

# RETHINKING HEALTH: HEALTHY OR HEALTHIER THAN?\*

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## ABSTRACT

Theorists of health have, to this point, focused exclusively on trying to define a state, health, that an organism might be in. I argue that they have overlooked the possibility of a *comparativist* theory of health, which would begin by defining a relation, healthier than, that holds between two organisms or two possible states of the same organism. I show that a comparativist approach to health has a number of attractive features, and has important implications for philosophers of medicine, bioethicists, health economists, and policy makers.

## 1. INTRODUCTION

The concept of health is important in a wide range of contexts.<sup>1</sup> Whether an individual is healthy or not is crucial in determining the responsibilities of a doctor and the proper goals for public health officials. An individual with a health problem plausibly is badly off, objectively speaking, and may have a moral claim on others for assistance. A defendant may properly be excused, legally or morally, for otherwise objectionable behavior, if she is unhealthy.

Given, then, the many situations in which its precise contours matter, it would be reasonable to expect there to be a substantial philosophical literature on the concept of health. To some extent, this expectation has been met: there are countless books and journal articles dedicated to health. This literature, however, focuses almost exclusively on a relatively small number of problems. The relative merits of naturalistic versus normative approaches to health, and the relationship between mental and physical health have been extensively investigated, for example.<sup>2</sup> But this narrow focus has left a number of other fundamental aspects of health unexplored.

In this paper, I'd like to pose one question concerning health that has not, I believe, previously been asked. Most of us think both that an

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<sup>1</sup> See e.g. Engelhardt (2008, xi), Ananth (2008, 1), and the many sources cited therein for a number of examples.

<sup>2</sup> The first question is addressed in virtually every article on the subject. See Murphy (2008) and Ereshefsky (2009) for brief overviews of the debate. For the relation between mental and physical health, see e.g. Szasz (1961), Macklin (1972), and Papineau (1994).

organism can be *healthy*, and also that some organisms or states of organisms can be *healthier than* others. These are different kinds of judgment. The first predicates something of a single entity, whereas the second posits a relation between two entities. Given these two different kinds of health judgment, a question arises as to their relationship. Which kind of judgment is conceptually more basic or underlies the other? In sections two and three of this paper, I'll show that there are two plausible answers to this question, which I'll call *comparativism* and *non-comparativism* about health, but that the existing literature has without argument pursued only the non-comparativist route. Sections four and five will argue that comparativist theories are in several respects more attractive than their non-comparative counterparts. Section six will tie up a loose end, and then in section seven I'll end the paper by showing that quite a lot hinges on this issue: adopting a comparative account of health has important consequences for philosophers of medicine, bioethicists, health economists, and policy makers. Throughout the paper, my sympathies will probably be clear. I suspect that the correct theory of health is a comparative one. But my aim in this paper isn't to argue for that claim. That argument would require a much wider-ranging investigation than I have the space for here. Rather, my aim in this paper is to get the debate started -- to suggest that this is an interesting and important question that deserves a place in the literature.

## 2. COMPARATIVE AND NON-COMPARATIVE CONCEPTS

Let's begin by getting clear on what is, and what isn't, at issue. I'll assume that all sides agree that a theory of health should allow for both comparative and non-comparative judgments. We think, for example, both that a person with a mild cold is *healthier than* someone bed-ridden with pneumonia (comparative), and also that the latter character is *unhealthy* (non-comparative).<sup>3</sup> So the existence of true judgments of each type is not at issue. What is at issue is what kind of relationship there is between the two

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<sup>3</sup> In this paper, I will largely restrict myself to assessments of health along a single dimension: asking whether someone is healthy or healthier than someone else with respect to respiratory function, for example. I believe single-dimension judgments are more basic than what we might call *composite* judgments of health: whether someone is healthy or healthier than others overall. Composite comparative judgments are plausibly radically indeterminate, unlike single-dimension ones. (Can we meaningfully talk about whether a person with a broken leg is healthier than a person with pneumonia? Many theorists who seem to allow for such judgments are in fact making judgments about the relative *value* of the two health states. See Hausman (2006, 2010).) And composite non-comparative judgments are plausibly based on single-dimension non-comparative judgments. If someone is unhealthy *simpliciter*, it is because there are some number of (single-dimension) respects in which that person is unhealthy -- Bob is unhealthy *because* he has decreased respiratory function. (See e.g. Boorse (1997) and Wakefield (1992) for theories that explicitly work this way.) For these reasons, then, I think it is reasonable to look only at single-dimension assessments of health in an exploratory article like his one. I thank Norman Daniels for a very helpful discussion on this point.

kinds of judgment. There are two plausible possibilities, I think. In order to see what they are, it will be helpful to leave health for a moment, to look at other gradable concepts, which, like health, have both comparative and non-comparative forms.

First, take tallness. It's true both that some objects are *tall*, and also that some objects are *taller than* others. What is the relationship between judgments of those two types? The answer here is plausibly that the comparative judgements are more basic or fundamental than the non-comparative ones. When someone says that Wilt Chamberlain is tall, she means that he is taller than most people, or most basketball players. To say that the Empire State Building is tall is to say that it is taller than most buildings, or most buildings in New York. In general, to be tall is just to be taller than a sufficient number of objects in some relevant comparison class.<sup>4</sup> In this sense, the comparative form, *taller than*, is more basic than the non-comparative form, *tall*, since the latter can be defined in terms of the former. If you want to understand the concept of tallness, you should begin by trying to understand *taller than*, not *tall*. I'll call concepts that work like this *fundamentally comparative*. Most gradable adjectives correspond to concepts that are plausibly taken to be fundamentally comparative. Consider, for example: heavy/heavier, rich/richer, and fast/faster.

There are, however, other gradable adjectives that don't work in the same way. A line can be *straight*, and some lines are *straighter than* others. Here, the formula that worked above doesn't seem as plausible. It doesn't seem correct to say that what it is for a line to be straight is for it to be straighter than most members of some comparison class. Instead, we have an independent grasp of what it is to be *perfectly straight* that doesn't depend on a prior understanding of what it is to be *straighter than*. For this reason, it seems more reasonable to begin an analysis of straightness by defining the perfectly straight, and then saying that one line is straighter than another if it experiences less deviation from perfect straightness. Call concepts that work like this *fundamentally non-comparative*.<sup>5</sup> In addition to straightness, ideas like squareness, hollowness, and dryness are plausibly fundamentally non-comparative, and many philosophers seem to assume that the same is true of

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<sup>4</sup> This is the standard view amongst semanticists, who typically analyze the positive form of most gradable adjectives as including a (contextually-defined) reference to some degree of the relevant property. The adjective can properly be predicated of some object when the object has the property to at least that degree. So, Wilt Chamberlain is tall only if he possesses greater height than the reference point -- that is, if he is taller than an object with the reference height. Different semantics for gradable adjectives specify the reference height differently. See Kennedy (2007) for a discussion of several options.

