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The Disunity of Disease

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Abstract

In a recent paper, Harriet Fagerberg argues that the disease debate in the philosophy of medicine makes little sense as conceptual analysis but instead should proceed on the assumption that disease is a real kind. I propose an alternative view. The history and practice of medicine give us reasons to doubt that the category of disease forms a real kind. Instead, drawing on work by Quill R. Kukla, I argue that the disease debate makes good sense on an understanding of disease as an institutional kind. As well as explaining key features of the disease debate, this can facilitate a philosophical understanding of disease that captures the eclectic scope of medicine and the complex reasons why conditions get classified as diseases.

1. Introduction

1.1 The Disease Debate

The disease debate in the philosophy of medicine concerns the question of what makes something a disease rather than a healthy state. Historically, this has been framed as a debate between: (1) naturalism—the view that disease is determined by biological facts (Boorse 1977); (2) normativism—the view that disease is determined by evaluative judgments (Cooper 2002; Culver and Gert 1982; Engelhardt 1976; Fulford 1989; Nordenfelt 1987; Reznek 1987); and (3) hybridism—the view that disease is determined by facts and values (Wakefield 1992).

What sort of project are these philosophers undertaking? Commonly, they consider themselves to be engaging in conceptual analysis, where the aim is to reach a set of definitional criteria that capture our uses of the term "disease." In "What We Argue About When We Argue About Disease" Harriet Fagerberg (2023) suggests otherwise. She argues that participants in the disease debate are not arguing as if they are engaging in conceptual analysis. Instead, she contends that the disease debate makes better sense under the assumption that disease is a real kind.[1] Under this view, key features of the disease debate

[1] Philosophers commonly use the expression "natural kind" to refer to a category of instances that share common properties which can support inductive inferences, but Fagerberg uses "real kind." In this paper, I am using "real kind" to accord with Fagerberg's usage.

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can be explained if its participants are taken to be referring to a unified class of conditions that share common biological properties.

In this paper, I offer an alternative view, which consists of: (1) the negative thesis that disease is unlikely to form a real kind; and (2) the positive thesis that the disease debate can be explained by the understanding that disease is an institutional kind. After clarifying Fagerberg's view in greater detail in the rest of this section, the paper proceeds as follows: In section 2, I argue that the history and practice of medicine give us reasons to doubt that disease forms a unified real kind. Hence, the claim that disease is a real kind is a precarious explanation for the disease debate. In section 3, with reference to recent work by Quill R. Kukla (2014, 2022), I present the view that disease is an institutional kind. I argue that this view can make better sense of the disease debate. In section 4, I address two further points of contention.

Before I proceed, some clarification is required. When I say that disease is not a real kind, I am talking about the general category of disease. I do not dispute that some specific types of diseases are real kinds. For example, polycystic kidney disease is plausibly a real kind, because instances of polycystic kidney disease share a cluster of biological properties that can support inductive inferences. I also do not dispute that some classes of diseases may form real kinds.[2] For example, spongiform encephalopathies plausibly form a real kind, as the conditions in this category share a common cluster of mechanisms. Rather, I am saying that the general category of disease is not a unified real kind.

1.2 From Conceptual Analysis to Descriptive Analysis

As noted above, philosophers who participate in the disease debate generally consider themselves to be engaging in conceptual analysis. Hence, Fagerberg notes:

> Traditionally, it has been billed as a debate about the correct conceptual analysis of disease, with the aim of settling on a set of descriptive criteria, stated in terms of necessary and sufficient conditions, which are associated with the label "disease," and guide its usage in language. Definitions are proposed, counterexamples are concocted, alternative definitions proposed, and on it goes. (Fagerberg 2023, 1)

However, Fagerberg contends that the participants in the disease debate do not typically argue as if they are engaged in conceptual analysis. She notes that the participants often show disregard for the linguistic community of interest and for how terms are applied.

Regarding disregard for the linguistic community of interest, Fagerberg criticizes Jerome C. Wakefield (1992) for claiming to provide a conceptual analysis of disorder as it is used in clinical medicine but then covertly invoking an ordinary language concept of disorder to oppose how the term is used in clinical medicine in cases that he judges to involve medical overreach. Apropos disregard for how terms are applied, Fagerberg criticizes Rachel Cooper (2002) for suggesting that unwanted pregnancy could count as a disease under her account, even though the term "disease" is not commonly applied to it. The issue here is that conceptual analysis is supposed to be a conservative activity that aims

[2] Plausibly, there are also types and classes of diseases that do not form biological kinds but may form psychological kinds or social kinds. For example, some psychiatric diagnoses may have instances that are not unified by biological properties but are unified by their psychological and interpersonal features (Maung 2023).

to describe how a term is applied by a linguistic community, whereas the participants of the disease debate seem to be proposing revisionist accounts that stipulate how the term should be used.

