by: agency conditions (autonomy and liberty), understanding, enjoyment, deep personal relations, and accomplishment.⁵⁰ These dimensions are very difficult, perhaps impossible, to measure directly at the population level. For example, how would one directly measure the amount of accomplishment in a population? Therefore, to determine whether one group is worse off than another at the population level, indicators for these abstract dimensions must be developed.⁵¹

Though Griffin's list is concerned with a substantive, normative view of the good life, achieving any of the goods on the list will require, in most cases, all-purpose means like

those Rawls identifies. Accomplishment, autonomy, and enjoyment require basic material necessities like a secure standard of living and health, as well as the fulfilment of certain civil and political rights, while accomplishment and understanding also require access to education.

Compare these views to capability approaches, which measure the opportunities available to attain functionings constitutive of wellbeing.⁵² For example, Wolff and De-Shalit argue that life, bodily health, bodily integrity, belonging, control over one's environment, and mental capacities for 'sense, imagination, and thought' are all important capabilities.⁵³ Again, measuring these capabilities will involve measuring access to all purpose means, basic material necessities, health, the protection of certain rights, education, and so on.

Although resourcist, welfarist, and capabilities approaches disagree about what metric of advantage ought to be preferred, they all develop pluralist conceptions of human flourishing whose approximate measurement can be captured by similar indicators.⁵⁴ Moreover, there is considerable consensus about a core set of indicators that track advantage, however defined. For instance, it is widely agreed that education, minimal levels of material wellbeing, mental and physical health, and the protection of certain civil and political rights are all very important to ensuring the opportunity for a flourishing life. Thus, for practical purposes, those who lack access to education, have a low material standard of living, face severe health problems, and whose rights are not protected, are very likely to belong among the worst off.

Given this convergence, one reasonable way to measure disadvantage would be to replace or supplement health outcome measures, such as QALYs, with the indicators employed by a composite measure of poverty, such as the Human Development Index (HDI) or Multidimensional Poverty Index (MPI), both of which combine indicators of population health, education levels, and standard of living.⁵⁵ Data for the HDI and MPI have been collected from a variety of internationally comparable health and development surveys. For example, the MPI uses ten weighted indicators — nutrition, child mortality, years of schooling, school attendance, cooking fuel, assets, sanitation, water, floor, and electricity — to assess the incidence and severity of poverty in a population.⁵⁶ Moreover, it draws on household level data to supplement national averages, permitting more accurate comparison across groups sub-nationally.⁵⁷ This is important because disadvantage often varies dramatically within countries.

For operationalizing a conception of disadvantage, the MPI is a good starting point. Of course, metrics like this need refinement in order to precisely measure a group's degree of disadvantage. First, as its architects note, the MPI leaves out indicators of many important dimensions, including empowerment, physical safety or security, physiological wellbeing, and civil and political rights.⁵⁸ Second, the data upon which the MPI is based is not currently broken down by gender, age or ethnic group, all of which would provide important information for our purposes. Third, the MPI only captures disadvantage at a time, not disadvantage over time. Since lifetime disadvantage matters, the MPI would need to be adjusted according to life expectancy. Data sources such as the 2010 Global Burden of Disease study can help with this task, as well as providing more detailed information on the nature and causes of ill health in a population.⁵⁹ Finally, further work would be needed to determine the relative weights of different dimensions of advantage. Given the vast and growing literature on the conceptual and empirical challenges to

determining such weights for multidimensional indices, we do not attempt to address that topic here.⁶⁰

8. Implications: What Are the Health Problems of the Global Worst Off?

We've argued for a specific conception of what it means to be disadvantaged. Those who are worst off are those who have the least lifetime advantage, where advantage is understood in terms of a plurality of valuable dimensions. In this section, we draw out some practical implications of our approach for identifying who the globally worst off are and what health conditions they suffer from. We close by considering the significance for priority setting of the recent epidemiological shift in the global burden of disease from communicable to chronic and non-communicable conditions.