<sup>5</sup> For obvious reasons, we might call these *Platonic* concepts.

fairness and justice.<sup>6</sup>

Now we can return to health. Is health fundamentally comparative, or fundamentally non-comparative?<sup>7</sup> Is health more like tallness, in that *healthier than* is more basic than *healthy*? Or is it more like straightness, with *healthy* more basic than *healthier than*? The answer, I think, isn't obvious, but it is of great importance for a theorist of health.

### 3. TRADITIONAL THEORIES OF HEALTH

If health is fundamentally comparative, a theorist should begin by defining a relation, presumably between organisms or states of organisms. If health is fundamentally non-comparative, on the other hand, she should begin by defining a state that a single organism might instantiate. These are very different starting points, and the difference matters. Trying to define *tall* (without a prior grasp of *taller than*) or *straighter than* (without the idea of *perfect straightness*) would be difficult and unnecessarily confusing. (Try it!)

Given, then, these two different possible starting points for a theory of health, we might expect to be able to divide theories of health into two camps, comparativist and non-comparativist, based on what health concept they take to be more basic. In fact, however, virtually every theory of health in the literature -- and every significant theory -- is straightforwardly non-comparative.<sup>8</sup> Here are a few prominent examples:

- (1) The reference class is a natural class of organisms of uniform functional design; specifically, an age group of a sex of a species.
- (2) A normal function of a part or process within members of the reference class is a statistically typical contribution by it to their individual survival and

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<sup>6</sup> Kennedy (2007), following Unger (1975) and Rusiecki (1985), calls gradable adjectives like these *absolute*, in contrast to the *relative* ones, above. As Kennedy shows, there are a number of semantic features that distinguish absolute from relative gradable adjectives. Health, though, is used in both characteristically absolute and characteristically relative ways, and so an analysis of semantically competent uses of health-terms can't tell us which type of concept health is. This is a result, I think, of our lack of an accepted definition of health. Whereas we know what tallness and straightness are, we don't have an uncontroversial definition of any health term. So it's not surprising that looking at usage isn't helpful here.

<sup>7</sup> There are other logical possibilities. The concepts could be inter-definable, or they could both be dependent on some third health concept. Or perhaps they could be unrelated. I won't consider those options here because none appear in the literature, and because all are even more radical than the proposal I'll be offering.

<sup>8</sup> The only explicitly comparative proposal I've been able to find is in an article which doesn't seem to realize it is offering a very different approach to health (Kovács 1998). Murray *et al.* (2000; *cf.* 2002) propose a framework which would seem to make *healthier than* more basic. But they are, strictly speaking, proposing a constraint on a *measure* of health -- not the basis for a *theory* of health -- and their proposal applies to populations, not individuals. That is, it is a proposal for determining when one population is healthier than another. And, once again, the authors don't seem to be aware that their proposal is unusual. If these are the closest things to comparativism in the literature, I think it is fair to call it virgin theoretical territory.

reproduction

- (3) A disease is a type of internal state which is either an impairment of normal functional ability, i.e. a reduction of one or more functional abilities below typical efficiency, or a limitation on functional ability caused by environmental agents.
- (4) Health is the absence of disease. (Boorse 1997, 7-8)

A is healthy if, and only if, A has the ability, given standard circumstances, to realize his vital goals, i.e. the set of goals which are necessary and jointly sufficient for his minimal happiness. (Nordenfelt 1995, 90)

An individual  $A$  is in a state of health when  $A$  is able to reach or strive for a consistent set of goals actually aimed at by  $A$ . (Richman 2004, 56)

A condition is a disorder if and only if (a) the condition causes some harm or deprivation of benefit to the person as judged by the standards of the person's culture (the value criterion), and (b) the condition results from the inability of some internal mechanism to perform its natural function, wherein a natural function is an effect that is part of the evolutionary explanation of the existence and structure of the mechanism (the explanatory criterion). (Wakefield 1992, 384)

Each of these definitions is clearly non-comparative -- each tells you, of some organism, whether it is in a *state* of health.

Before I can begin to explain why I think this has been a mistake, one more distinction is necessary. In addition to being non-comparative, these definitions share another feature. Each defines health such that a significant number of real life people are, in fact, healthy. Many people have functional abilities above statistically typical efficiency (Boorse), have the ability to realize goals sufficient for minimal happiness (Nordenfelt, Richman), and have internal mechanisms which perform their evolutionarily-defined functions (Wakefield). On these theories health is therefore a reasonable goal for many people. I'll call such theories, according to which a non-trivial number of people alive today are healthy, *realistic*. A theory is *idealistic*, on the other hand, if it defines health such that very few or no people alive today are healthy.<sup>9</sup> There are some idealistic theories of health, but the majority are realistic, like the four above. For that reason, I'll call a theory of health *traditional* if it is both non-comparative and realistic. For the next two sections of this paper, I'll set aside idealistic theories, in order to focus on the choice between a traditional theory of health and a comparative one.

Perhaps because virtually all theories of health have been traditional, all commonly used health metrics are also traditional. The Health Utilities Index (mark 3) (HUI-3), for example, assigns "perfect health" to anyone

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<sup>9</sup> I distinguish realistic from idealistic theories based on whether any actual, contemporary people are healthy -- not based on whether *necessarily*, some people are healthy at any given time, or whether, *necessarily*, health is unachievable. The distinction between *necessarily realistic*, *necessarily idealistic*, and *contingent* theories may be a philosophically more interesting one, but the mundane distinction is all I'll need for my argument.

who scores at the highest level on each of its eight dimensions. Here are two of those dimensions:<sup>10</sup>

| <b>HUI-3 scale for AMBULATION:</b>  | <b>HUI-3 scale for VISION:</b>   |
|---|--|
| <b>1</b> - Able to walk around the neighborhood without difficulty, and without walking equipment.  | <b>1</b> - Able to see well enough to read ordinary newsprint and recognize a friend on the other side of the street, without glasses or contact lenses. |
| <b>2</b> - Able to walk around the neighborhood with difficulty, but does not require walking equipment or the help of another person.  | <b>2</b> - Able to see well enough to read ordinary newsprint and recognize a friend on the other side of the street, but with glasses.                  |
| <b>3</b> - Able to walk around the neighborhood with walking equipment, but without the help of another person.   | <b>3</b> - Able to read ordinary newsprint with or without glasses, but unable to recognize a friend on the other side of the street, even with glasses. |
| <b>4</b> - Able to walk only short distances with walking equipment, and requires a wheelchair to get around the neighborhood.  | <b>4</b> - Able to recognize a friend on the other side of the street with or without glasses, but unable to read newsprint, even with glasses.          |
| <b>5</b> - Unable to walk alone, even with walking equipment. Able to walk short distances with the help of another person, and requires a wheelchair to get around the neighborhood. | <b>5</b> - Unable to read ordinary newsprint and unable to recognize a friend on the other side of the street, even with glasses.                        |
| <b>6</b> - Cannot walk at all.  | <b>6</b> - Unable to see at all.   |

Many people will, obviously, score at the highest level on these two dimensions, and the other six are no different. The HUI-3, then, will count many people as healthy, and so is certainly realistic. And since it describes them as being *perfectly* healthy, the metric seems to be working with a non-comparative conception of health. Other major health metrics work similarly. See, for example, the QWB-SA, SF-36v2, EuroQOL, and DALY measures.

