

How to proceed in the disease concept debate? A pragmatic approach.

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Abstract

In the traditional philosophical debate over different conceptual analyses of 'disease', it is often presupposed that 'disease' is univocally definable and that there are clear boundaries which distinguish this univocal category 'disease' from the category of 'non-disease'. In this paper, I will argue for a shift in the discussion on the concept of 'disease', and propose an alternative, pragmatic approach which is based on the conviction that 'disease' is not a theoretical concept, but a practical term. I develop a view on which our use of the term 'disease' is determined by two interacting factors, namely value-laden considerations about the (un)desirability of certain states, and discoveries of cause(s) which is/ are explanatorily relevant. I show how these factors interact with regard to a taxonomy of kinds of diseases. This pragmatic approach will not lead me to a final definition of 'disease', but results in a more realistic description of the way we build, use, apply and change our concept of 'disease' and is meanwhile useful as a basis for critical reflection on disease labeling in medicine.

Keywords

disease concept, conceptual analysis, scientific practice, pragmatic approach

1. Introduction

In philosophy of medicine, we are far from a consensus on what a disease precisely is. Further, while intuition leads us to view and handle mental and physical diseases as different kinds of things, philosophers often try to define a single concept of 'disease', covering both physical and mental diseases. Most of the philosophical literature on the concept of disease indeed starts from a monolithic position, from which it is supposed that 'disease' is univocally definable and that there are clear boundaries which distinguish the univocal category 'disease' from the category of 'non-disease'. Conceptual analysis is traditionally conceived of as *the* philosophical tool that will help us in discovering the correct, univocal definition of 'disease'. In this paper, I will argue that we should stop trying to find *the* definition of disease and reconsider the traditional debate over different conceptual analyses of 'disease'. I propose an alternative, pragmatic route that will not lead to a final definition, but results, I argue, in a more realistic description of the way we build, use, apply and change our concept of 'disease'. I will also argue that the pragmatic framework offers a better basis for critical reflection on disease labeling in medical practice than the particular traditional conceptual analyses can offer.

In section 2, I will explain why it seems impossible for philosophers in the traditional debate to meet their general goal of neatly defining 'disease' by means of traditional conceptual analysis. In section 3, I explore possible ways of proceeding given the impasse described in section 2. I argue that we should start from the variability in the actual use of the disease concept in medical practice. In section 4, I develop the details of the alternate, pragmatic approach that starts from the conviction that the concept of 'disease' is a variable, practical term. I will argue that our use of the term is determined by two interacting factors: value-laden considerations about the (un)desirability of certain physiological and/or psychological states and discoveries of bodily and/or psychological cause(s) which is/ are explanatorily relevant in view of possible medical interventions that can prevent, cure, or at least improve these undesired states. While the suggestion that both naturalistic description of and value-laden considerations about particular states are both relevant to their designation as disease states is not new, my pragmatic approach provides a way of understanding how these can interact differently with regard to different kinds of disease. I draw on Nick Haslam's

(2002) approach to “kinds of kinds” of mental disorders to show how such interaction can result in different kinds of disease categories, extending his discussion to physical disease and showing how the different kinds he identifies involve each of the above factors. The pragmatic approach implies that disease and non-disease can no longer be thought of as clearly delineable in general, but only for some specific categories of diseases. For a lot of conditions that we label ‘disease’, the boundary between disease and non-disease is not clear but vague and disputable. Within the pragmatic approach to the concept of disease a single, univocal account of what distinguishes disease from non-disease cannot be given. In section 5, I comment on the different role played by counterexamples in the pragmatic approach, in comparison with their role in traditional conceptual analyses. In section 6, I deal with possible counterarguments and further worries regarding the pragmatic approach. Eventually, I come to final conclusions in section 7.

2. Unachieved goals in the traditional concept of disease debate.

In general, one can discern three kinds of philosophical definitions of ‘disease’, namely naturalist (e.g. Boorse 1977) and normative (e.g. Goosens 1980 and Culver and Gert 1982) definitions (or dysfunction-requiring and value-requiring definitions, cf. Schwartz 2007), and definitions that require a combination of both values and dysfunctions (the best-known example of this kind can be found in Wakefield (1992)). I will not go into detail about the different accounts and their shortcomings,¹ as there is already an abundant literature providing such detail (see e.g. Schwartz 2007, Cooper 2007 and Ananth 2008). In this section, I will focus on the general goals and presuppositions underlying the traditional debate and on the problems that arise with them.

I would like to start by pointing out that - although all the different kinds of disease definitions proposed in the literature have some problems to deal with - it seems to be the case that all of these definitions *do* fit our intuitive notion of disease to a considerable extent. In that sense, it would

¹ A more thorough discussion of problems with the background suppositions of Wakefield's analysis can be found in De Vreese, forthcoming.

be unfair to argue that their different criteria are totally irrelevant. But on the other hand, none of the traditional definitions can live up to its promise of neatly defining what a 'disease' is. All kinds of definitions have been contradicted in the literature on the basis of counterexamples.² Authors nonetheless keep arguing and counter arguing about the 'right' definition of 'disease'. The way they do, uncovers their general underlying presuppositions, namely (1) that it should be possible to find a single, clearly delineating definition of what a 'disease' is, (2) that on the basis of such a definition one would be able to clearly distinguish diseases from non-diseases and (3), that all human conditions gathered under this definition will be of a single, uniform kind. Additionally, most philosophers hold that their definition should be seen as a general definition, embracing both physical and mental diseases. But all this seems too much to expect from a single, monolithic definition. The counterexamples to disease definitions in the literature indicate that the definitions are too narrow to cover all diseases, or, on the other hand, too broad to exclude non-diseases. This is not surprising, but results from general problems of traditional conceptual analysis (i.e., analyses of concepts that make presuppositions like those above, that a single, clearly delineating definition that will enable clear judgements about its extension to be made). Schwartz provides detailed argument that traditional conceptual analysis will inevitably have this kind of problem:

As scientists have acquired better and better understanding of diseases and their causes, they find not a unifying microstructure, as for gold or water, but variation. While many have sought an essence that all and only diseases share, this quest has been blocked at every step by variability and heterogeneity. Any definition that would draw a sharp line through all conditions, determining for each whether it is a disease or not, looks like the imposition of a decision, rather than the application of a discovery.