A first implication of our view is that people who die very young are almost always among the worst off. Compare someone who dies aged five and someone who dies aged 50. Suppose that the five-year-old was in perfect health until she died and, for the moment, set aside other forms of disadvantage. The 50-year-old has had 10 times as much valuable life as her. In order for their lifetime health to have the same value, he would, on average, have to have spent his life in a state of illness valued at 0.9 (on the DALY scale where perfect health is 0).⁶¹ The GBD study provides disability weights for different health states that are used to calculate the disease burden caused by different conditions. These weights range from 0 (perfect health) to 1 (death). Of the 220 health states for which disability weights are provided, none is rated this close to death. Only 18 have disability weights of 0.5 or greater. The worst afflictions — acute schizophrenia and severe multiple sclerosis — have disability weights of 0.756 and 0.707 respectively.⁶² Hence, in terms of health-related disadvantage, virtually no one who makes it to age 50 will be as badly off over her lifetime as someone who dies at age five. Non-health factors are unlikely to make a difference to this result. First, we would expect the 'poverty weights' assigned to states of non-health deprivation to follow similar patterns to disability weights, i.e. very few states that people are in for extended periods of time will be rated nearly as bad as death. Second, the vast majority of very young deaths occur among people who are already very deprived in other ways — 99% of under-five deaths occur in low- and middle-income countries.⁶³ We will very rarely be comparing groups who die young and rich with groups who die older but much more deprived.

In identifying the health conditions that affect the globally worst off, therefore, we should look first at the health conditions of people who die as infants and children, and people who die as adolescents and young adults living in conditions of extreme deprivation. In other populations, such as in most high-income countries, the burden of disease in young people is fairly low, and further groups will therefore also be included in the class of the worst off. In these contexts, other factors, like non-health related disadvantage, will matter quite a lot, as might factors like how well off people are at the time when they can be benefited. In the context of global health assistance, and in many low-income countries, however, matters are otherwise. The burden of fatal diseases in the young is high enough in these contexts that they will constitute the class of the worst off.⁶⁴

Table 1 provides some illustrative data: it shows the most common global causes of death for under-fives and 5- to 14-year-olds. These are therefore among the health conditions from which the global worst off suffer.⁶⁶ The numbers tell a striking story. In both cases, communicable diseases, including lower respiratory infections, diarrhoeal diseases, malaria, and HIV/AIDS dominate the list. Congenital conditions, injuries, neonatal conditions, and nutritional disorders make up the rest. Though each group has a unique epidemiological profile, in neither case are non-communicable diseases the major contributor to death. This should not be surprising. Non-communicable diseases mostly kill and cause morbidity in people who live past childhood.

Over the last few decades, there has been a major epidemiological transition in low- and middle-income countries from the communicable diseases, neonatal conditions, and nutritional disorders that were previously the primary source of morbidity and premature mortality, to non-communicable, chronic diseases.⁶⁷ Measured in DALYs, communicable conditions are now responsible for less than half of the total disease burden in almost all countries outside of sub-Saharan Africa.⁶⁸ Accordingly, many people now argue, these conditions ought to be higher on the policy agenda, and global health efforts ought to focus more on non-communicable conditions such as ischemic heart disease, chronic obstructive pulmonary disease, lung cancer, and major depressive disorder, by attacking their common causes, such as obesity, smoking, and alcohol consumption.⁶⁹ It is natural to ask whether resources should be redirected from treating and preventing infectious diseases to treating and preventing chronic diseases. The (usually implicit) assumption that policy-makers should aim to minimise DALYs suggests that the answer is yes.⁷⁰ The arguments of this article suggest that those who believe the worst off merit extra priority should usually answer no.⁷¹

Of course, this conclusion does not follow simply from adopting our conception of the worst off. Considerations of cost and the quantity of benefit are also relevant. The costs of preventing or treating many of the most common communicable diseases and