Both existing literature and practice, then, is characterized by a near-exclusive focus on traditional, i.e. non-comparative and realistic, conceptions of health. Nowhere in the literature, however, is there an argument in favor of the traditional approach. In fact, I haven't been able to find a single source which explicitly considers the merits of a comparative approach to health. In the next two sections of this article, I'll begin that task. In section four, I'll offer a general argument for comparativism, and then in section five, I'll suggest that certain influential theories of health are better served by

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<sup>10</sup> Retrieved from <http://www.healthutilities.com/hui3.htm>, 1 September 2010.

taking a comparative approach.

#### 4. AN ARGUMENT FOR COMPARATIVISM: INTER-GENERATIONAL ASSESSMENTS OF HEALTH

So far I've suggested that given the kinds of health judgments we make, there is no obvious reason to favor a non-comparative approach over a comparative one. Nevertheless, theories of health and health metrics have exclusively and without argument been non-comparative. This is already, I think, reason enough to explore the possibility of a comparative theory of health: a reasonable possibility has, apparently for no good reason, been ignored. In this section and the next, though, I'd like to begin to make the stronger claim that there is reason to think that a comparative approach is quite attractive, having a number of advantages over traditional approaches.

First, consider what I'll call *inter-generational assessments of health*. I'll argue that traditional theories have trouble with them, but that comparative theories don't. To see why, consider the following two characters:

*Alys* was a medieval noblewoman. She had access to the most accurate medical knowledge of her time and ate a much healthier diet than most of her contemporaries. She died at age 55 -- a long life, by medieval standards. Had she, however, had access to what we would today consider a barely adequate diet, she would have lived to 60.

*Allie* is a recently-deceased factory worker. She had no regular access to medical care and lived in an area ill-served by public health measures. She ate a diet that, while barely adequate by modern standards, was nutritionally far superior to Alys's. She died at 60, much younger than most of her contemporaries. Had she eaten a diet like Alys's, she would have died at 55.

What can we say about the health of Allie and Alys? Well, there seems to be a clear sense in which Allie was healthier than Alys, since Allie ate a better diet and lived longer as a result. Similarly, Alys was healthier than most of her contemporaries, since she had access to better medical care, ate a better diet, and lived longer. Finally, Allie was less healthy than most of her contemporaries, since she had worse medical care, a poorer diet, and a shorter lifespan than they did.

Now, according to most theories of health (arguably including all four I quoted above), the fact that Alys was healthier than most of her contemporaries means that she was healthy, and the fact that Allie was less

healthy than her contemporaries means that she was unhealthy.<sup>11</sup> If so, we end up with this paradoxical triad:

- (1) Alys was healthy.
- (2) Allie was unhealthy.
- (3) Allie was healthier than Alys.

There are two simple and *prima facie* plausible ways to resolve this tension. First, we could deny one of the three claims. Or, second, we could assert that ‘health’ is not univocal across the three claims. Let’s see whether a traditional theory of health can take either route.

The first option is to deny one of the three claims. The least plausible option, I think, would be to deny that Allie was unhealthy. She had minimal access to medical care, didn’t benefit from public health measures, ate a poor diet, and died young. If she counts as healthy, then the bar for health is being set *very* low, and it will turn out that many people whom we would unhesitatingly call unhealthy will turn out to be healthy.

Also implausible, I think, would be to deny that Allie was healthier than Alys. Allie ate a better diet than Alys and lived longer as a result. It would be very odd to deny that those things make for superior health. The only justification I can see for denying that Allie was healthier than Alys would be a general refusal to accept inter-generational comparisons of health. That is, we might deny that Allie was healthier because we deny that there can ever be meaningful comparisons of health across generations. This is a possible response, but it comes with a price. We do in fact make such comparisons. We make them explicitly when we say that people today are generally healthier than they were a hundred years ago, and we may make them implicitly when we say that medical practice and technology have advanced over time. Many health professionals, researchers, and policy makers have the goal of improving health, oftentimes over generations. Intuitively, these judgments don’t seem especially problematic. Rejecting all intergenerational comparisons of health therefore seems both counterintuitive and *ad hoc*.

If, then, we’re going to try to resolve the paradox by denying one of the three claims, the best bet is to deny that Alys was healthy. This doesn’t seem like an unreasonable thing to say. After all, while Alys was healthier than most of her contemporaries, she ate what we now know was a very

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<sup>11</sup> It might seem that Boorse would not accept that Alys was healthy, since his theory doesn’t make membership in a reference class relative to a time or culture. Allie and Alys, being women 55-60 should both be in the same reference class, and hence if Allie’s functioning is sub-normal, so must be Alys’s. This strikes me as a very bad thing for Boorse to say, since it entails that whether or not my heart is healthy depends on the heart function of people who have yet to be born. (This is, essentially, a more radical version of Guerrero (2010)’s objection.) In any case, what Boorse would say isn’t especially important, since I’ll consider below the option of denying that Alys was healthy and argue that it doesn’t help a traditionalist.

poor diet, which caused her to die much younger than she otherwise would have. Therefore (we might say), Alys wasn't really healthy.

This response is reasonable, I think, but it's not open to defenders of traditional accounts. Recall that traditional accounts are both non-comparative and realistic, and that realistic accounts are those which allow that a significant number of people alive today are healthy. This response says that Alys wasn't really healthy, because she ate a nutritionally poor diet by modern standards and died young as a result. But of course it seems likely that by the standards of some future society, our diet will look nutritionally poor and our lifespans unnecessarily short. For example, certain research suggests that a calorie-restricted diet may have a number of health benefits, including increased lifespan.<sup>12</sup> Similar claims have been made about a diet supplemented with high concentrations of the phytoalexin resveratrol.<sup>13</sup> The point isn't that these particular avenues of research are promising. (The evidence is far from conclusive, to say the least, on both counts.) Rather, the point is that it is very likely that some research like this will eventually pay off. It would be surprising if we didn't make *some* major advances along these lines at *some* point in the future. A future society with access to those advances will look back on us, today -- just as we can look back on Alys -- and say that we aren't healthy because (by their futuristic standards) we eat a nutritionally poor diet and die young as a result. So, if we deny that Alys was healthy because her diet led to an unnecessarily short life, then we are also committed to saying that none of us are healthy, either, since there is surely some possible change in our diet that would increase our lifespan. This, though, is something a traditional account can't say, since traditional accounts are realistic: they say that a significant number of people alive today are healthy.