² For instance, some normativist theories have been critiqued for seemingly confirming socially defined 'deviancy' to be disease, such as masturbation in nineteenth century America; naturalist theories have been critiqued for implying that one dead cell is disease; and theories requiring values and dysfunctions have been critiqued for excluding 'trivial' states such as minor skin infections from counting as diseases. For detailed discussions of the role counterexamples have played in the disease debate, see Schwartz (2007, 50-56), Worrall and Worrall (2001, 39-48).

This means adopting any precise account will impose at least some changes on our currently non-reflective and relatively unprincipled way of distinguishing disease from health. Choosing a definition will partly involve deciding which changes from current practice are acceptable. (Schwartz 2007, 59)

Traditional conceptual analysis can have two goals: either it aims for a descriptive account that tries to line up nicely with our intuitions, or it aims for a revisionist account that clears out the inconsistencies in our intuitions. The problems for such a conceptual analyses of 'disease' are clear. Since our intuitions about what diseases are clearly differ (e.g. the different definitions proposed in the philosophical literature, but also the differing intuitions among medical doctors (see Campbell et al 1979 and Smith 2002)) and given that medical scientists themselves are confronted with variability and heterogeneity when studying diseases (cf. quote above), it seems impossible to discover a univocal essence of what it means to be 'diseased' and hence, to give a justified descriptive account of the concept via the method of traditional conceptual analysis.³ Consequently, privileging one or another of these analyses as the 'right' one automatically results in a revision of the everyday use and meaning of the concept in light of this decision. In other words, any conceptual analysis of disease resulting in a monolithic definition seems to lead to a revisionist account instead of a descriptive one. The question that follows is whether we really want to revise the concept or whether we prefer an analysis which corresponds with the concept's actual use⁴. When considering this, we should recognize that it is unclear on what basis one can privilege one account above the others as the single one to be used. The only possible justification for such a

³ My argument here cannot totally exclude the possibility that one might once find a monolithic, justified definition of the concept via the method of traditional conceptual analysis. The argument rather amounts to the claim that we have very good reasons to think that conceptual analysis will never succeed at its task. Detailed arguments for the impossibility are nonetheless provided by Nordby (2006), whose argument draws on Quinean critiques of the analytic-synthetic distinction, and Schwartz (2007, 56-9), who argues that traditional conceptual analysis relies on conceptions of meaning that are necessarily problematic.

⁴ After all, one can wonder whether medical scientists and practitioners will change their mind on whether, for example, ADHD is a 'real' disease, on the basis of a revisionist philosophical definition of 'disease' according to which it is not. (cf. De Vreese 2014).

choice seems to be the intuitions one already had beforehand about whether or not particular diseases are 'true' cases of disease or not. In other words, presuppositions with respect to what diseases are seemingly always form the basis for building and/ or accepting a specific definition. Indeed, one can hardly deny that all proposed definitions are based on presuppositions on what is a disease and what not. Hence, it seems impossible to give an a priori definition on the basis of which one can decide on a neutral basis which 'diseases' fit in with the definition.⁵

3. How to proceed? Medical practice as a starting point.

The impasse described in the previous section has led some authors to argue that we should give up the whole enterprise of the traditional conceptual analysis of 'disease'. One of these authors, Schwartz, actually proposed to bite the bullet and to "*let there be variability and free choice*" (Schwartz 2007, 61). His main argument for this is exactly that the desiderata of a traditional conceptual analysis have not been fulfilled and consequently, that we have reason to think that such analysis of the disease concept cannot succeed at its task of discovering the single, correct definition of 'disease'. Hesslow (1993) gives a different argument for leaving the traditional debate behind. He argues that too much emphasis on the conceptual issues muddles the really important ones:

Diseases are to the clinicians what gardens are to gardeners or cars to garage mechanics. These terms are handy to point to a certain area of competence, but the gardener does not need a definition of "garden" to help him decide what to do about plants on a balcony and the garage mechanic does not need a definition of "car" to be able to decide if he

⁵ One response to such arguments may be to accept these points but regard the circularity to be non-vicious. Some theorists do recognize and seem to accept that they offer an account of disease that partly revises, rather than simply describing, current use. However, such accounts are typically presented as traditional conceptual analyses, and so as aiming to capture the underlying meaning of the term. As such, it has not generally been recognized how significantly this alters how such accounts should be regarded (i.e., as at least partly stipulative), and what implications this has for methodology in the disease debate (e.g., for the role of counterexamples, which I discuss further in section 5). I thank an anonymous reviewer for pushing me on this point. For more detail see Schwartz (2007, 59-61); Nordby (2006, 177).

should try to fix a lawnmower. “Disease” is a useful term, because, like “car” it gives a brief simple reference to a certain class of things which *to some extent* coincide with an area of competence. It is not identical to this area, however, and a deeper understanding of what this area is requires knowledge of the competence itself and how it can be used, rather than of the objects on which it is normally used. (Hesslow 1993, 13, emphasis in original)

A similar argument can be found in Kincaid (2008), who states that we do not need nicely defined natural kinds for good science. Medicine is a science in which we understand causes in a piecemeal way, and in which we focus particularly on causes that we can manipulate, doing well without complete theories and nicely delineated natural ‘disease’ kinds. By looking at the actual practice of research into cancer, Kincaid demonstrates that there is no definition of what precisely constitutes a cancerous cell, nor a parsimonious theory showing where normal functioning ends and malfunctioning begins in the case of uncontrolled cell division. Nevertheless, cancer research offers causal bits and pieces which do further our understanding and which helps us in making progress in the development of treatments without a full-blown theory defining and delineating cancer as a natural disease kind.

The argument of the latter two authors hints at another argument, namely that ‘disease’ is a practical concept. Miller Brown (1985) argues extensively for this, against Boorse (1977), who defends the claim that health and disease are value-free theoretical notions⁶. Miller Brown states that philosophers are wrong in thinking that they can delineate the nature of disease as a theoretical concept. He argues as follows. If ‘disease’ were a theoretical concept, this would mean that it is a basic concept in theoretical biology or in one of its subdisciplines, on which medicine relies, or it would figure as a basic concept in a separate scientific discipline of “theoretical medicine”. Miller Brown (1977) claims that none of these possibilities is defensible.⁷ Therefore, ‘disease’ is not a

⁶ According to Boorse (1977), diseases are deviations from the species biological design. Therefore, “their recognition is a matter of natural science, not evaluative decision” (Boorse 1977, 543).