Given the above, Fagerberg argues that the disease debate makes little sense as conceptual analysis. She claims instead that the disease debate makes more sense on the assumption that disease is a real kind. Hence, she suggests that the philosophical study of disease should proceed on the assumption that disease is a real kind. This marks a shift in philosophical methodology from *conceptual* analysis to what Sally Haslanger (2005) calls *descriptive* analysis. Whereas the aim of conceptual analysis is to elucidate what the members of the linguistic community mean when they apply a term, the aim of descriptive analysis is to elucidate the empirical features that characterize the class of things in the world to which the term refers. Such a descriptive analysis may involve questions such as "what are the properties that instances of pathology share in common?" and "what is the underlying causal structure that accounts for the clustering of these properties in nature?" (Fagerberg 2023, 17).

Following Richard Boyd (1999) and Ruth G. Millikan (2000), Fagerberg takes real kinds to be "categories of instances that share a great many properties in common" (Fagerberg 2023, 13). Specifically, she endorses a homeostatic property cluster account, according to which instances of a real kind possess a cluster of properties that tend to occur together because they reinforce one another through causal processes. Because these properties tend to occur together across instances, they can support inductive inferences. Importantly, Fagerberg is not merely suggesting that some specific types of diseases are real kinds—which I do not dispute—but is suggesting that disease itself as a class is a real kind: "My view is that disease is a real or natural kind, individual disease kinds are natural kinds, and these two facts are not unrelated" (2023, 14).

Hence, the claim that disease is a real kind amounts to the claim that pathological conditions, or instances of disease, form a unified category in virtue of their sharing a common cluster of causally related properties.

According to Fagerberg, the assumption that disease is a real kind can make sense of certain features of the disease debate. First, she suggests that it can explain why, despite their disagreements, participants insist they are talking about the same thing when they argue about disease. While there may be no single agreed pattern of usage, Fagerberg suggests that the participants are talking about the same thing because their expressions have the same referent. Second, she suggests that the assumption that disease is a real kind can accommodate the revisionist inclinations of the participants in the debate. While such revisionist inclinations are incompatible with the conservative aims of conceptual analysis, they are compatible with the assumption that disease is a real kind, because empirical facts about the kind can inform us about which applications of the corresponding term are and are not appropriate. Thus, Fagerberg contends that "if pathology is a real kind, we can make good sense of principled revisionism as regards the concept's proper application" (Fagerberg 2023, 16).

I think that Fagerberg is right to be skeptical about the role of traditional conceptual analysis in the disease debate. I also agree that a descriptive analysis can contribute to understanding and resolving the disease debate. However, I argue that her specific hypothesis is precarious. As I argue below, descriptive analyses of instances of disease and the historical processes through which conditions become classified as diseases give us

reasons to doubt that disease forms a unified real kind. Thus, I contend that the disease debate is better explained by an account that does not posit the presence of a real kind.

2. Why Disease May Not Form a Real Kind

2.1 The Diversity of Disease

The assumption that disease is a real kind is challenged by the eclectic scope of medicine. Open any medical textbook and you will see the diverse assortment of conditions that are considered diseases. The contents of *Davidson's Principles and Practice of Medicine* include the subcategories of critical illness, poisoning, cancer, metabolic disease, infectious disease, urinary tract disease, cardiovascular disease, respiratory disease, endocrine disease, alimentary tract and pancreatic disease, liver and biliary tract disease, blood disease, rheumatological disease, neurological disease and stroke, and skin disease, among others (Walker et al. 2014). The list becomes even more diverse when medical subspecialties are considered. For example, the *Illustrated Textbook of Paediatrics* includes disorders of motor, linguistic, and intellectual development, as well as congenital metabolic conditions (Lissauer and Carroll 2018). The textbook *Obstetrics and Gynaecology* includes infertility, menstrual cycle disorders, problems in pregnancy, and complications in delivery (Impey and Child 2017). We can also add to these the psychological and behavioral conditions included in the *Shorter Oxford Textbook of Psychiatry* (Cowen, Harrison, and Burns 2012), as well as the various sorts of trauma, injuries, and anatomical anomalies included in *Adams's Outline of Orthopaedics* (Hamblen and Simpson 2010).[3]