If all of this has been correct, the traditionalist can't plausibly respond to the tension in saying that Alys was healthy, Allie was unhealthy, and Allie was healthier than Alys by denying one of the three claims. Denying the first isn't open to the traditionalist, denying the second would set the bar for health incredibly low, and denying the third seems *ad hoc* and leads to counterintuitive results. That means that the traditionalist will need to instead take the second escape route we noted earlier, and assert that 'health' isn't being used in the same way in all three claims.

In fact, I think this is the most obvious response to the original problem. If we say that Alys was healthy because she outlived her contemporaries, what we really mean is that she was healthy *for a medieval noblewoman*. Similarly, Allie wasn't unhealthy *simpliciter*; rather, she was unhealthy *by today's standards*. We might therefore interpret the first two elements of the triad like this:

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<sup>12</sup> See Everitt *et al.* (2010) for a summary of some research.

<sup>13</sup> See e.g. Baur and Pearson *et al.* (2006).

- (1') Alys was healthy<sub>THEN</sub>.
- (2') Allie was unhealthy<sub>NOW</sub>.

So far, so good. The problem comes in figuring out how to interpret the third claim, that Allie was healthier than Alys. In particular, does 'healthier' get a subscript? Intuitively, it seems to me that it should not. While it is plausible to think that standards of health vary across generations, it seems less plausible to think that what makes someone healthier does -- at least when it comes to things like length of lifespan.<sup>14</sup>

So, the better route is to deny that 'healthier' has a subscript. There may be a way for a non-comparative theory to do this, but it is a much more natural thing for a comparativist to say. Recall that a non-comparativist says that *healthy* is more basic than *healthier than*. So, the non-comparativist will need to construct a non-subscripted concept of comparative health, from a collection of subscripted health concepts. That is, the non-comparativist will need to take a collection of *healthy<sub>X</sub>s*, and turn them into a single *healthier than* relation. This will end up being a somewhat messy definition, may not result in a complete ordering, and will have counterintuitive consequences.<sup>15</sup>

A comparativist, however, defines *healthier than* first, and so doesn't face any of these problems. Since *healthier than* is more basic, it has no subscript, and then the various subscripted health concepts are defined in a very natural way. Someone is healthy by contemporary standards, or healthy<sub>NOW</sub>, if she is healthier than a sufficient number of people living today. This should be familiar, since it is precisely the way other fundamentally comparative adjectives are typically analyzed. Except as part of a bad joke, there is nothing even *prima facie* paradoxical about this triad:

- (1\*) Usain Bolt is fast.
- (2\*) Amtrak trains are slow.
- (3\*) Amtrak trains are faster than Usain Bolt.

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<sup>14</sup> Even if we were to allow for a collection of subscripted 'healthier's, that wouldn't appreciably help traditional accounts. Presumably Alys ought to be able to recognize some sense of healthier, such that Allie was healthier than she was. (Fully aware of the consequences, she would surely swap Allie's diet for hers!) Similarly, we ought to be able to recognize that future people -- on a calorie-restricted diet, say -- are healthier than we are. This seems to be in tension with a traditional account. Other non-comparative gradable adjectives, like *straight*, *hollow*, and *pure*, are naturally associated with terms like 'complete' and 'perfect'. That is, our basic idea of straightness is of *perfect* straightness. So this proposal would have us say that although some people today are *perfectly* or *completely* healthy, we could all be healthier (in some sense that we can recognize).

<sup>15</sup> The most obvious proposal would say that X is healthier than Y iff there exists some (subscripted) concept of health according to which X is healthy and Y isn't, and no concept of health according to which Y is healthy and X isn't. Combined with a realistic account, this will produce oddities: both I and the future calorie-restricted dieter will be perfectly healthy<sub>NOW</sub>, but she will be healthier, *simpliciter*, than me.

Usain Bolt is fast *for a human being*, or fast<sub>HUMAN</sub>, since he is faster than the vast majority of humans, while Amtrak trains are slow *for passenger trains*, or slow<sub>TRAIN</sub>, since they are slower than most passenger trains. Nevertheless, Amtrak trains are faster, *simpliciter*, than Usain Bolt. This is precisely how the comparativist handles the original triad.

The comparativist, then, can offer a very natural and familiar account, which accommodates inter-generational assessments of health. The traditionalist, on the other hand, is either unable to account for inter-generational judgments, or else must offer an account that is in certain respects *ad hoc* or unnecessarily complicated. I conclude that in the case of inter-generational assessments of health, a comparative approach is preferable to a non-comparative one.

## 5. ANOTHER REASON TO BE A COMPARATIVIST: FUNCTIONALIST THEORIES OF HEALTH

In the last section, I suggested that inter-generational assessments of health are better handled by comparativist approaches to health than by traditional ones. That argument was intended to be as theory-neutral as possible, applying to just about any account of health. In this section, I'll offer considerations that don't reach quite so broadly, but are nevertheless applicable to most traditional theories of health.

A large majority of the theories of health on offer could be described as broadly *functionalist* in the following respect: they declare an organism healthy based on whether the organism (or some part of the organism) can *do* something. As we saw above, for example, Boorse declares an organism healthy (roughly) if its parts function with at least statistically typical efficiency. Wakefield asks whether the organism's internal parts can perform their evolutionarily-defined functions. Nordenfelt asks whether the organism can achieve its vital goals. Richman asks whether the organism can reach or strive for a consistent set of its goals. Health metrics, like the HUI-3 we saw above, are also straightforwardly functionalist.

I believe that all, or at least most, functionalist approaches to health are in fact better suited to a comparative analysis. In other words, most traditional, functionalist theories of health have a comparative counterpart that is, in important respects, more plausible. In the remainder of this section, I'll show that this is true in the case of Boorse's theory. (With only minor modifications, the argument could be applied to many other functionalist approaches, though I don't have the space here to discuss

them.)<sup>16</sup>

Boorse's first gloss on health is that it is statistically non-subnormal functioning. But, as Boorse recognizes, things can't be quite that simple. This leads him to introduce several complications into his theory. First, there are some things that seem clearly to be diseases or health problems that have very high prevalence in a population. If the prevalence is high enough, the diseased state can be statistically normal and therefore wouldn't count as a health problem if health were defined relative to statistical normality. Dental caries are statistically normal, yet seem to be a health problem. Even if pollution affects an entire population, the lung problems which result are still a health problem. If health were defined relative to statistical norms, then one way to make a sick person healthy would be to give everyone else in the population the same problem. The possibility of this kind of "leveling down" is theoretically perverse.<sup>17</sup>

In order to avoid this objection Boorse tinkers with his definition, adding that something counts as a disease if it is a "limitation on functional ability caused by environmental agents," even if it is statistically normal. There are, however, reasons to doubt that Boorse's amendment is successful.<sup>18</sup> I don't have the space here to evaluate these objections or Boorse's replies, so I'll instead simply note that, at best, the possibility of universal diseases introduces an epicycle into Boorse's theory; at worst, it constitutes a decisive objection.