⁷ For the full argument, see Miller Brown (1985), p. 323-327.

theoretical concept. The reason some authors are nonetheless convinced that it is, results from the denial of the nature of medicine as a *practical* discipline:

However understandable and even useful this philosophical search for fundamental similarities among diseases, it seems to assume that philosophical definition will make a contribution to medical theory. ... This is a mistake, I think, which lies in the assumption that there is a theory of medicine to which such analyses can contribute. (Miller Brown 1985, 324)

Theory in medicine, as in electronics, is borrowed from fundamental sciences like biology, chemistry, and physics. Research in medicine, when it is not biology, chemistry, and physics, is a kind of technological enterprise allied to these sciences and only rarely leading directly to development in theory. ... As a practical discipline, medicine and its concepts of 'disease' and 'health' are bound up with medical practice and the interests of doctors and patients as well as with the advances of science. And it is this fact which adds to the complexity and variety that confounds efforts to find simple definitions. (Miller Brown 1985, 326)

I follow Miller Brown (1985) in his conviction that, for these reasons, 'disease' can best be characterized as a practical concept, which means that its varying meanings and uses are inevitably influenced by the practical and evolving nature of medicine and that the concept is intrinsically value-laden⁸. In consequence, I also agree with Schwartz (2007) and Miller Brown (1980) that we should recognize the (resulting) complexity and variability of the disease concept and that this implies that we should stop trying to discover *the* correct definition of disease. The recognition that 'disease' is a complex and variable practical concept also helps to explain why the

⁸ This discussion brings me to the debate on the role of values in science and scientific practice (or medicine and medical practice in particular). Although it would be interesting to go deeper into this issue in relation to what I write here, this would bring me too far away from my core message. However, for a very interesting and focussed discussion of how "values affect our concepts of health and disease at all levels", which also adds to the view of Miller Brown (1985), see the paper of De Vito (2000) in this journal. Note that this does not mean that naturalistically describable biological states do not also influence the concept, and the discussion in section 4 will elaborate on how these different influences interact.

concept is unfit for straightforward descriptive conceptual analyses (cf. the previous section). Finally, I agree with the view of Hesslow (1993) and Kincaid (2008) that we do not always need a nicely delineated definition of disease (as a natural kind) to achieve good medical knowledge and make good medical decisions. However, I do not believe that these arguments form good reasons for totally dismissing the more general goal that philosophers set themselves when they were looking for a definition of disease, i.e., to give a basis for critical reflection about the application of the 'disease' notion. Schwartz's, Hesslow's, Kincaid's and Brown's points of view are of no help when we are in need of a basis - or at least a point of comparison - for evaluating our attribution of disease labels. After all, 'diseases' are not like 'gardens' and 'cars' in the sense that deciding whether or not to think about certain physical and psychological states as 'diseases' has important personal and social consequences. Although medical science might proceed well without a clear definition of 'disease', it seems undeniable that the health/disease distinctions made on the basis of tacit understandings of the disease notion *do* play an important role in the background of healthcare-related research and decision-making processes (clinical, moral, legal, social or otherwise), which might have important consequences in practice. For example, there are problems of medicalization and the expansion of our disease notion: if what we, as a society, include and treat as a disease involves an ever increasing number of conditions, this will have various effects: the number of people who are perceived as diseased, the way we will treat those people, the attribution of research funds, the growing costs for healthcare, etc.⁹ Further, it is true that practitioners are probably very well aware of the diversity in diseases and disease kinds and do not worry too much about whether what they treat are 'real' diseases. But at this individual level of the doctor-patient interaction the danger of medicalization also lurks: practitioners might tend to classify people's problems too easily as diseases and treat them accordingly, given that they were trained

⁹ Remarkable in this respect is, for example, Bircher's comment on the WHO-definition of health: "*Since the WHO-definition of health requires complete physical, mental and social well-being, in today's societies everybody is a patient and it is not surprising that the demands made on the health care system by the public are unlimited. This presumably is one of the reasons for the growing costs of health care in developed countries.*" (Bircher 2005, 340).

and work in a strictly scientific-medical setting within which disease labels might be too easily taken for granted. For such reasons, it seems very useful to get a better grip on the diversity in the practical use of the disease notion, and to be able to reflect against this background on the justification for including and excluding certain conditions as 'diseases'. My aim in arguing for a pragmatic framework is precisely to relate the analysis of the disease notion to the practice of medicine, but meanwhile to abstract from that practice to give an approximately correct description that is useful for practitioners as a basis for further reflection on the discipline's use of the disease notion.¹⁰ This may sound circular, in that it involves both drawing on the practice of medicine to abstract a notion 'disease', while drawing on an abstracted notion of disease to reflect on (and perhaps alter) practice. And yes, in a certain sense it is. However, I would argue that it is spiral, rather than circular. It is a recurring 2-step process in which results of the second, reflective step will feed back into the first, descriptive step. As a result, we will deepen our understanding of what diseases can be, and ameliorate our argumentation for labeling conditions as (one or another kind of) disease. As I argued above, if we do not want to argue for arbitrary revisions, we have no other choice than to start from how we already think and talk about diseases.

Several other authors have, in the last couple of years, argued for new directions in the debate on the concept of disease. Khushf (2007) has argued that we should no longer focus on the contrast between naturalists and normativists, since – as he argues – both try to screen off medical science from the inappropriate intrusion of socioeconomic factors which threaten the integrity of modern medicine. Rather, he argues, we should reframe the debate as a debate between weak and strong normativists. Both camps would recognize that values are integral to health concepts, but the central question in the renewed debate then becomes whether or not we are able to tease out the facts from the values. Lemoine (2013) argues that conceptual analysis will not help us in deciding

¹⁰ I am thus proposing an 'analysis' of the concept 'disease', albeit not a traditional conceptual analysis, insofar as I have dropped the assumptions regarding the possibility of discovering a univocal definition with clear boundaries.

between naturalism and normativism and that the only possible route to a decision is by answering the question whether the concept of disease can be naturalized, which means examining whether there is a consistent natural concept for each particular condition that is taken to be a disease. Both authors still start from the supposition that there is a battle to be fought out regarding the role of facts and values in our disease notion. They do not recognize the diversity of disease kinds that we can discern in our actual use of the concept in practice and they do not try to explore the different and variable ways in which our factual knowledge and value considerations play a role and interact in these diverse cases. On the contrary, the recognition of different disease kinds and of the different ways in which our factual knowledge and value considerations interact are at the heart of the pragmatic approach that I will defend in this paper.