Table 1: *Global Child Mortality (2010)*⁶⁵

Global under-5 mortality		Global 5–14 mortality	
Condition	No. deaths	Condition	No. deaths
Lower respiratory infections	841, 792	Diarrheal diseases	62,476
Preterm birth complications	834, 750	HIV/AIDS	59,696
Malaria	675, 951	Road injury	54,904
Diarrheal diseases	665,129	Malaria	53,599
Neonatal sepsis	509,859	Lower respiratory infections	52,851
Neonatal encephalopathy	501,250	Drowning	39,046
Congenital Anomalies	327,679	Typhoid fevers	41,866
Protein-energy Malnutrition	266,002	Meningitis	29,979
Meningitis	203,469	Congenital anomalies	19,961
HIV/AIDS	126,193	Protein-energy malnutrition	18,317

reducing child mortality are very low.⁷² Oral rehydration therapy, anti-malarial drugs, insecticide-treated bed nets, antibiotics, most vaccines, nutritional supplementation, and now even antiretroviral therapy, are all relatively cheap. The expected quantity of benefit is also likely to be greater than the benefit of treating older adults with non-communicable diseases. This is simply a function of the greater amount of life that can be saved.⁷³ Thus, there are strong reasons to keep communicable diseases and child mortality a high priority when making global health investments.

9. Objections

One might object to the conclusion that we should prioritise the conditions which afflict children who die young on several grounds. Here we consider two possible objections that also raise important considerations for priority setting.

First, it might be argued that in many cases the most effective way to benefit young children is not to provide health care directly to them, but to assist their caregivers. For example, the provision of perinatal care to women is frequently very beneficial to both the women and their foetuses or new-borns.⁷⁴ Likewise, treating HIV-positive parents of small children might be the best way to help the children. The issue of whether and how such indirect benefits should be counted in priority-setting decisions remains contentious.⁷⁵ However, if, as seems plausible, such benefits should be counted in the same way as the direct effects of health interventions then it might be true that sometimes we should prioritise treating people who are not among the worst off. However, the *reason* we should prioritise treating those people in such cases is because doing so is the best way to help the worst off. The indirect benefit objection is thus more a friendly amendment than a real point of disagreement with our conclusion that young children who would die without intervention should be prioritised.

A second objection concerns the badness of death. The current methodologies for calculating QALYs and DALYs assume that the badness of death is a straightforward function of what the decedent misses out on as a result of dying. Thus, for example, all else being equal, it is worse to die aged 20 than aged 80, since one thereby misses 60 more years of valuable life. However, this *comparativist* view of the badness of death has some counter-intuitive implications when applied to deaths at very young ages. It implies that the death of a new-born infant, or even a foetus, is normally substantially worse than the death of a young adult. Many people find this implausible.⁷⁶

These counter-intuitive implications can be avoided by adopting an alternative account of the badness of death. According to *gradualist* accounts, how bad it is to die depends on both the amount of life that the decedent misses out on *and* the child's degree of cognitive development. For late-stage foetuses and new-borns, who are sentient, but lack most of the psychological connections that are necessary in order for their futures to matter to them, the loss of future life is not as bad as it is for an adult who is highly psychologically unified with the future life of which death deprives her. The cognitive features that make future life matter, such as enduring beliefs and desires, future-directed intentions, settled dispositions, and self-consciousness develop gradually during early childhood. However, most of the characteristics that affect how much the loss of future life matters are normally possessed by children by the age of five, and their losses ought not to be discounted.

The gradualist view of the badness of death has important implications for decisions about how to spend money on health, especially in cases concerning relatively expensive treatments for very young infants. If we adopt a gradualist view, then the disvalue of early deaths should be discounted by a factor proportional to the degree to which the relevant psychological features have developed.⁷⁷ A gradualist might therefore object that our approach assigns too much priority to infant mortality.

We endorse the gradualist view, but find the objection — that those who die very young do not belong among the worst off — misguided. The objection conflates the value of a benefit with how disadvantaged the recipient of the benefit is. Gradualism concerns the value of a benefit to an individual. Thus, it implies that saving the life of a new-born benefits her less than saving the life of a five-year-old. However, the value of a benefit is distinct from how badly off someone is. Someone can be very badly off and therefore deserve priority on those grounds, while being difficult to benefit. We therefore see no reason to revise the central conclusion of Section 4: the less life one has, all else being equal, the worse off one is. The new-born who dies is therefore worse off than the five-year-old who dies.