The central place for statistical normality within Boorse's theory also causes a second problem. Boorse doesn't think that someone in the 49th percentile with respect to visual acuity counts as unhealthy, even though that person does have statistically below-average vision. Rather, Boorse thinks that someone counts as unhealthy only if she is functioning at below "typical efficiency", where the line between typical and atypical efficiency is

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<sup>16</sup> The basic idea is: with most functions, there is the possibility of performing them to a greater or lesser extent. If health is defined relative to goal-achievement, for example, in most cases an agent can achieve more or fewer goals, and can sometimes achieve individual goals to a greater or lesser extent. A non-comparativist will generally need to specify the minimum level of goal-achievement consistent with health. A comparativist need not do so, instead saying that a greater level of achievement implies greater health.

<sup>17</sup> Guerrero (2010) objects to Boorse's theory on this ground, finding it implausible that a mere "Cambridge change" could affect an individual's health. This objection doesn't apply to the comparative version of Boorse's theory I offer below, since the comparativist makes *healthier than* more basic than *healthy*. I believe Guerrero would agree. (See his note 17.)

<sup>18</sup> See e.g. Richman (2004, 23-24), Hare (1986), and Boorse (1997, e.g. at 67). There are also the general problems that there is not always a clean line distinguishing the organism from the environment (see e.g. Lewontin 2001), and that we seem to recognize the possibility of universal *internally*-caused diseases (e.g. genetic ones). Finally, certain kinds of limitations imposed by the environment don't intuitively seem like health problems. (I'm not diseased, even if a higher oxygen concentration in the air or manna-raining-from-heaven would improve my athletic performance.) These objections are related to a (much more serious) objection of Kingma's (2010, esp. §3). I should note that the proposal here does not address the heart of Kingma's worry, and so a Boorsean would need to make further revisions to deal with her objection. I set aside such concerns here.

“arbitrarily chosen” (1997, 8). Now, Boorse suggests that this isn’t likely to be a serious problem, since in most cases it will be obvious on which side of the line a given person’s function falls (1977, 559). While this may be true in some cases -- it’s usually clear enough whether or not someone has a broken leg -- it’s certainly not true in all cases. There are plenty of conditions that don’t fit this model. Sight, hearing, IQ, respiratory function, and a host of other attributes exist on a spectrum. If we define health relative to functional ability, there will be patients whose function falls very close to whatever line we draw. So on Boorse’s theory there will be borderline cases of health (Boorse 1997, 19).

Now, this by itself isn’t an objection. Many concepts have vague or arbitrary boundaries, as philosophers have long recognized. Boorse regards health as fundamentally non-comparative, though. As we saw above, with fundamentally non-comparative concepts, the comparative form is defined in terms of the non-comparative form. So, since Boorse begins by defining *healthy*, he’ll later need to define the relation *healthier than* in terms of it. That means that *healthier than* will be defined in terms of a vague and/or arbitrary concept of health. It therefore seems likely that that vagueness or arbitrariness will “infect” the *healthier than* relation.

Compare that to what happens if we instead try to formulate a comparative version of Boorse’s theory. Suppose we take Boorse’s central insight to be that health is about functional ability, where functions are defined relative to the goals of survival and reproduction. It’s easy to use that to formulate a simple, comparative theory of health:

X is *healthier than* Y in respect R, iff X’s R-functioning is superior to Y’s R-functioning (given the goals of survival and reproduction).<sup>19</sup>

From this, we could then define *healthy* just as you would expect for a fundamentally comparative concept:

X is *healthy* in respect R iff X’s R-functioning is superior to the R-functioning of a sufficient number of the members of some relevant comparison class.

This definition of health still has the arbitrariness of Boorse’s, since being healthy depends on functioning superior to a “sufficient number” of others in an as-yet-unspecified comparison class. (In fact, depending on how these

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<sup>19</sup> There is a difficulty here, of course, about what ‘superior’ means. How are we to figure the impact of a particular trait on an organism’s survival and reproduction? (What background conditions should be assumed? What if a trait increases survival in some common environments, but decreases them in others? What if a pair of traits increase survival when together, but decrease it when alone? What if a trait increases the likelihood of survival, at the cost of reproduction?) These problems are serious, but they are ones that Boorse must answer in any case. Objections of this sort apply equally to comparative and non-comparative Boorsean theories, and therefore can’t adjudicate between them.

are defined, it could deliver *exactly* the same health judgments as Boorse's theory.) But instead of defining *healthier than* relative to this vague standard, on a comparativist theory *healthier than* gets defined first, and precisely. So, the comparativist is guaranteed of having at least one precisely-defined health concept.

And the precisely-defined concept seems like the more important one. When faced with a borderline case of health -- say, someone with 20/40 vision -- a Boorsean seems to be stuck. The best he can do is try to decide where an arbitrary line is to be drawn. A comparativist, on the other hand, can step back and say that whether or not the patient is *healthy*, she is without doubt less healthy than people with 20/30 vision, and more healthy than people with 20/50 vision. In much the same way, two people arguing over whether LeBron James is a tall basketball player could agree that he was taller than exactly 60% of basketball players. Does that make him tall? That's debatable, but the question doesn't seem especially important. The more basic question is the comparative one, and that has been answered precisely. Whether or not we agree on whether James is *tall*, we can all agree, for any given player, whether James is *taller than* that player. Further argument about whether or not he is *tall* would seem beside the point. For a comparativist, about health or tallness, the more basic form also seems more important, and it gets defined precisely.

For these reasons, I think that the comparativist version of the Boorsean approach can better deal with the arbitrariness that Boorse thinks attaches to the concept of health. Note, also, that the comparativist has avoided the problem of universal diseases. If we all have tooth decay, then all of us are less healthy than our decay-free counterparts. If pollution reduces respiratory function across an entire population, then the whole population becomes less healthy. Universal diseases pose no trouble for the comparativist.

I conclude, then, that a Boorsean -- or, more generally, a functionalist about health -- should consider adopting a comparative analysis. The considerations presented here aren't dispositive, of course. It's possible that some non-comparative Boorsean theory could adequately deal with the problems of universal disease and arbitrariness. But even if that is possible, the comparative version we've seen here is, I think, much simpler and therefore *prima facie* preferable.