In the next section, I try to make clear how a pragmatic approach could be filled in, by relying on and elaborating the work of Nick Haslam (2002). I do not claim that the pragmatic approach as presented in the next section is final. My primary aim in offering this account is to make more concrete how the debate on the disease concept might proceed in a more fruitful direction by starting from a pragmatic point of view. The precise outline of my pragmatic approach should therefore in the first place be taken as a concrete example of the kind of approach that I am arguing for.

4. A pragmatist alternative

4.1. Basic idea

I already stated that the different criteria used in traditional conceptual analyses are clearly not totally irrelevant and *do* seem to bear on how we conceive of 'disease'. I even believe that we do need values and facts as criteria in an alternative approach. However, my view on the way in which values and facts interact in determining what we label as 'disease' will differ from traditional views. In the following sections, I will offer a kind of '*originative*' approach to our disease concept, in which

value considerations and fact considerations will interact. In doing this, I build further on the following distinction made by Ereshefsky (2009):

Instead of trying to find the correct definitions of 'health' and 'disease' we should explicitly talk about the considerations that are central in medical discussions, namely state descriptions (descriptions of physiological or psychological states) and normative claims (claims about what states we value or disvalue). (Ereshefsky 2009, 221)

State descriptions provide us with neutral, scientific descriptions of the physiological or psychological state of a person. In state descriptions, one tries to eliminate all normative elements and functional claims. They can, for example, describe the results of measurements such as the amount of a certain vitamin or mineral in the patient's blood or tissues. Or they can give a psychological description of how a person feels or a more technical description of a person's psychological state. Normative claims, on the other hand, add explicit value judgments about which states we should value and disvalue. (Ereshefsky 2009, 225).

An example from De Vito (2000, 561-562) further clarifies this distinction: we can describe in a neutral way that some patient has a duodenal ulceration caused by the presence of the bacteria *H. Pylori* and that this has certain effects on other biological systems, such as the nervous and digestive systems. But these facts about the body of the patient do not themselves imply that this state should be disvalued. And while we disvalue the effects of *H. Pylori* in the gastro-intestinal system, we are indifferent to the effects of other species of bacteria in this system, such as *E. Coli*. As De Vito (2000) argues, this difference in our judgments is not due to the plain facts about the body states that we are concerned with, but to our evaluation of the effects of the different species of bacteria.

This can also be related to the following quote from Miller Brown (1985), in which he implicitly clarifies the relation between normative and descriptive considerations in the *practical* use of the disease notion:

If medicine begins, as I think it does, in crisis and treatment, then it begins with a variety of circumstances which may characterize illness and disease (which are, as it were, the

criterion characteristics of 'disease'): the involuntary occurrence of pain, suffering and illness, gross physical dysfunction, disfigurement or progressive debility, statistically abnormal structures or processes, the discovery of causal agents of such conditions, the development of techniques for changing undesirable or unwanted conditions, or the disruption of social roles. The physician relies on biology and other fields to find the causal, not conceptual, factors which correlate and explain such circumstances and characteristics. (p. 326)

Miller Brown mixes up value criteria with more objective criteria in the above list. However, the final sentence of this citation makes a very important point, which sheds light on how value criteria and fact criteria interact. This leads me to the following, general view of disease, which I will further elaborate in the following sections:

'Disease' is not a theoretical concept, but a *practical* term. Our use of the term is determined by two *interacting* factors:

A) Value-laden considerations about the (un)desirability of certain physiological and/or psychological states.

B) Discoveries of bodily and/or psychological cause(s) which is/ are explanatorily relevant in view of possible medical interventions that can prevent, cure, or at least improve undesired states.

4.2. Undesirable states

The value criteria traditionally cited in normative analyses of disease are not determining, but nonetheless needed in the first place for (loosely) indicating the kind of states we are talking about when using the 'disease' concept. We cannot start assembling facts about diseases and disease causation if we do not have at least a basic idea of the bodily and psychological states we are talking about when using the word 'disease'. This means that traditional criteria such as the occurrence of harm, pain, suffering, dysfunction, abnormalities, etc., refer to important grounds for considering a certain state of mind and/ or body *eligible* for being labeled 'disease'. This is not to claim that these criteria determine what diseases are. The question they help to answer is not the

one they were traditionally supposed to answer, namely “what is a disease?” The question they answer, according to my view, is rather “what makes a certain state eligible for being considered as a disease?” This relates to the practical nature of medicine in the sense that it is what we want medicine to achieve -- our reasons for seeking out the intervention of medical professionals (i.e. preserving us from undesired states) -- that forms the basis for picking out states as candidate ‘diseases’. Factual description of the undesired states, and attempts to understand their cause(s) form a necessary complement, but this science is in the first place guided in its development and application by this identification of candidate diseases on the basis of value considerations. In other words, the goals of medicine as a science are essentially value-laden. Certain states are conceived of as eligible for being disease states on the basis that we disvalue them because they deviate from certain idealized states of our body and mind¹¹. If medicine recognizes them as real diseases (on the basis of knowledge about the underlying causes, cf. section 4.3), this automatically implies that they should ideally be preventable or curable by medical means, which then becomes the goal that medicine sets itself. It is very important here to see that it is not nature but we ourselves who make the basic distinction between desirable and undesirable states on the basis of value-laden criteria, as was demonstrated by De Vito’s (2000) example of duodenal ulceration in section 4.1. However, this does not alter the fact that there will often be real differences in the causal structures underlying differently evaluated states. As Miller Brown (1985) claimed in the last sentence of the above citation, it is the task of medicine to investigate these underlying facts, and to decide whether they are of a kind that can justify a ‘disease’ label. This brings us to part B of my analysis.