Moreover, even if it is true that we should discount the benefit provided by treating infant mortality, it is implausible that this discounting would lead to a benefit valued so low that the interventions to help these worst-off individuals would be less valuable than those that benefit people who have already had 50 or more years of valuable life. Benefits to older children, adolescents, and young adults should not be discounted at all. Life-saving interventions for these groups provide huge benefits to some of the very worst off. Thus, the objection, while well taken, does not undermine the conclusion that we very often ought to prioritise those who die young.

10. Conclusions: Who Are the Globally Worst Off?

We have argued for a specific conception of what it means to be badly off for the purpose of allocating resources for health. According to the *total advantage* view, the worst off — and therefore those who should get highest priority, all else being equal — are those who enjoy the least lifetime advantage, where advantage is a matter of having the worst outcomes, understood as a function of quality and quantity of life. Disadvantage should be assessed by looking at more than just health: information about other deprivations in significant domains of life, such as (at minimum) access to education and a reasonable living standard should be included.

In practice, the worst off could be identified by utilising data from a measure such as the MPI, which tracks multiple dimensions of disadvantage, and the GBD study which tracks health related disadvantage and mortality for different age groups in a population. Though there are ways in which such a measure could be improved, this conception of and method for measuring disadvantage could be used by policy-makers allocating health resources in a range of contexts.

For purposes of global health investments, the people who are globally worst off according to this conception of disadvantage are for the most part those who die young. They primarily suffer from communicable diseases, such as diarrheal diseases, infections, malaria, and HIV/AIDS, as well as perinatal conditions. The benefit to them of treating or preventing such diseases is usually very large, even when we discount benefits

to infants. Finally, interventions to treat them are often relatively cheap. Together, these conclusions suggest that the shift in the global burden of disease from communicable to non-communicable conditions should not prompt a proportional shift in global health spending.⁷⁸

Joseph Millum, Clinical Center Department of Bioethics, National Institutes of Health, Building 10, Room 1C118, Bethesda, MD 20892, USA. joseph.millum@nih.gov

NOTES

- 1 See J. Cubbon, 'The principle of QALY maximisation as the basis for allocating health care resources', *Journal of Medical Ethics* 17,4 (1991): 181–184 for an example of such a position.
- 2 Koonal K. Shah, 'Severity of illness and priority setting in healthcare: a review of the literature', *Health Policy* 93,2 (2009): 77–84.
- 3 For example, despite their differences, egalitarians concerned with relative equality, prioritarrians concerned with absolute disadvantage, and sufficientarians concerned with ensuring people have enough will all tend to agree that the worst off should be given priority in many circumstances. This is not to say these views do not differ in important respects. For an overview of some of the differences, see Roger Crisp, 'Equality, priority, and compassion', *Ethics* 113 (2003): 745–763.