## 6. A NON-COMPARATIVE ALTERNATIVE?

Before moving on to see why all of this matters, we need to tie up one loose end. Back in section three, I defined traditional theories of health as those that are both non-comparative and realistic. In the last two sections, I argued that comparative theories have certain advantages over traditional theories. That ignores, however, the obvious third possibility: a non-

comparative, *idealistic* theory. Recall that an idealistic theory is one that defines health in such a way that few or no people living today count as healthy. Such a theory wouldn't be tripped up by the Alys/Allie example. A non-comparative idealist about health would say that neither Allie nor Alys was completely healthy, although Allie was healthier than Alys. It would also be in a good position to avoid the problems of vagueness, arbitrariness, and universal diseases, which in the last section we saw affected functionalist theories. In this section, then, I'll briefly consider whether non-comparativism might be saved by a move to idealism about health.

Unlike comparativism, idealism about health isn't an unknown position. The preamble to the World Health Organization Constitution famously defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (1948).<sup>20</sup> And the "positive health" movement, especially among mental health professionals, similarly thinks of health as something that extends far beyond the state that most of us occupy.<sup>21</sup>

Is idealism, then, an adequate response to the worries I've raised here? It may be, but I think there is still reason to prefer a comparative account. Suppose idealism about health were true. Even if that were the case, in practice we would still have to be comparativists, at least about many aspects of health. We simply don't know what the maximum human lifespan would be (or even if there is such a thing). We don't know what the optimal immune system would look like. We don't know what level of vision human beings are capable of. If an idealist defines health as including maximum lifespan, optimal immune system, and perfect vision, we have no way of knowing what that is.

We can, however, easily determine differences in lifespan and vision. And we can say, of some immune systems, that they're better than others. If we were to proceed in that way -- as we surely would -- we would, essentially, be adopting a practice that is comparativist. We would be directly making judgments about what states are healthier than others, without knowing what would count as the ideal, perfectly healthy state. So, even if idealism were true and we knew it, our practice would nevertheless *look* comparativist. Given a choice between a non-comparative, idealistic theory and a comparative one, then, it seems reasonable to favor the comparative one. Absent some compelling reason for adopting an idealistic approach, if our practice is going to be comparativist, we should let our theory be comparativist, too.

This is, of course, a rather weak result -- one that could easily be

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<sup>20</sup> As Bok (2008) notes, the drafters of the WHO's constitution were influenced by Henry Sigerist's positive account of health, as "immeasurably more than just the absence of disease" (1941, 53). But the obviously idealistic element of the definition, that health is a state of *complete* well-being, is not found in Sigerist, and was in fact a very late addition, appearing only in the final few drafts.

<sup>21</sup> See e.g. Ryff and Singer (1998, 2000)

outweighed, were idealistic theories shown to have other advantages. In the end, though, I'm not sure how important it is to reject idealism. In the final section of this paper, I'll explain why the debate about comparativism matters -- why adopting a comparativist approach should affect debates in the philosophy of medicine and bioethics, and why it should affect the practice of health measurement. Most of these consequences would still follow if we were to move from a traditional to an idealistic theory, instead of to a comparativist one. So, a move to idealism is, like a move to comparativism, a big step away from the *status quo*.

## 7. WHY THIS MATTERS: THE CONSEQUENCES OF COMPARATIVISM

I haven't done enough in this paper to make the case that comparativism is *true*. I haven't, for example, explored the disadvantages and counterintuitive results which might come from adopting a comparativist theory, and which would need to be balanced against comparativism's virtues.<sup>22</sup> Nevertheless, I hope I've said enough to convince you that comparativism is at least plausible enough to be worthy of consideration and exploration. You might still wonder, though, how important the issue really is -- the difference might seem merely academic, in the pejorative sense of that term. It might also seem like I've been arguing against a straw man. Even though theories of health have, formally, been non-comparative, couldn't we simply and charitably interpret theorists of health as implicitly holding comparative theories, but publishing them in non-comparative form because the *health* of individuals is what doctors, WHO delegates, and others want to know about?<sup>23</sup> (The WHO charter would have much less rhetorical force were it rewritten comparatively!) I'd therefore like to conclude by showing, in increasing order of importance, three ways in which moving from a traditional to a comparative account would have significant consequences.

First, and most obviously, if a comparative account is correct, we

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<sup>22</sup> The most obvious cost of a move to comparativism is that it seems to place what we might call talents, fitness, and "positive health" on the same scale as disease and disability, when intuitively these are different things. We seem to be making qualitatively different kinds of claims when we say that a person is disabled because she can't walk a quarter-mile without difficulty, and when we say that someone is especially fit or talented because he can climb a mountain. There are several ways a comparativist might try to blunt the force of concerns like these, but I think that at least some counterintuitive consequences will remain. (See my *(unpublished)* for a discussion of related issues.) I suspect that on balance this will prove a worthwhile price to pay, but this is an issue that needs to be investigated further, once we have concrete comparativist theories of health on the table.

<sup>23</sup> Although, such charity can be difficult to muster. Boorse, for example, is quite explicit in his non-comparativism: "We have supposed that the basic notion is 'X is a healthy Y'... As long as the efficiency of all functions exceeds a minimum, any value of these traits is as healthy as any other. In this way, our definition...[recognizes] a wide range of individual differences of equal intrinsic health" (1977, 562-3).

should be having different debates in the philosophy of medicine. I showed earlier that universal diseases are no longer a problem for Boorse, once he moves to a comparative account. The problem of arbitrariness also isn't as important. Similar things hold for other functionalist theories of health. For example, a theory like Nordenfelt's no longer needs to worry about defining 'vital goals' or 'minimal happiness' in the same way. These are all topics on which philosophers of medicine have written extensively. If comparativism is correct, these discussions can end, or at least carry much less weight. Moving to a comparativist account, therefore, should change what philosophers of medicine write about, since a number of philosophical puzzles arise only on the assumption that a non-comparativist theory is correct.

Second, if comparativism is right, we should think about a number of issues in bioethics differently. Whether or not someone is healthy seems to carry important ethical implications. For example, whether a medical intervention counts as a treatment or an enhancement is, at least in many circumstances, dependent on the health of the patient. Laser eye surgery on a patient with 20/200 vision is a treatment, whereas laser eye surgery on a patient with 20/16 vision would usually be thought of as an enhancement. Now, on a comparativist account, to be healthy is to be healthier than a sufficient number of people in some comparison class. That means that whether or not you have healthy eyesight depends on how healthy other people's eyes are. So, on a comparativist account, health ends up being an extrinsic property. But if health is an extrinsic property and health marks the difference between treatments and enhancements, then there won't be any intrinsic quality distinguishing treatments from enhancements. Many moral objections to enhancement, however, rely on identifying such an intrinsic quality.<sup>24</sup> If comparativism is correct, these lines of argument aren't promising.