4.3. Disease causation

As I explained, medicine studies the facts underlying disvalued bodily and psychological states. However, it is not the goal of medicine to give the full and complex description of the whole causal setting that leads up to a disvalued state, since the details might differ even between different

¹¹ Note that what count as “idealized states of body and mind” might also be influenced by socially and culturally relative convictions.

persons that seem to be in a similar disvalued state. As Kincaid (2008) points out, medicine is a practical science focusing primarily on manipulable causes. This means that medicine does not focus on the whole causal explanation but makes causal selections of what it takes to be relevant factors. Hence, whether (a) certain cause(s) should be selected as (a) difference-making cause(s) between the desired and the undesired state is decided on the basis of their *explanatory relevance for medicine*. For instance, we know lung cancer occurs in much higher rates among smokers compared to non-smokers, and among men as compared to women. But only the former would be regarded as explanatory relevant in understanding the physiological causes of smoking (though the latter might be relevant in understanding its social determinants). In line with Broadbent (2009), I am convinced that a contrastive model of disease causation is the best one to describe how medicine conceives of disease causes. Medicine focusses on contrasts (between a person or group of people suffering from a (set of) symptom(s) of an undesired bodily or psychological state and a relevant contrast class¹² in which such (a) symptom(s) are absent) and the causal factors that make the difference between the contrasted pair, Thinking in terms of contrasts leads medical science to what it is looking for: explanatorily relevant causes. It is true that you need a contrast to find these, given the complexity and necessarily multifactorial nature of the causation of disease. However, unlike Broadbent (2009), I maintain that the choices of these contrasts are not neutral, but guided by what we already conceive of as desirable and undesirable states. In other words, the choice for contrast classes is guided by value considerations about what are the (more) desirable states. Medicine's selection of certain causes as explanatorily relevant implies the conviction that medicine should ideally be able to prevent, cure or improve the resulting disvalued state, and that our scientific knowledge would also support such an intervention¹³. Whether medical practitioners really

¹² As Broadbent (2009) argues, choosing the appropriate contrast class is of crucial importance for getting a grasp on the explanatorily relevant factors for a certain state. Often we will be looking for what makes the difference, generally, between a group of people suffering from a certain undesired state and a group of healthy people. But it might also be appropriate to contrast between groups of people of e.g. a same age, gender, geographic location,... to grasp the relevant causal differences between their bodily and/or psychological states.

¹³ See the example on teething in section five for further clarification on this latter constraint.

can intervene in the right way depends of course on the state of medical know-how and is subject to developments in medical knowledge. It is true that the difference-making causes are actually not always known in cases where medicine nonetheless intervenes, for example when prescribing psychopharmacological drugs to intervene in 'mental diseases'. In such cases, it is the (sometimes accidental¹⁴) finding that certain treatments work to change certain disvalued states, that lead to the conviction that they have a specific bodily cause which is directly influenced by the treatment, and which medicine should be able to specify in the future.

4.4. Interaction

On the one hand we have our considerations about desirable and undesirable states, on the other hand, we have scientific knowledge about underlying causes that lead to certain states. However, these two factors do not stand apart, and should not simply be added together to make a 'disease' (as in the case of traditional hybrid theories). The two factors do not form a unidirectional two-step recipe for deciding whether or not certain states deserve the label 'disease'. It is crucial to see the ongoing interaction between, and weighing of, these two factors. Finding explanatorily relevant difference-makers for a state that we consider as eligible to be called 'disease', and which make it possible medically to intervene, will form an important confirmation of the 'disease' status. For instance, the possibility of intervening to lower cholesterol to less risky levels using statins has reportedly led to high cholesterol being increasingly regarded as a disease (Jovanovic 2014). And osteoporosis has come to be regarded as a disease rather than a risk factor over the last 30 years, following developments in diagnostic methods using measures of bone-mineral density (Jarvinen et al 2015). The reverse is also true. If we find a clear causal difference-maker for a certain kind of deviance which we were not readily inclined to consider as a possible 'disease', this might form a basis for a change in our value considerations. For instance, the identification of neurological

¹⁴ Peter Conrad (1975) for example describes how Bradley (1937) discovered the "paradoxical" (because unexpected), subduing effect of amphetamines on children with behavior problems and how this formed an impetus for the "discovery" of hyperkinesia as a disease.

processes behind drug addictions have, for some, confirmed their disease status (e.g., Leshner 1997). On the other hand, a lack of clarity on explanatorily relevant difference-makers for an eligible state will heighten doubt on the aptness of the 'disease' label. This has occurred for the condition known as 'medically unexplained symptoms' or MUS, for instance, sufferers of which not only lack proper diagnoses or prognoses, but often cannot access social welfare support as they have no official disease (Nettleton 2006). Whether or not we label a certain state as 'disease' hence results from an ongoing interaction between, and weighing of, people's value considerations and the knowledge that can confirm the special status of certain disvalued states on a scientific basis. This can also clarify the variability in the disease concept that leads, for example, also to historical changes and cultural differences.¹⁵

4.5. Disease kinds

There is more to be said. A (the value considerations leading to an eligible 'disease' state) and B (the scientific knowledge concerning the relevant difference-making cause(s) of this state) will relate to each other differently in different cases of 'disease'. This leads me to argue that one can discern different kinds of disease categories depending on the kind of causal explanation that can be given for some eligible state. Nick Haslam (2002) proposed a very interesting classification of psychiatric diseases which fits in nicely with this idea. I elaborate on his approach here, in order to give a more concrete idea of what a fruitful, pragmatic approach to the general disease concept might look like. In his proposal for a pluralist view of psychiatric classification, Haslam (2002) starts reasoning from kinds of categories in psychiatric diseases. This results in a conceptual taxonomy, based on distinctions between the kinds of causes which are involved in different categories of disease, the resulting degree to which boundaries of different categories can be objectified, and the roles of factual and evaluative factors in justifying disease status. Haslam (2002) applied his

¹⁵ Extensive historical case studies that can further illustrate these points, can be found in Aronowitz (1998) and Duffin (2005).

theory in terms of kinds of categories to the domain of mental diseases. In what follows, I will give an overview of his different kinds, with examples of physical diseases which would fit in these categories, indicating that Haslam's approach might be widened to 'disease' in general.^{16,17} I use Haslam's approach as an example of how different kinds of 'diseases' might be discerned on the basis of different kinds of causal explanations, without claiming that the account is complete.

The first two kinds of disease categories identified by Haslam are what I like to call 'continuous disease categories'. In both cases, there are no real discontinuities separating the diseased and the non-diseased individuals. Haslam's first continuous kind is the 'non-kind'. In this disease category, one encounters characteristics that are present to differing degrees in the population, so that the characteristics represent a continuum.¹⁸ Such continua result from the fact that, for this (non-)kind of disease, the degree to which the relevant characteristics are present is determined by the accumulation of many small causal influences, leading to a normal distribution among the population. Any binary distinction on this continuum distinguishing non-diseased from diseased individuals would be arbitrary and artificial. The degree of someone's inclination to be happy and optimistic or rather unhappy and pessimistic, to be active or rather lazy, to be patient or rather nervous, and so on, all result from such normal distributions. Even if an individual's characteristic should be situated at an extreme end of a continuum, this is the result of normal distribution and

¹⁶ What makes a physical disease physical and what makes a mental disease mental, forms a basis for discussion on its own (see e.g. Brülde & Radovic 2006). However, I start from the intuitive distinction between these to elaborate the framework that I want to adopt. It suffices to state here, that I follow Brülde and Radovic (2006) in their statement that we make the distinction on the basis of the kind of symptoms involved and/or the kind of (supposed) internal causes of diseases, although this does not happen in a clear and principled way.