Of course, as Robert D'Amico (1995) argues in response to Lawrie Reznek (1987), diversity at a superficial level does not preclude unity at a deeper level. Indeed, several of the above conditions are causally related at a deeper level. Cardiovascular disease and strokes share the common mechanism of atherosclerosis. Endocrine diseases, such as diabetes mellitus and hyperadrenalism, have systemic effects that increase the risks of cardiovascular disease and neurological disease. Some rheumatological diseases, such as rheumatoid arthritis and systemic lupus erythematosus, involve immunological mechanisms that can increase the risks of hematological conditions, such as hypercoagulation and thrombosis. Thus, it is plausible that at least some groups of diseases are related via an assortment of causal mechanisms.

However, a great many diseases are not causally related in this manner at a deeper level. For example, osteogenesis imperfecta, enterobiasis, pancreatic cancer, ectopic pregnancy, alopecia areata, seasonal rhinitis, and agoraphobia all involve radically different etiologies, mechanisms, manifestations, courses, treatments, and outcomes. There is no evidence of a deeper causal structure or a robust set of common mechanisms relating these conditions. At most, there may be some general bodily processes that occur across some of these conditions, such as inflammation and cytokine release, but these are nonspecific processes that are also involved in many healthy states (De Baat et al. 2023; Medzhitov 2021; Rankin

[3] On a methodological note, the purpose of appealing to medical textbooks here is not to undertake a conceptual analysis. The focus is not on how the term "disease" is used in these textbooks. Rather, the textbooks are being used as sources of empirical knowledge about the variety of conditions that are treated by medicine as diseases, and so are supporting a descriptive analysis of the empirical features of different diseases. If one wants to forgo the textbooks, one could instead go into the world to study actual cases of these conditions, but textbooks provide a comprehensive compilation of this empirical knowledge.

and Artis 2018). Furthermore, some conditions, such as alopecia areata, seasonal rhinitis, and agoraphobia, while associated with distressing symptoms, often do not have further biological sequelae that disrupt other bodily systems; hence, they cannot straightforwardly be unified by an account of disease, such as Fagerberg's domino theory of disease (2025), which requires diseases to have further effects on other bodily systems.

Some diseases even involve opposite biological mechanisms. For example, certain forms of cancer are marked by cellular growth and resistance to cellular death, whereas certain forms of dementia are marked by precipitous cellular death, which partly explains the inverse correlation between the incidences of these conditions in the population (Zabłocka et al. 2021). It might be contended that these conditions are still unified by a common feature, which is that they involve deviations from what might be considered "normal" cellular activity, albeit in opposite directions. However, I argue that it is doubtful whether deviation from a norm is the sort of thing that can be a real kind. I expand more on this in section 2.3 in my discussion of dysfunction, but the basic idea is that there are a vast assortment of ways in which bodily processes can deviate from a given norm, and so such deviations are not united by any "first order physical properties" (Thornton 2000, 70) but are only brought together by their atypicality relative to this norm.

The conditions mentioned above are not edge cases but standard examples of diseases. Yet, the image they present is not one of a unified biological kind but one of disunity. Osteogenesis imperfecta, ectopic pregnancy, alopecia areata, and agoraphobia are so radically different from one another that they do not share a common causal structure or cluster of mechanisms. Some of these conditions, such as alopecia areata and agoraphobia, often do not even have biological effects on other bodily systems. In view of the vast diversity of etiologies and mechanisms associated with the above conditions, the basis for bringing them all under the category of disease is not that they share a common cluster of biological properties. Of course, Fagerberg might have responses to some of the concerns raised here—although as noted above, her recent domino theory of disease does not straightforwardly accommodate those diseases that do not typically have causal sequelae on other bodily systems. Hence, the problems raised by the diversity of disease give us good prima facie reasons to consider an alternative view, which is that disease may not form a unified real kind.