That doesn't mean, however, that there is nothing wrong with enhancement. An extrinsic quality is still a real quality, so it remains possible that a good, non-instrumental objection to enhancement could be found. Fairness is on most accounts an extrinsic property (since whether your share is fair depends on what others receive). Kantian universalizability arguments appeal to extrinsic factors (since we must imagine that others act on the maxim under consideration). And sufficientarian accounts of justice may also include an extrinsic element, depending on how the line for sufficiency is determined. So, philosophers concerned about the moral status of enhancement should focus on arguments based in fairness, Kantian universalizability, sufficiency, and the like, rather than on those which assume that there is an intrinsic difference between treatment and enhancement.

Finally, and of greatest practical importance, if comparativism is true, the practice of health measurement should change in ways that have the

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<sup>24</sup> See e.g. Sandel (2004, 2007) and Kass (2003).

potential to dramatically affect the distribution of health resources. As we saw above, health metrics are traditional. The HUI-3, for example, purports to be measuring levels of *health*, but it measures eyesight only up to the ability to “read ordinary newsprint and recognize a friend on the other side of the street, without glasses.” It measures ambulation only up to the ability to “walk around the neighborhood without difficulty.” The HUI-3, then, measures only the very bottom of the possible range of visual and ambulatory function. Most people will score at the highest level for vision, and most will also score at the highest level for ambulation. Now, on a non-comparativist view, this might be defensible. For Boorse, something counts as a health deficit only if it involves functioning at below typical efficiency, which is an arbitrary range around the statistical mean. The HUI-3, then, might actually measure the full range of (un)health. Someone who had 20/30 vision would get perfect marks on the HUI-3, but would also count as healthy for Boorse, since she would lie within the “typical” range.

To a comparativist, however, metrics like the HUI-3 are missing a huge part of the range of health. On a comparativist view, there are real health differences between people with 20/30, 20/20, and 20/16 vision. There are real health differences between the person who can walk around the neighborhood without difficulty, and the person who can also run a mile without fatigue. These health differences, though, will be missed by traditional metrics, because those metrics capture only the bottom portion of the range of health. Traditional health metrics therefore can’t be used to justify claims about the overall level of health in some population. To do so would be like making claims about the average winter temperature in Boston, when one had a thermometer that only went down to 0°C.

So, metrics like the HUI-3 need to change in one of two ways, if comparativism is true. The first and simplest option would be to change the metrics, so that they do capture the full range of health. The HUI-3 questionnaire could be revised to ask, not just whether someone can walk around the neighborhood without difficulty, but whether that person can run a mile -- or five. This would require a drastic change in practice, but such revised measures could then claim to be true measures of overall health. The other option would be to leave the metrics themselves untouched but to offer some kind of justification for current practices. A health inspector measuring freezer temperatures may only need a thermometer that goes to 0°C.<sup>25</sup> Temperatures below that are real temperatures, of course, but they’re not relevant, given the health inspector’s goals. Similarly, we might try to argue that, although there are real health differences between people with average and above average health, those differences aren’t important, given the purposes for which these health metrics are used.

Now, this kind of argument can’t be universally applicable, I think. Health metrics are used for some purposes (e.g. measuring overall population

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<sup>25</sup> I thank Dan Wikler for suggesting this example.

health and calculating the cost-effectiveness of interventions) that require measuring the full range of health. But an argument like it does have plausibility in many of the other contexts in which health metrics are used. We frequently measure health in order to determine where to allocate resources. Philosophers coming from many different moral perspectives agree that it is generally of greater moral urgency to attend to those who are worse off. So, it might seem that if our aim in measuring health is to determine how to distribute resources, then it will be especially important to learn about the people who are at the bottom end of the health spectrum. Accordingly, just as the health inspector only needs a thermometer that goes down to 0°C, the health policy maker only needs data that cover those at the bottom of the health spectrum, since those people are the ones to whom policy makers should attend.

Is this argument a good one? It's a bit hard to evaluate until it's fully out on the table. That is, in one sense, the point. Those who want to continue using traditional metrics need to first think carefully about the purposes for which they're using the information they gather, and then (if appropriate) offer an argument for why those purposes don't require a fuller measure of health. Such an argument may be out there, but it hasn't been given yet, so those who want to continue using existing health metrics bear an unshouldered argumentative burden.

I suspect, though, that the burden will prove difficult to meet. It seems to me that mid-range differences in health can be of great moral importance, and so ought to be of concern when these measures are used to determine resource allocation. First, higher health status might partially compensate for other deficits. If we're interested in helping the worst off, according to most moral theories we shouldn't be especially concerned about helping the worst off *with respect to health*. Instead, we should be trying to help those who are worst off *overall* (Hausman 2007). Health is, at most, one component of well-being. Suppose we have two populations, both of which are poorly off economically and educationally. One of the populations experiences normal health, but the other has extraordinarily good health. The extraordinarily healthy population is, I think, clearly better off overall. In such a case, a policy maker interested in helping the worst off would need a health metric that distinguished mid- from upper-range health.

Mid-range health differences can also matter in other ways. Malnutrition and parasitic infections cause small but significant intelligence losses in whole populations in many parts of the world (WHO 2005, Berkman *et al.* 2002; *cf.* Eppig 2010). The net social and economic effect of this collective loss in intelligence can be huge. Given the effective and relatively inexpensive treatments available, it seems that this is exactly the kind of thing that should be a priority for resource allocation. However, as Wikler (*forthcoming*) points out, this cognitive loss will likely be missed by many traditional health metrics. The problem is that a drop of five IQ points won't take most people out of the normal range for intelligence.

Someone whose IQ drops from 100 to 95 or from 90 to 85 as a result of a roundworm infection will still be within the Boorsean “typical” range. That loss therefore won’t be registered by health metrics which focus only on the bottom of the range of health. It’s important to note that this is *not* because the loss of intelligence is too small to measure. The problem is *where* the loss occurs. Since it largely affects people who can lose five IQ points without being labeled as having a cognitive disability, it won’t be picked up by metrics that don’t measure the middle range of cognitive function. If health problems such as this seem like they should be priorities for resource allocation, then we should reject the idea that measures of health can justifiably ignore the middle and upper portions of the spectrum of health.

If either of these cases is convincing -- if very good health can compensate for or counterbalance other deficits, or if many small mid-range health effects can collectively add up to a significant one -- then we need to rethink the way we measure health. If comparativism is correct, we should revise our metrics, so that they can capture a fuller portion of the range of health.

We’ve seen, then, several respects in which moving to a comparativist account of health has important consequences for the philosophy of medicine, for bioethics, and (especially) for the measurement of health. I think there are others, but hope that these three are enough to show that the truth of comparativism matters. If the early sections of this article succeeded in showing that comparativism is a reasonable proposal, and if the middle sections have shown that there are some advantages to a comparativist account, then this last section should make it clear that comparativism is definitely worth investigating further.