¹⁷ I do not have the space here to fully argue for the generalizability of Haslam's account of mental disorders to the notion of disease at large. As pointed out earlier, Haslam's account might even not be extensive enough for that goal. However, for the goal of this paper, it suffices to rely on Haslam's account as it is, and illustrate how it might work within my pragmatic approach by way of examples of both mental and physical diseases which fit in the disease kinds which he discerns. This should give the reader at least a good basic idea of how the pragmatic approach to the disease notion can be further elaborated.

¹⁸ That is, diseases of this (non-)kind are typically multifactorial. Diseases that are mono-causal are unlikely to be of this (non-)kind and would instead fall into one of the final three categories below (Haslam 2002, 205).

hence does not form an objective reason to label this individual 'diseased'. Haslam (2002) gives the example of neuroticism. According to Haslam, neurotics should not be called diseased individuals¹⁹, just as we should not be inclined to call, e.g., an extremely lazy person or an extremely patient person mentally 'ill'. The same holds for physical traits: being very large, having flap-ears, having a lot of freckles and so on, all result from normal distributions of traits. Generally, we will not be inclined to call the people having these traits 'diseased'. However, there are traits (both mental and physical) that result from normal distributions but that we will nonetheless find eligible to be labelled 'disease' in certain extreme forms, even though in fact there is no factually-based reason to do so.²⁰

The second continuous kind of diseases discerned by Haslam is what I will call the spectral kind.²¹ In this kind too, a clear diagnostic threshold is missing. Nonetheless, some scientific findings justify the imposition of a boundary given known consequences of having the characteristic in various degrees. A stipulative distinction for diagnostic purposes will be imposed, such that those whose condition is severe enough for clinical attention will fall in the 'diseased' group, and those whose condition is milder will not be included in this 'diseased' group. As an example of a mental condition falling into this kind of disease category, Haslam (2002) refers to depression. He also gives some examples of physical conditions which should be situated in the spectral kind disease category, namely obesity and high blood pressure (Haslam 2002, 206-207). High blood pressure does not

¹⁹ This is doubted by Peter Zachar (2002), who thereby questions the usefulness of Haslam's non-kind category in general. Although the right place of neuroticism in the approach of Haslam can be discussed (this is precisely what his approach is useful for), I nonetheless contend that there is an important difference between this "non-kind category" and the spectral kind category (to be discussed next).

²⁰ Haslam takes this as an argument for claiming that we are simply misguided if we are inclined to label any extreme traits that result from a normal distribution 'diseased'. I do not think that things are so straightforward though. In some cases, it might be clear what causes the extreme trait and what medical means can be used to 'treat' the undesired state, although it is for sure not always clear whether it is appropriate to see the state as a 'disease'. However, this does not form a problem as such. It is important to know that we are in a 'grey zone' for disease labelling when talking about states that fit in Haslam's 'non-kind' category and hence, that we should be very careful in the weighing of values and scientific knowledge in such cases.

²¹ Haslam uses the phrase 'practical kind' to refer to this category. As this phrase could cause confusion given my argument that the broader sense of 'disease' is itself practical, I alter his terminology in this discussion.

directly lead to disease symptoms (except when the pressure is extremely high), but nonetheless leads to heart and vascular diseases in the long run. An individual with a systolic blood pressure of 120 mm/Hg has a higher chance of having a myocardial infarction than an individual with a systolic blood pressure of 100 mm/Hg. The difference in chance is nonetheless not large. However, the probability of heart and vascular problems increases rapidly once one has a systolic blood pressure of 140 mm/Hg and higher. That is why a systolic blood pressure of 140 mm/Hg is taken as the threshold for diagnosing hypertension. A similar example is hypercholesterolemia. The rule here is: the lower, the better: the lower one's cholesterol level, the lower the chance that one will get a heart or vascular disease. However, medical practitioners look at the point where the risks start to raise rapidly. This is the case from 190 mg/dl. Hence, this is taken to be the threshold which justifies considering treatment. Although the diagnostic boundaries in the above examples are still debatable, there are reasons, based on evidence of increased risk of undesirable states occurring, and the potential to reduce these risks via treatment, for imposing them, and they are widely relied on in actual medical practice.

Haslam (2002) argues that, in those cases where one can discover real discontinuities, one should further discern three different kinds of 'discontinuous disease categories' of which only one can be understood in an essentialist manner. The first of these three kinds is the fuzzy kind class. Fuzzy kinds do not result from specific causal factors that are absent or present. A more complicated constellation of causal influences needs to be supposed to explain the intermediate ambiguous subset in the fuzzy kind category. Many of these causal constellations resulting in a fuzzy structure are developmental or dynamic. In any case, an essentialist causal model cannot explain the fuzzy structure of this kind of diseases. Haslam (2002) illustrates this kind with borderline personality disease. Arteriosclerosis is a possible example of a physical disease in the fuzzy kind category. As we age, the walls of our blood vessels thicken because of fat deposition and, later on, the hardening of these fat layers. In the long run, this causes the formation of blood clots and consequently myocardial infarctions, brain thrombosis, and ischaemia of limbs. Most children will be non-members of the disease category of arteriosclerosis, since arteriosclerosis hardly occurs among

children. Elderly persons with for example, a myocardial infarction or brain thrombosis are clear members. But in between these two groups are a very ambiguous group of individuals including those who only have a very mild form of arteriosclerosis, or suffer from more severe arteriosclerosis but nonetheless do not have clear symptoms because the flow of blood to their organs is still satisfactory.