- 4 J. Wolff & A. De-Shalit, *Disadvantage* (Oxford: Oxford University Press, 2012): pp. 3–4 (authors' italics).
- 5 For an explanation of maximin, see John Rawls, 'Some reasons for the maximin criterion', *The American Economic Review* 64,2 (1974): 141–146. Our qualms about maximin as applied to health care allocation are not intended as a judgment on Rawls's wider deployment of maximin in *A Theory of Justice*.
- 6 Norman Daniels, 'Equity and population health: Toward a broader bioethics agenda', *Hastings Center Report* 36,4 (2006): 22–35.
- 7 Here prioritarianism denotes a specific philosophical position that provides one explanation of the belief that the worst off frequently deserve greater consideration. For further discussion and defence of prioritarianism, see: Derek Parfit, 'Equality and priority', *Ratio* 10 (1997): 202–221; Derek Parfit, 'Another defence of the priority view', *Utilitas* 24,3 (2012): 399–440; Thomas Porter, 'In defence of the priority view', *Utilitas* 24,3 (2012): 349–364.
- 8 Parfit 2012 op. cit., p. 402.
- 9 There are several competing formulations of the prioritarian principle. One view, which we find attractive, is *telic prioritarianism*. Telic prioritarrians, following Parfit, hold that 'We have a stronger reason to act in one of two ways, and this act would in one way make the outcome better, if this act would give people a greater sum of weighted benefits. If other things are equal, we ought to act in this way.' (Parfit 2012 op. cit., p. 402, italics removed). Two features of telic prioritarianism make it attractive for our purposes. First, it takes a claim about the good, that is, a claim about the value of benefits, to be central to prioritarianism; second, nothing in the theory itself rules out certain kinds of aggregation across people. Others are inclined to develop their prioritarian views along broadly contractualist lines. Claim prioritarianism, according to Parfit's formulation, holds that 'people have stronger claims to receive some benefit the worse off these people are' (p. 437). Whichever view one endorses, however, our contention is that what makes a person worse off (or what grounds their claim) is their *total advantage*.
- 10 D.W. Brock. 'Priority to the worst off in health care resource prioritization' in M. Battin, R. Rhodes & A. Silvers (eds) *Medicine and Social Justice* (New York: Oxford University Press, 2002), pp. 155–164.
- 11 Erik Nord, *Cost-Value Analysis in Health Care: Making Sense Out of QALYs* (Cambridge: Cambridge University Press 1999), pp. 32–38. As we argue later, Nord's approach is insufficient because it considers only health-related disadvantage. However, his data provide evidence that many people believe that how badly off someone is should be taken into account when making health allocation decisions. Evidence that people hold such a view about more than just health states can be found in P. Dolan, 'The measurement of individual utility and social welfare', *Journal of Health Economics* 17 (1998): 39–52.
- 12 Nord 1999 op. cit.
- 13 WHO, UNICEF, World Bank. *State of the World's Vaccines and Immunization*, 3rd edn. (Geneva: World Health Organization, 2009).