2.2 Pathologization and Depathologization

We can also challenge the assumption that disease is a real kind by examining the processes through which various conditions have been pathologized or depathologized. Pathologization refers to the process by which a condition comes to be considered a disease, whereas depathologization refers to the process by which a condition that was previously considered a disease is no longer considered a disease.[4] As we shall see, the reasons underpinning pathologization and depathologization often have little, if anything, to do with whether the conditions fall under a real kind. This supports a debunking argument,

[4] The concept of "pathologization" is closely related to Peter Conrad's (1992) concept of "medicalization," but there is some difference. Whereas "medicalization" refers to the process by which a condition is brought under the purview of medicine, "pathologization" refers more specifically to the process by which a condition comes to be considered a disease. For example, menopause is a condition that has been medicalized but not pathologized, insofar as it is often managed by the medical profession but is not considered a disease.

whereby the irrelevance of real kindhood to the processes by which conditions get classified as diseases undermines the likelihood that disease forms a real kind.

What considerations inform pathologization and depathologization? Let us begin with the example of the recent pathologization of obesity. In 2008, the Obesity Society published a white paper addressing the issue of whether obesity should be classified as a disease (Allison et al. 2008). Some of the cited experts appealed to empirical details about the biological mechanisms of obesity. For example, George Bray (2004) notes that obesity involves cellular mechanisms that increase the risks of diabetes mellitus and cardiovascular disease. By contrast, Angelo Tremblay and Éric Doucet (2000) suggest that obesity involves mechanisms that have roles in maintaining healthy homeostasis. However, these biological details were not what determined obesity's status as a disease. Instead, the Obesity Society proposed a utilitarian approach to the issue, whereby "conditions that produce adverse health outcomes come to be considered diseases as the result of a social process when it is assessed to be beneficial to the greater good that they be so judged" (Allison et al. 2008, 1169). Relevant considerations included the implications of pathologization for public welfare, stigmatization, treatment programs, insurance reimbursement, consumer protection, and medical education. Therefore, the classification of obesity as a disease was not determined by whether obesity falls under a real kind but was "a social, political, and fundamentally ethical and moral question" (2008, 1162). It is also worth noting that the debate has continued, as the pathologization of obesity has been criticized for reinforcing rather than mitigating the unjust oppression of people of higher weight (Lupton 2012). Accordingly, Margaret Steele and Francis Finucane (2023) argue that the medical discourse about obesity needs greater conceptual clarity to focus on the social causes and metabolic implications of obesity, instead of further reinforcing the stigmatization of body size.

Infertility is another example of a condition that was pathologized relatively recently. The pathologization of infertility took place in the context of developing assisted reproductive technologies (Griel 1991). The reason given for classifying infertility as a disease was the sanctioning of access to these assisted reproductive technologies, as Vardit Ravistky and Raphaelle Dupras-Leduc note:

> The implications of the question are clear: if perceived as a disease, public funding for its treatment is construed as justified and what remains to be determined is its prioritization in relation to other required treatments competing for limited resources … if not, funding it may not be justified from the outset. (2014, 225–226)

Here, the relevant consideration underpinning infertility's disease status was not whether it falls under a real kind but priority setting for the funding and provision of fertility treatment (Kukla 2022). As Fagerberg (2025) notes, it is also interesting that *unwanted* infertility is typically considered a disease whereas *wanted* infertility, such as through contraception use, is not. I contend that this further undermines the real kind approach to disease, for here the difference between disease and non-disease is not the underlying biological state but a value judgment about whether the biological state is unwanted or wanted.[5]

[5] Moreover, Fagerberg (2025) notes that unwanted infertility presents a challenge to her domino theory of disease because it is considered a disease even though it often does not involve the sort of dysfunction that has further causal sequelae on other bodily systems.

While obesity and infertility present examples of pathologization, the removal of homosexuality from the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) presents a famous example of depathologization. This took place in the context of movements and demonstrations to promote the rights of gay people in society. These protests led to a series of meetings with the American Psychiatric Association, where John Fryer, a gay psychiatrist, attended in disguise under the pseudonym "Dr. H. Anonymous" and spoke about the injustices suffered by gay people (McHenry 2022). Subsequently, homosexuality was excluded from DSM-III (APA 1980). And so, the declassification of homosexuality as a disease did not have anything to do with whether homosexuality falls under a real kind but was informed by the rights of gay people and the harms of pathologization for the gay community.