The second kind of disease category with real discontinuities which is nonetheless not understandable in an essentialist manner, is what Haslam (2002) calls the 'discrete kind': "Simply put, a discrete kind is a category in which membership is dichotomous, the category boundary being objectively discoverable [...], but which is not grounded in a single defining or causally determining essential property" (Haslam 2002, 210). Haslam (2002) thinks melancholia (also called nuclear, endogenous, endogenomorphic, or melancholic depression) to be a good example of a disease falling in this kind of category. Research supports a taxonic understanding of melancholia, which explains the disease according to a threshold model: "According to this model, melancholia emerges as a quantitatively distinct form of depression when a threshold value on an underlying depression continuum is exceeded: at this point a distinct pathologic process is somehow triggered" (Haslam, 2002, 212). An example of a group of physical diseases falling into this category are autoimmune diseases. Diagnosing an autoimmune disease hence requires that many conditions are fulfilled. First, autoantibodies should be present. But given that a lot of healthy people have autoantibodies, this is not enough to diagnose autoimmune disease. One should demonstrate that the autoantibodies cause inflammation, that this inflammation is of a particular kind and that it affects particular organs that can explain the symptoms. Just having autoantibodies is hence clearly not the key feature of an autoimmune disease.

The last kind of disease category that Haslam distinguishes, is what he labels 'natural kind':

It is at least conceivable that a categorically distinct psychiatric syndrome might occur only when a specific, causally efficacious pathologic process, mechanism, or structure is present. For instance, if a particular genetic mutation were invariably and exclusively associated with a constellation of psychiatric symptoms and had a preponderant causal

role in their production, this mutation would seem to qualify as an essence in both the sortal and the causal senses (i.e., being a defining feature and causally responsible for the kind's observable properties). (Haslam 2002, 212)

As a mental disease that might possibly be viewed as a natural kind disease, Haslam (2002) refers to William's syndrome²². As Haslam argues, unambiguous examples of mental natural kind diseases are not easily found. They are more easily found in the domain of physical diseases. Infectious diseases seem to form a good example²³.

Haslam's disease categories nicely illustrate that the more complex the causal explanation for possible 'disease' states is, the more doubt might arise about the appropriateness of a disease label. This clarifies how we can evaluate the reasonableness of a 'disease' label for a specific undesired state by critically reflecting on the knowledge we have about explanatorily relevant causes, of the similarities and differences with other diseases of the same category and/ or diseases in the other categories, and of how relevant knowledge about undesirable sequelae of the causes plays a role in disease labelling. This will not lead to final decisions or final definitions, but will force us to critically think about the meaning of 'disease', and to be more thoughtful and consistent in our use of the notion in specific cases.

An example of how this can play out in practice in a specific case can be found in [blinded]. There I argue that we have currently good reasons to see ADHD as a spectral kind disease. This means that we should be careful in boldly speaking of ADHD in terms of a disease. When thinking about ADHD as a 'disease' from within the pragmatic framework, medical practitioners and experts might

²² William's syndrome is a rare genetic condition, which is characterized by a growth delay, a mild to moderate intellectual disability, distinctive facial features, unique personality characteristics and cardiovascular problems.

²³ Although this is debatable. See e.g. the paper of Rogers and Walker in this issue. Given my broader argument about the reasons that our general concept 'disease' is practical, it might seem that the sub-class of natural kind diseases could be perhaps be defined using a more traditional approach, insofar as such diseases seem to have a relatively clear descriptive basis and, typically, normative status. This may be true, but would elide investigation of the roles of these bases in disease designation. In any case, while an understanding of our concept 'disease' has practical and moral implications, I am not sure what would motivate an attempt to analyse this more specific concept.

become better aware of the differences with other, clearer cases of disease: that the characteristics of ADHD occur on a continuum, that it lacks any clear single cause, that a clear diagnostic threshold is missing, that there currently is a lot of scientific uncertainty concerning its etiology, and so on. This might result in a more nuanced view which will hopefully also be transmitted to the public and translated into practitioners' medical decisions. In turn, this could promote a more nuanced approach by parents and teachers which might, for instance, encourage more focus on methods other than medicine to control the conditions, and less stigmatization of the condition. It is of course wishful thinking that everyone will simply agree that ADHD is best seen as a spectral kind disease. But the framework at least offers a basis for a thorough discussion as a result of which the reasons for the disease label and the similarities and differences with other disease kinds can be further discussed in a constructive way. Importantly, the framework also leaves room for historical changes in our attitudes toward different health states. We do not yet have the causal explanations which allow us to label ADHD a discrete kind disease at this point in time, but this does not exclude the possibility of such knowledge becoming available in the future. If that would be the case, it would allow us to change our view on what kind of disease ADHD is.

5. Counterexamples and discrepancies in the pragmatic approach

In the previous section, I proposed an alternative, pragmatic framework which I am convinced shapes a more thoughtful and consistent approach to thinking about why we call certain conditions and not others a disease, about what kind of diseases we are confronted with in specific situations, about what this implies with respect to its characteristics and the strength of its disease status, etc. Within this pragmatic framework - unlike in the case of the traditional definitions resulting from traditional conceptual analysis - inconsistencies in our labelling of, and our dealing with, diseases should not necessarily result in a rejection of the disease status or of (part of) the framework. As discussed above, in the traditional approach, such inconsistencies arise as counterexamples to particular analyses of the concept 'disease'. Examples include homosexuality being confirmed as a disease in some cultures; welcome infertility not counting as a disease according to some

normativist accounts; having one's appendix removed being tantamount to being given a disease according to some accounts using a statistical abnormality criterion; and so on. The goal of the pragmatic approach is precisely to provide a framework which helps us to become aware of such inconsistencies, and to reflect further on whether we have convincing arguments to underpin them, or whether they rather point to a systematic shortcoming that should imply a change in our use of the disease notion or in the general framework. This means that on the pragmatic account, counterexamples can work in three ways: they are accepted as well-considered exceptions, or they indicate that we should revise our disease labelling practice, or they might induce a change to (a part) of our general framework. This is an important difference between the pragmatic framework and the univocal definitions aspired to in the traditional approaches: counterexamples might be acceptable, but should be argued for. On this approach then, we are encouraged to examine the reasons that homosexuality, welcome infertility, or lacking an appendix are diseases as well as our reasons for being hesitant about the designation, and to evaluate these reasons. Hence, counterexamples do not necessarily result in the rejection of the description or in an arbitrary revision of the concept, but aid reflection. The differentiative approach of the pragmatic framework further prompts a differentiative way to deal with different kinds of diseases, rather than to force everything in the same box or to make sharp dichotomies that are not in keeping with practice. It's true that this might not simplify matters, because it does not result in final, normative definitions and clearly delineated distinctions. However, this is motivated by the basic assumptions of the framework presented, namely that 'disease' is what we make of it, partly on the basis of clear evidence and arguments, partly on the basis of much less clear grounds; and, as I have argued, such a final definition does not seem really possible and/or useful. It is in keeping with the view that disease is a practical term, the conviction from which these basic assumptions arose. Given that the meaning of our practical concept 'disease' is not clear-cut, it is better to give a flexible analysis which fits the practice, than a stringent definition which does not.