- 14 F. M. Kamm, *Morality, Mortality: Volume 1: Death and Whom to Save from it* (Oxford: Oxford University Press 1998): 233–267.
- 15 *Ibid.*, p. 237.
- 16 *Ibid.*, p. 250.
- 17 K. Kappel, ‘Equality, priority, and time’, *Utilitas* 9 (1997): 203–226 and D. McKerlie, ‘Priority and time’, *Canadian Journal of Philosophy* 27,3 (1997): 287–309, both discuss a case like this.
- 18 E. Nord, ‘Concerns for the worse off: Fair innings versus severity’, *Social Science and Medicine* 60,2 (2005): 257–263, at p. 259.
- 19 *Ibid.*
- 20 Trygve Ottersen, ‘Lifetime QALY prioritarianism in priority setting’, *Journal of Medical Ethics* 39,3 (2013): 175–180; Thomas Nagel, *Mortal Questions* (Cambridge: Cambridge University Press, 1979), pp. 119–120.
- 21 Note that even if particular people are biased in making self-regarding decisions against the past or towards the future, it does not follow that policy-makers assessing who is worst off should be similarly biased.
- 22 For an extended argument that privileging a particular sub-lifetime is arbitrary, see Mathew Adler, *Well-Being and Fair Distribution: Beyond Cost-Benefit Analysis* (Oxford: Oxford University Press, 2012), chapter 6, pp. 405–476.
- 23 D.W. Brock, ‘Separate spheres and indirect benefits’, *Cost Effectiveness and Resource Allocation*, 1 (2003): p. 4.
- 24 See McKerlie op. cit., pp. 295–6, note 7, for a similar explanation. In brief, the lifetime view can be recast in terms of value. A benefit received when someone is particularly badly off adds more value to her life than a similar-sized benefit received when she is better off, even if the total advantage in her life remains the same. Thus, the total advantage in a person’s life is not equivalent to the value of that advantage. This conception of the lifetime view concerns itself with the total value derived from the welfare in a person’s whole life, rather than simply with the amount of welfare in that life.
- 25 See John Broome, *Weighing Lives* (Oxford: Oxford University Press, 2004), pp. 23–5.
- 26 See John Broome, ‘Measuring the burden of disease by aggregating well-being’ in C.J. Murray et al. (eds), *Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications* (Geneva: World Health Organization), pp. 91–113.
- 27 James Griffin, ‘A note on measuring well-being’ in C.J. Murray et al. (eds.), *Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications* (Geneva: World Health Organization, 2002), pp. 129–134.
- 28 David Velleman, ‘Well-being and time’, *Pacific Philosophical Quarterly* 72 (1991): 48–77.
- 29 Steven Luper, ‘Posthumous harm’, *American Philosophical Quarterly* 41 (2004): 63–72.
- 30 For an overview of this debate see Steven Luper ‘Death’ in E. N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy* (Summer 2009 Edition).
- 31 Michael Otsuka & Alex Voorhoeve, ‘Why it matters that some are worse off than others: An argument against the priority view’, *Philosophy & Public Affairs* 37,2 (2009): 171–199.
- 32 This has a significant implication. Even if one population is overall far worse off than another, there may be unfortunate people in the better off population who nevertheless belong among the worst off. For example, a child who dies shortly after birth in Germany is just as badly off as one who dies shortly after birth in Niger.
- 33 Different writers suggest different lists of such goods. See James Griffin, *Well-Being: Its Meaning, Measurement and Moral Importance* (Oxford: Oxford University Press, 1986) for one canonical list.
- 34 This issue is distinct from the issue of how physicians ought to practice. It applies to high level resource allocation decisions, not necessarily to decisions at the bedside. See Brock 2003 op. cit. on this distinction.
- 35 See D.W. Hausman, ‘What’s wrong with health inequalities?’ *Journal of Political Philosophy*, 15,1 (2007): 46–66, for a similar use of this term.
- 36 C.J.L. Murray et al., ‘Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010’, *The Lancet* 380,9859 (2013): 2197–2223, at p. 2199. The current method for calculating disability weights for DALYs relies on rankings of different health states according to whether someone in one state is judged to be healthier than someone in another (J.A. Salomon et al. ‘Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease Study 2010’, *The Lancet* 380,9859 (2013): 2129–2143). Other ways of calculating how bad it is to be in different states of health may consider how non-health factors affect how bad it is to have a condition. However, even these measures are