Gender incongruence is presently undergoing a similar process of depathologization, although the process has been slower and less complete. Formerly, gender incongruence was classified as "transsexualism" in the *International Classification of Diseases* (ICD-10) (WHO 1992) and DSM-III (APA 1980) and as "gender identity disorder" in DSM-IV (APA 1994). Prior to the release of DSM-5 (APA 2013a), the DSM-5's Sexual and Gender Identity Disorders Workgroup recommended the retention of gender dysphoria as a psychiatric disorder (Zucker 2015). This judgment has been criticized by proponents of trans depathologization, who argue that depathologization is important for recognizing trans people's rights to have their identities accepted as legitimate (Davy 2015; Suess Schwend 2020; Teren 2024). After consulting various professional organizations and civil societies, the ICD-11's Working Group on the Classification of Sexual Disorders and Sexual Health supported the depathologization of gender incongruence on the grounds that medicine should be "more responsive to the needs, experience, and human rights" of trans people and "more supportive of the provision of accessible and high-quality healthcare services" (Drescher, Cohen-Kettenis, and Winter 2012, 575). Accordingly, the World Health Organization depathologized gender incongruence in 2019, so that ICD-11 no longer includes gender incongruence as a disease. However, DSM-5 still includes the diagnostic category of gender dysphoria and this decision was partly motivated by the aim of facilitating access to insurance coverage (APA 2013a; 2013b). Again, the reasons for depathologizing gender incongruence had little to do with whether gender incongruence falls under a real kind. Rather, the process was influenced by important ethical and social values, including an appreciation of gender diversity, respect for trans people's identities, and the provision of gender-affirming care.

Autism and intersex are examples of conditions that are presently the foci of depathologization movements. There are interesting parallels between the two cases. For example, Robert Chapman (2023) argues that the pathologization of autism was informed by a socially constructed conception of "normal" behavior that was shaped by the demands of intensified capitalism. Similarly, Melanie Newbould (2012) notes that the pathologization of intersex was informed by social norms regarding the characteristics of "normal" gendered bodies. The proposal to depathologize autism is associated with the neurodiversity movement, which views autism as a legitimate manifestation of behavioral diversity, rather than as a medical disorder. Again, the point of contention here is not whether autism falls under a real kind but the harms of pathologization, such as disempowerment and exclusion. Likewise, the proposal to depathologize intersex is informed by considerations such as stigmatization and the severe harms of "normalization"

surgeries performed on intersex infants without their consent. Hence, there has been a call to remove "disorders of sex development" from ICD-11 and instead use "congenital variations of sex characteristics" or "differences of sex development" to indicate that intersex is not a disorder (Carpenter 2018).

The above cases show that the reasons underpinning pathologization and depathologization are often pragmatic and ethical, rather than metaphysical. That is to say, the inclusion and exclusion of these conditions from the category of disease are not determined by whether these conditions fall under a real kind but by practical needs and social challenges. This supports a debunking argument against the claim that disease is a real kind. The processes by which conditions get classified as diseases do not track real kindhood but instead track various other considerations, and so it would be unlikely for these conditions to form a real kind. While this does not necessarily preclude the possibility that the conditions that get pathologized could turn out to form a real kind, it does suggest that such a possibility would be somewhat miraculous. Given that conditions are classified as diseases through processes that do not track real kindhood, there is no reliable connection between their being classified as diseases and their falling under a real kind.

2.3 A Pessimistic Induction

Although diseases may presently appear diverse, the proponent of the real kind approach to the disease debate could suggest that there may be unifying properties that have not yet been discovered or specified but will be in the future. However, this promissory optimism is confounded by previous unsuccessful attempts to specify unifying properties of disease. The resulting argument takes the form of a pessimistic induction that is roughly analogous to Larry Laudan's (1981) confutation of scientific realism.

Historical attempts to formulate unified theories of disease are summarized by the historian Charles Rosenberg:

> For a physician in the late eighteenth and early nineteenth centuries, as we have suggested, neohumoral models were particularly important—and used to rationalize such therapeutic measures as bleeding, purging, and the lavish use of diuretics. With the emergence of pathological anatomy in the early nineteenth century, hypothetical frameworks for disease were increasingly fashioned in terms of specific lesions or characteristic functional changes that would, if not modified, produce lesions over time. (1981, 7)

The neohumoral theory has long been scientifically discredited, while the lesion theory was shown to be inadequate. Many diseases, including most psychiatric disorders and chronic pain conditions, such as fibromyalgia, are not associated with structural lesions.