6. Possible counterexamples and further worries.

Before coming to final conclusions, let me have a closer look at some possible counterexamples and counterarguments for my pragmatic view.

First, some people might worry about the fact that what is a 'desirable' state is highly contextual and subjective and that a single odd desire of a single individual might consequently be enough to upset my view in that it might make the odd desired state eligible to be called 'disease'. However, it should be clear that I do not talk about individual preferences here, but about a kind of desires that we almost generally agree upon. To clarify this distinction, it is useful to think of individual preferences as bidirectional (state 1 can reasonably be considered undesirable in view of state 2, [i.e. less desirable than state 1], but state 2 can also reasonably be considered undesirable in view of state 1). The preference for one or the other state will vary largely among individuals in the case of individual preferences. General preferences for certain desirable states are, on the other hand, desires for unidirectional changes with high concordance (cases in which we largely agree on the fact that state 1 is desirable in view of an undesirable state 2, or that state 2 is undesirable in view of state 1, but they cannot both be reasonably desirable). Let me give some examples to clarify this. Some people have small breasts, others have larger breasts. Some of the men and women with smaller breasts, desire to have larger breasts and the reverse. Are both 'having small breasts' and 'having large breasts' eligible for disease states? No, since it is clear that we conceive it reasonable that people's desires about this vary and hence that this concerns individual preferences. Compare this to the fact that some people have breast cancer and others have not. In this case we generally agree upon the fact that not having breast cancer is the desired state. Arguments for the reverse will not easily be accepted by the general public. It is nonetheless clear that we can apply our medical know-how to fulfill individual preferences, as is often the case with plastic surgery. Such a use of medical know-how is, however, not the result of a central concern of medicine and does not imply that we have to do with a 'disease'.

A related counterexample that has often been used in the literature is the case of unwanted pregnancy. Cooper (2002) argues that unwanted pregnancy can be a disease on the basis of her analysis of the 'disease' concept. I think her approach forces her to conflate individual preferences

with general ones. Being pregnant is not generally conceived of as an undesirable physical condition. Even a person who became unintentionally pregnant and does not want to be in that situation, might be supposed to agree that being pregnant is not an undesirable physical condition as such. Not being able to become pregnant when sexually active at a fertile age is a physical condition for woman that is, on the contrary, eligible for being labeled a 'disease', since we generally agree that this is an undesirable situation. However, this stands apart from how specific individuals think about it when they are in that situation (hence, whether or not they also want to be(come) pregnant).

Some people are also very happy to learn to live with their 'disease' without medical interventions. This is for example the case for the part of the deaf community that does not support cochlear implants. That most people think we have good reasons to label some state 'disease', does not necessarily imply that medical science should always intervene. Further, if a society at a certain point in time agrees upon the fact that it is not straightforward to consider a certain state as eligible for being a 'disease' state, this might form a reason for no longer viewing certain groups of people as 'diseased', even though the condition might have a clear causal basis. This would be the case for deaf people if everyone agreed that deafness is not problematic and harmful, but only results in another way of living. This example nicely illustrates how the attribution of diverging evaluations to the same neutral physical facts can result in different ideas about the appropriateness of the disease label, and how this might lead to changes over time.

Lastly, some states, such as teething (also a popular example in the concept of disease debate), cause suffering and seem therefore eligible for being a 'disease' state. The causes for the suffering are also clear in this case and can be medically treated by removing the teeth. It is clear that we will not do this. That is why I added the condition that the desirability of a medical intervention should be supported by our scientific knowledge. For this reason, teething cannot be stated to be a 'disease', since we know it is useful to get teeth, although this might result in pain. It also implies that medical practitioners will not intervene on the level of the cause, but they might nevertheless consider to use the medical know-how to conquer the symptoms of teething (such as pain). The

latter shows again that biological and biomedical knowledge can be used more broadly than only for the prevention and treatment of diseases. That a medical intervention can improve a certain disvalued state, hence does not necessarily imply that it concerns a 'disease' state.

In general, one can rightly accuse me of giving a very vague approach, that should be further refined and fleshed out. Additionally, it is a justifiable concern whether I have not just traded one intractable debate for another (e.g. by not giving directions on how one can choose between the three possible ways of handling counterexamples within this pragmatic framework, cf. section 5)²⁴. On the one hand, I agree that this is just a beginning, a first step in what I hope to be the good direction for a more fruitful debate on the concept of disease. On the other hand, I want to emphasize again that the goal of this approach is not to come to fixed and final conclusions about what a disease is, and on how to conclude whether or not specific states can *really* count as disease. On the contrary, the conclusion should be that generally applicable and precise descriptions and directions on these points are impossible, and that we should therefore find good ways to make explicit why things are not straightforward and how we can deal with it.

7. Conclusion

In this paper, I argued that we should reconsider the debate on the concept of disease and think about how to achieve a more fruitful view that forms a better basis for reflection than the traditional accounts. I argued that we should stop performing conceptual analyses in the traditional way. We better opt for an alternative which no longer presupposes that we can start from scratch in performing conceptual analyses and that a single, univocal (descriptive or revisionist) definition should be found.

The alternative, pragmatic approach that I defended in this paper does not lead to another, final definition. It rather aims to provide a description which is more closely tied to the way we build, use and apply the concept 'disease'. The approach is based on how the notion is already used in

²⁴ I thank the anonymous referees of this journal for pointing me towards these possible counterarguments.

practice, but does not uncritically adopt this. It aims to be guiding and illuminating (by providing a theoretical framework to rely on), but not determining (by forcing one in the first place to reflection and not to black-or-white-decisions). My discussion has proposed that our use of the term 'disease' is determined by the interaction of value-laden considerations about, and discoveries of the causes of, particular states, and explored some of the ways these interactions can lead us to either applying or withholding disease labels, and how different interactions in these regards result in different kinds of disease categories. I do not want to claim that the approach as presented is final and able to end the debate about the concept of disease. My main goal was to propose an alternative framework that can show how the debate might evolve in a more promising way. I hope that it makes readers rethink the way we traditionally debate about the concept of 'disease' and helps in leading us to a more fruitful discussion.

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