- assessing how badly off someone is only with regard to the specific health condition of interest, rather than looking at other, non-health problems that may be experienced by people who also have that condition.
- 37 Ottersen op. cit., p. 175.
- 38 Daniels famously makes this argument about health care: Norman Daniels, *Just Health Care* (Cambridge: Cambridge University Press, 1985). More recently, he makes a similar argument about health: N. Daniels, B. Kennedy & I. Kawachi, 'Justice is good for our health' in N. Daniels (ed.), *Is Inequality Bad for Our Health?* (Boston, MA: Beacon Press, 2000): 4–19.
- 39 For further argument, see: S. Segall, 'Is health care (still) special?', *Journal of Political Philosophy* 15,3 (2007): 342–361 and S. Segall, 'Is health (really) special? Health policy between Rawlsian and luck egalitarian justice', *Journal of Applied Philosophy* 27,4 (2010): 355–358; D.W. Brock, 'Broadening the bioethics agenda', *Kennedy Institute of Ethics Journal* 10,1 (2000): 21–38.
- 40 M. Walzer, *Spheres of Justice: A Defense of Pluralism and Equality* (New York: Basic Books, 1983).
- 41 Brock 2003 op. cit., pp. 4.
- 42 As is widely acknowledged, there is no useful way to 'quantify' a health state aside from in terms of its value. Even if there were a pure measure of health, it would not capture what policy-makers are interested in when making priority-setting decisions.
- 43 Broome 2002 op. cit., pp. 95.
- 44 Our thanks to an anonymous reviewer for the *Journal of Applied Philosophy* for pressing us on this point.
- 45 Amartya Sen, 'Equality of what?' *The Tanner Lectures on Human Values* 1 (1980): 353–369.
- 46 Ronald Dworkin, 'What is equality? Part 2: Equality of resources', *Philosophy & Public Affairs* 10,4 (1981): 283–345.
- 47 John Rawls. *Justice as Fairness: A Restatement*. (Cambridge, MA: Belknap Press, 2000), pp. 57–60.
- 48 Daniels 1985 op. cit.
- 49 R.J. Arneson, 'Equality and Equal Opportunity for Welfare', *Philosophical Studies*, 56, 1 (1989): 77–93. We take for granted that welfarists ought to be concerned with more than bare 'utility'. This moderate pluralism is largely uncontroversial.
- 50 Griffin 1986 op. cit., pp. 64–68.
- 51 Greg Bognar, 'Well-being and health', *Health Care Analysis* 16 (2008): 97–113.
- 52 Sen op. cit.
- 53 Wolff & De-Shalit op. cit., pp. 89–107.
- 54 For a similar argument see J. Wolff, S. Edwards, S. Richmond, S. Orr & G. Rees, 'Evaluating interventions in health: A reconciliatory approach', *Bioethics* 26,9: 455–463. A more casual strategy to show that proponents of competing accounts of advantage are nevertheless likely to agree on many of the basic components of advantage (like wealth, health, and opportunity) is to examine the dialectic found in discussions of wellbeing or advantage. There, a common argumentative strategy is to show that one's opponent's conception of wellbeing or advantage fails to capture something that all parties agree is important to human flourishing (see, e.g., R.J. Arneson, 'Human flourishing versus desire satisfaction', *Social Philosophy and Policy* 16,1 (1999): 113–142). That is, agreement about particular goods that are constitutive of wellbeing or advantage often precedes agreement about what wellbeing or advantage is.
- 55 Khalid Malik et al. 2013, *The Rise of the South: Human Progress in a Diverse World* (New York: United Nations Development Programme); Oxford Poverty and Human Development Initiative (OPHI), Global Multidimensional Poverty Index 2013.
- 56 Note that these are indicators, not dimensions. In this case, child mortality serves as a general measure of population health and access to health care, as it is one of the most reliable measures of health outcomes. Thus, in measuring child mortality, we are not 'double counting' child deaths.
- 57 The data sources for the MPI are the Demographic and Health Survey (DHS), the Multiple Indicators Cluster Survey (MICS), and the World Health Survey (WHS). Other sources of data could be added to this list to further refine its precision.
- 58 Sabina Alkire, 'The missing dimensions of poverty data: An introduction', *Oxford Poverty and Human Development Initiative (OPHI) Working Paper 00* (2007).
- 59 J.A. Salomon et al., 'Healthy life expectancy for 187 countries, 1990–2010: A systematic analysis for the Global Burden Disease Study 2010', *The Lancet* 380,9859 (2013): 2144–2162. It would be useful if the life expectancy measure of the GBD collected sub-national level data too.
- 60 See for example Ingrid Robeyns, 'The capability approach in practice', *Journal of Political Philosophy* 14,3 (2006): 351–376. For a more technical overview, see Keon Decancq & María Ana Lugo, 'Weights in multidimensional indices of wellbeing', *Econometric Reviews* 32,1 (2013): 7–34.