From the late nineteenth century, germ theory gained prominence and there was a hope that all diseases could be attributed to infections by microorganisms:

> It seemed that it would be only a matter of time before physicians understood all those mysterious ills that had puzzled their professional predecessors for millennia; the relevant pathogenic microorganisms need only be found and their physiological or biochemical effects understood. This was an era, as is well known, in which

> energetic—and sometimes overly credulous or ambitious—physicians "discovered" microorganisms responsible for almost every ill known to humankind. (Rosenberg 1981, 7–8)

Germ theory successfully accounts for infectious diseases and could potentially support the claim that this class of diseases form a real kind. However, a great many diseases are not caused by infectious microorganisms, and so germ theory cannot support the claim that the general category of disease is a real kind.

More recently, there has been interest in inflammation as a common disease process. Inflammation is recognized as a key part of the body's response to cellular injury and has been implicated in "a wide variety of mental and physical health problems that dominate present-day morbidity and mortality worldwide" (Furman et al. 2019, 1822). Accordingly, it has been suggested that inflammation could be general feature of disease. However, inflammation is a nonspecific feature that is also crucially involved in a vast range of healthy states and processes (De Baat et al. 2023; Medzhitov 2021; Rankin and Artis 2018). These include metabolism, growth, thermogenesis, tissue remodeling, neuronal activity, menstruation, and pregnancy. As noted by the immunologist Ruslan Medzhitov (2021), this confutes the traditional assumption that inflammation is a marker of pathology. Given that inflammation is not specific to disease, but is crucial to physiological and cellular processes more generally, it cannot form the basis for a kind that includes only diseases and excludes healthy states.

Within the philosophy of medicine, attempts to naturalize disease have appealed to the concepts of function and dysfunction. In his biostatistical theory, Christopher Boorse (1977) uses a teleological account of function, whereby the function of a part of an organism is the contribution of that part to the organism's goals of survival and reproduction. By contrast, Wakefield's (1992) harmful dysfunction analysis uses a selected effect account of function, whereby the function of a mechanism in an organism is whatever that mechanism did in the organism's ancestors that was conducive to their survival and reproduction, and so explains the inheritance of that mechanism across generations to the present organism (Millikan 1989; Neander 1991). The selected effect account of function is also endorsed by Fagerberg in her domino theory of disease, according to which "diseases are biological dysfunctions which either cause other traits of the organism's body to become somatically mismatched, or which cause them to become dysfunctional, or both" (Fagerberg 2025, 406).

The biostatistical theory and the harmful dysfunction analysis have been beset by several problems and counterexamples (Bolton 2001; Cooper 2002; Fulford 1989; Kingma 2007; Lilienfeld and Marino 1995; Varga 2011). In a recent paper, I argue that claims about function and dysfunction are especially problematic for psychiatric disorders, because we lack the methodological tools to demonstrate whether many of the relevant psychological features are functional, dysfunctional, mismatched, or adaptively neutral according to a selected effect account of function (Maung 2024).

The domino theory of disease is also confounded by counterexamples, such as the cases of alopecia areata, seasonal rhinitis, and agoraphobia discussed in section 2.1, which usually do not have biological sequelae that cause dysfunctions in other bodily systems. If the theory were expanded to include these conditions, it would also have to include the localized loss of function in contraceptive use. Furthermore, other diseases have causal sequelae that are neither dysfunctional nor mismatched but are functional under a selected effect account of

function. These include the inflammatory and immunological responses to transient and localized infections, such as acute rhinitis, enterobiasis, and dermatophytosis. Such inflammatory and immunological effects can be associated with unpleasant symptoms, but they are nonetheless functional under a selected effect account of function, and so the above transient and localized infections are not straightforwardly accommodated by the domino theory. Another counterexample to the domino theory, which relates to the discussion of gender incongruence in section 2.2, is the procedure of orchiectomy in gender-affirming surgery. According to a selected effect account of function, this would involve a dysfunction, as it stops spermatogenesis and androgen production. It may also meet the domino theory's criteria, for the resulting hypoandrogenism has further biological effects on other bodily systems. However, for a trans woman who has chosen to have gender-affirming surgery, such a state would not be a disease at all, but would be a healthy and, indeed, desirable state. In this context, a selected effect account of function seems inappropriate for judgments about health and disease.