#### REFERENCES

- Ananth, M. (2008). *In Defense of an Evolutionary Concept of Health*. Hampshire: Ashgate.
- Baur, J.A., Pearson, K.J., et al. (2006). “Resveratrol improves health and survival of mice on a high-calorie diet,” *Nature* 444(7117): 337-42.
- Berkman, D.S., Lescano, A.G., Gilman, R.G., Lopez, S.L., and Black, M.M. (2002). “Effects of stunting, diarrhoeal disease, and parasitic infection during infancy on cognition in late childhood: a follow-up study,” *The Lancet* 359: 564-71.
- Bok, S. (2008). “WHO Definition of Health, Rethinking the,” in *International Encyclopedia of Public Health*, vol. 6 (ed. Heggenhougen and Quah). San Diego: Academic Press, 590-7.
- Boorse, C. (1997). “Health as a Theoretical Concept,” *Philosophy of Science* 44: 542-573.
- Boorse, C. (1977). “A rebuttal on health,” in *What is disease?* (ed. Humber and Almeder). Totowa, NJ: Humana Press, 3-143.
- Engelhardt, H. T. (2008). “Foreward,” in *In Defense of an Evolutionary Concept of Health*. Hampshire: Ashgate.
- Eppig, C., Fincher, C.L., and Thornhill, R. (2010). “Parasite prevalence and the worldwide distribution of cognitive ability,” *Proceedings of the Royal Society B*. Available online in advance of publication.

- Ereshfsky, M. (2009). "Defining 'health' and 'disease,'" *Studies in History and Philosophy of Biological and Biomedical Sciences* 40: 221-227.
- Everitt, A.V., Rattan, S.I.S., Couteur, D.G.I., de Cabo, R. (eds.) (2010). *Calorie Restriction, Aging, and Longevity*. Dordrecht: Springer.
- Guerrero, J.D. (2010, *in press*). "On a naturalist theory of health: a critique," *Studies in History and Philosophy of Biological and Biomedical Sciences*, doi:10.1016/j.shpsc.2009.12.008.
- Hare, R.M. (1986). "Health," *Journal of Medical Ethics* 12(4): 174-81.
- Hausman, D. (2010). "Valuing Health: a New Proposal," *Health Economics* 19: 280-296.
- Hausman, D. (2007). "What's Wrong with Health Inequalities?" *The Journal of Political Philosophy* 15(1): 46-66.
- Hausman, D. (2006). "Valuing Health," *Philosophy and Public Affairs* 34(3): 246-274.
- Kass, L. (2003). "Beyond Therapy: Biotechnology and the Pursuit of Human Improvement," working paper presented to the President's Council on Bioethics, 16 January 2003. Available at <http://bioethics.georgetown.edu/pcbe/background/kasspaper.html>.
- Kennedy, C. (2007). "Vagueness and grammar: the semantics of relative and absolute gradable adjectives," *Linguistics and Philosophy* 30: 1-45.
- Kingma, E. (2010). "Paracetamol, Poison, and Polio: Why Boorse's Account of Function Fails to Distinguish Health and Disease," *British Journal of the Philosophy of Science* 61: 241-264.
- Kingma, E. (2007). "What is it to healthy?" *Analysis* 67(2): 128-33.
- Kovács, J. (1998). "The concept of health and disease," *Medicine, Health Care and Philosophy* 1: 31-39.
- Lewontin, R. (2001). *The Triple Helix*. Cambridge: Harvard University Press.
- Macklin, R. (1972). "Mental Health and Mental Illness: Some Problems of Definition and Concept Formation," *Philosophy of Science* 39(3): 341-365.
- Murphy, D. (2008). "Concepts of Disease and Health," *The Stanford Encyclopedia of Philosophy (Summer 2009 Edition)* (ed. Zalta). <http://plato.stanford.edu/entries/health-disease/>.
- Murray, C.J.L., Salomon, J.A., and Mathers, C. (2002). "The Individual Basis for Summary Measures of Population Health," in *Summary Measures of Population Health: Concepts, Ethics, Measurement and Application* (ed. Murray *et al.*), Geneva: World Health Organization: 41-51.
- Murray, C.J.L., Salomon, J.A., and Mathers, C. (2000). "A critical examination of summary measures of population health," *Bulletin of the World Health Organization* 78(8): 981-991.
- Nordenfelt, L. (2007). "Establishing a middle-range position in the theory of health: A reply to my critics," *Medicine, Health Care and Philosophy* 10: 29-32.
- Nordenfelt, L. (1995). *On the Nature of Health: An Action-Theoretic Perspective (2nd ed.)*. Dordrecht: Kluwer.
- Papineau, D. (1994). "Mental Disorder, Illness, and Biological Disfunction," in *Philosophy, Psychology, and Psychiatry* (ed. Griffiths). Cambridge: Cambridge University Press.
- Richman, K. (2004). *Ethics and The Metaphysics of Medicine*. Cambridge: MIT Press.
- Rusiecki, J. (1985). *On adjectives and comparison in English*. New York: Longman Linguistics Library.
- Ryff, C. and Singer, B. (2000). "Interpersonal Flourishing: A Positive Health Agenda for the New Millennium," *Personality and Social Psychology Review* 4(1): 30-44.
- Ryff, C. and Singer, B. (1998). "The Contours of Positive Human Health," *Psychological Inquiry* 9(1): 1-28.
- Sandel, M. (2007). *The Case against Perfection: Ethics in the Age of Genetic Engineering*. Cambridge: Harvard University Press.
- Sandel, M. (2004). "The case against perfection," *Atlantic Monthly* 293(3): 51-62.
- Schroeder, S.A. (*unpublished*). "Idiopathic Short Stature, Health, and Levels of Functional Organization."
- Sigerist, H. (1941). *Medicine and Human Welfare*. New York: Oxford University Press.
- Szasz, T. (1961). *The Myth of Mental Illness: Foundations of a Theory of Personal Conduct*. New York: Harper & Row.
- Unger, P. (1975). *Ignorance*. Oxford: Clarendon Press.
- Wakefield, J.C. (1992). "The Concept of Mental Disorder," *American Psychologist* 47: 373-388.
- World Health Organization (WHO) (2005). "Deworming for Health and Development." Available online at [http://whqlibdoc.who.int/hq/2005/who\\_cds\\_cpe\\_pvc\\_2005.14.pdf](http://whqlibdoc.who.int/hq/2005/who_cds_cpe_pvc_2005.14.pdf).
- World Health Organization (WHO) (1948). *Constitution of the World Health Organization*. Available online at [http://www.who.int/governance/eb/who\\_constitution\\_en.pdf](http://www.who.int/governance/eb/who_constitution_en.pdf).
- Wikler, Daniel (*forthcoming*). "Cognitive Disability, Paternalism, and the Global Burden of Disease," to appear in *Metaphilosophy*.