- 61 For purposes of illustration, we abstract away from other features of the DALY approach that would complicate this story without altering the underlying lesson.
- 62 Salomon et al. op. cit. The disability weights used in previous GBD studies were assigned using different methodologies and consequently differ from these (C.J. Murray 1994, 'World Health Organization. Global burden of disease 2004 update: Disability weights for diseases and conditions', available at: http://www.who.int/healthinfo/global_burden_disease/GBD2004_DisabilityWeights.pdf). However, the same conclusion could be drawn: almost no one ever lives for 50 years in a state of health rated so close to death.
- 63 United Nations Inter-agency Group for Child Mortality Estimation, *Levels and Trends in Child Mortality: Report 2013* (New York: United Nations Children's Fund, 2013), p. 10.
- 64 In our view, the category of the worst off is a decision-relative category. The resources available, the scope of the decision in question, and the distribution of the burden of disease are all relevant to identifying the worst off. Thus, the composition of the worst off as a class varies depending on these different factors.
- 65 Global Burden of Disease Study 2010; Global Burden of Disease Study 2010 (GBD 2010) Mortality Results 1970–2010; Institute for Health Metrics and Evaluation (IHME), 2012.
- 66 A more complete analysis would also correlate membership in these groups with membership in the groups that suffer from other health conditions. For example, many children who are at risk for dying from malaria are also at high risk for other debilitating, but less commonly fatal, neglected tropical diseases. Since these diseases affect the worst off, they should also get corresponding priority.
- 67 A. Boutayeb, 'The burden of communicable and non-communicable diseases in developing countries' in V. R. Preedy and R.R. Watson (eds) *Handbook of Disease Burdens and Quality of Life Measures* (New York: Springer, 2010): 531–546.
- 68 Institute for Health Metrics and Evaluation. *The Global Burden of Disease: Generating Evidence, Guiding Policy* (Seattle, WA: IHME, 2013).
- 69 R. Beaglehole et al., 'Priority actions for the non-communicable disease crisis', *The Lancet* 377 (2011): 1438–47.
- 70 For an explicit proposal to this effect, consider an editorial opinion expressed in *The Lancet* concerning the first Global Burden of Disease Study: 'Considering the questions [the GBD study's] results raise, has WHO suggested a change in their current policy of making it a priority to eradicate infectious diseases, and encouraging both nations and charities to fund such endeavours? Far from it. . . . This timid response is unacceptable' (*The Lancet*, 'From what will we die in 2020?' *The Lancet* 349, 9061 (1997): 1263). For a response, see: D.R. Gwatkin, 'Global burden of disease', *The Lancet* 350,9701 (1997): 141.
- 71 It might be suggested that this is a false choice and that policy-makers should aim to address the 'double burden' of communicable and non-communicable diseases. This is to some extent true. But in any situation where there are finite resources for health, directing resources to one disease or disease area reduces what can be done elsewhere. Without far greater funds for health than will be available in the near future, the challenge of deciding which diseases to prioritise cannot be avoided by proposing to address them all.
- 72 E. Bendavid, 'Is health aid reaching the poor? Analysis of household data from aid recipient countries', *PLoS One* 9,1 (2014): e84025.
- 73 There is a difficult question concerning how to evaluate the value of saving someone from a potentially fatal condition when she is likely to then die from something else. The current method for calculating the DALYs associated with disease treats each condition in isolation, so that, for example, saving a child who is a carrier of Huntington's from death prevents just as many DALYs as saving a child who is expected to live to 86. DALYs are calculated in this way so as not to penalise people with co-morbidities and so that the quantity of disease in a population can be accurately calculated. Space does not permit consideration here of whether this is the right approach for a measure that is to be used for priority-setting decisions.
- 74 W.J. Graham et al., 'Maternal and perinatal conditions', in D. T. Jamison et al. (eds) *Disease Control Priorities in Developing Countries*, 2nd edn. (Washington, DC: World Bank/Oxford University Press, 2006).
- 75 Brock 2003 op. cit., p. 4. For an argument that the directness or indirectness of a benefit is irrelevant to priority setting decisions see Jessica du Toit & Joseph Millum, 'Are indirect benefits relevant to health care allocation decisions?' *Journal of Medicine and Philosophy*, Forthcoming.
- 76 Jeff McMahan, *The Ethics of Killing: Problems at the Margins of Life* (New York: Oxford University Press, 2002): pp. 165–185; David DeGrazia, 'The harm of death, time-relative interests, and abortion', *Philosophical Forum* 38,1 (2007): 57–80.
- 77 For extensive consideration of the justification for gradualist accounts of the badness of death and how they should be incorporated into summary measures of health, see Joseph Millum, 'Age and death: A defense of gradualism', *Utilitas*, Forthcoming.

78 For helpful comments we would like to thank Sean Aas, Marion Danis, Christine Grady, Doug Mackay, David Wasserman, Alan Wertheimer, audiences at the Clinical Center Department of Bioethics and the University of Bergen, and two anonymous referees for the journal. **Disclaimer:** The views expressed are the authors' own. They do not represent the position or policy of the National Institutes of Health, US Public Health Service, or the Department of Health and Human Services. **Funding Support:** This work was supported, in part, by intramural funds from the National Institutes of Health Clinical Center and Fogarty International Center.