In addition to the above problems, there is also a more general doubt about whether dysfunction is the sort of category that can form a unified real kind. Some philosophers have argued that functions cannot be assigned without appealing to explanatory interests and values, thus suggesting that functions—and thus dysfunctions—do not constitute a wholly natural grouping (Amundson 2000; Hardcastle 2002; Ratcliffe 2000). This is further compounded by the vast diversity of functions and dysfunctions. Bodily parts are highly diverse with regard to their developmental origins, evolutionary histories, structures, components, mechanisms, and effects. Moreover, the things that can happen to these parts that make them fail to produce their adaptive effects are also various. Hence, functions are disparate, but dysfunctions are even more disparate. Given the immense range of biochemical, physiological, and behavioral states and processes that could qualify as dysfunctions, it is doubtful whether dysfunction as a category can be considered a unified kind. As Tim Thornton notes: "What unites natural kinds such as gold or water are first order physical properties. No first order physical properties unite natural functions" (2000, 70). Rather, the assortment of features we classify as dysfunctions are brought together only by their deviations from expected adaptive effects, not by any common causal structures or mechanisms. Different sorts of dysfunctions do not seem to form a unified kind any more than different sorts of brokenness.

Given that past attempts to specify a real kind that corresponds to disease have been unsuccessful, a pessimistic induction would conclude that future attempts to specify a real kind that corresponds to disease will also be unsuccessful. It must be conceded that the pessimistic induction is a contentious argument and its use against scientific realism has been widely criticized (Mizrahi 2013; Park 2019). Accordingly, I do not take the above pessimistic induction against the real kind approach to the disease debate to be conclusive on its own. Nonetheless, when considered alongside the diversity of conditions classified as diseases and the sorts of contingent considerations that inform the inclusion or exclusion of conditions as diseases, the pessimistic induction is plausible. In view of such diversity and contingency, it is unsurprising that past attempts to specify a unified real kind have been unsuccessful and there is no good reason to suppose that future attempts will be any more successful.

2.4 Implications

Above, I have given reasons why disease does not form a real kind. First, the assortment of conditions that are treated by medicine as diseases are causally and mechanistically diverse. Second, healthcare organizations state that the decisions to classify certain conditions as diseases are often informed by pragmatic and ethical considerations, such as priority setting, public welfare, and resource mobilization. Third, previous attempts to specify a real kind that unifies all instances of disease have not been entirely successful.

Real kinds are supposed to be epistemically useful because they can support robust inductive inferences. Indeed, medicine does make robust inductive inferences that inform predictions and interventions. As noted in section 1.1, I accept that these inductive inferences are supported by at least some types or classes of diseases forming real kinds. For example, the fact that bacterial infections form a real kind can support inferences about the likely immunological mechanisms and the probable effectiveness of antibiotic treatment. However, while specific types or classes of diseases may support inductive inferences, the general category of disease fails to meet this criterion. Given how biologically diverse diseases are, the knowledge that a condition is a disease does not allow us to make robust inductive inferences about the condition's etiology, mechanisms, manifestation, treatment, or likely outcome. Rather, insofar as there are inferences that can be made from a condition's disease status, these inferences are about social and normative values, attitudes, and practices. For example, the knowledge that the condition is a disease, rather than a mere difference, tells us that the condition is generally disvalued, usually causes harm or distress, and is considered appropriate to manage with the institutional tools of medicine.

Importantly, this is not to the detriment of medicine. The success of medicine does not depend on disease being a real kind. Medicine is not merely interested in the theoretical classification of bodily conditions but has ethical, social, and practical interests, which include the alleviation of suffering, the setting of social priorities, and the promotion of well-being. It may be that the category that best serves these diverse interests does not form a unified real kind but instead is eclectic enough to accommodate a wide range of conditions associated with bodily suffering and impaired well-being. As Kukla notes: "Scientific unity and clinical unity may not co-travel" (2022, 133). Moreover, the therapeutic tools of medicine are diverse and act through different mechanisms. Consider the vastly different ways the body is affected by surgical interventions, antibiotic treatment, antihypertensive medications, chemotherapy, hormone replacement, neuroleptic medications, vaccinations, psychotherapy, and dietary interventions. Given the diversity of its technical resources, medicine has the capacity to manage an eclectic range of conditions that do not have to form a unified real kind. Indeed, as philosophers of science have noted, many scientific concepts are marked by disunity. For example, C. Kenneth Waters (2017) notes that scientific concepts often lack a "general structure" because many features of the world that are relevant to our interests are not orderly, while Harold Kincaid (2008) uses the example of oncology to show that cancer does not have to form a unified real kind for scientific research and clinical practice to be successful.

Because disease is unlikely to form a real kind, the claim that disease is a real kind is a precarious explanation of the key features of the disease debate. In what is to follow, I present an alternative explanation. I suggest that disease can be understood as an institutional kind, whose instances are bound together by a cluster of institutional resources, practices, and attitudes. After further clarifying the notion of an institutional kind

in section3.1, I argue in sections 3.2, 3.3, and 3.4 that the institutional approach makes better sense of the disease debate. I also suggest in section 3.3 that this approach can help us go beyond explaining the disease debate to resolving it.

3. Making Sense of the Disease Debate

3.1 Disease as an Institutional Kind

In "Medicalization, 'Normal Function', and the Definition of Health" (2014) and "What Counts as a Disease, and Why Does It Matter?" (2022), Kukla argues that disease is an institutional kind. An institutional kind is a category that is constitutively dependent on and embedded in a social institution or set of institutions, such that inclusion in or exclusion from the category is contingent on the activities of the relevant institution or set of institutions: "For something to be a disease is for it to be embedded within and taken up by the relevant social institutions as being one" (Kukla 2014, 518).[6]

By being classified as diseases, conditions are brought within the purview of the resources, practices, and attitudes of the institutions of healthcare. As shown by the examples of pathologization in section 2.2, the specific reasons for classifying such conditions as diseases may be informed by various pragmatic, ethical, and social values and interests, including the benefits to stakeholders of mobilizing these institutional resources and practices. Hence, the institutional account of disease is a normativist account, insofar as it recognizes that disease status is ultimately informed by a complex array of values (Knox 2023). What unifies instances of disease is not a shared set of biological properties but the manner in which they are entwined with the institutional resources, practices, and attitudes of healthcare.[7]

The things that are classified as instances of an institutional kind may be real things in the world, but the category under which they are classified is constitutively dependent on the relevant institution or set of institutions. Hence, for something to be an instance of an institutional kind is for it to be embedded in the relevant institution or set of institutions in the appropriate way. For example, crime is a category that is constitutively dependent on the institutions of law. While a specific act, such as the act of intentionally injuring another person, is a real event in the world, the status of this act as a crime is constitutively dependent on the institutions of law. Likewise, Kukla writes:

> While diseases are fully real, the category of disease is constitutively dependent upon and embedded within a social institution. I have argued that we can only understand what counts as a disease by looking at what it is strategic to medicalize, and this constitutively indexes the concept of disease to medical institutions. (2022, 143)

[6] Further to the general thesis that disease is an institutional kind, Kukla proposes a more specific thesis, which is that "a condition or state counts as a *health condition* if and only if, given our resources and situation, it *would be best for our 'collective' wellbeing* if it were medicalized—that is, if health professionals and institutions played a substantial role in understanding, identifying, managing and/or mitigating it" (Kukla 2014, 526). While I am in broad agreement with the specific thesis, commitment to the specific thesis is not required for the purpose of the present paper. Rather, what is relevant here is the general thesis that disease is an institutional kind that is constitutively dependent and embedded in the institutions of healthcare.

[7] Other proponents of pragmatist accounts of disease include W. Miller Brown (1985), Leen De Vreese (2017), Rik van der Linden and Maartje Schermer (2022), and Bennett Knox (2023).

Hence, some specific types of conditions are plausibly real kinds. However, the status of any such condition as a disease is informed by its being embedded in the institutions of healthcare.

It is also important to note that Kukla speaks of the *institutions* (plural) of healthcare.[8] Healthcare is not a single monolithic institution but a "messy web of institutions" shaped by contingent historical and cultural developments (Kukla 2022, 139). As shown in section 2.2, the goals and interests of these different institutions may vary. For example, they may include care delivery, access to therapeutic interventions, knowledge production through research, priority setting for public health, financial support, health education, and safeguarding of service users. Some interests may be more social and political, such as those pertaining to social justice and the rights of oppressed groups. It is also worth noting that while the concept of disease can be associated with strategic benefits, it also has negative normative implications, such as connotations of undesirability or defectiveness, which can contribute to stigmatization, disempowerment, exclusion, and other harms, as shown by the examples of homosexuality, gender incongruence, intersex, and neurodivergence discussed in section 2.2.

3.2 Explaining the Disagreement

As noted above, disease is a concept embedded in a web of institutions of healthcare. Such institutional embedding can explain why participants in the disease debate disagree about the concept of disease. The values and interests of the institutions of healthcare—and, indeed, of any given institution—are varied and often in tension with one another. Hence, different conditions may be classified as diseases for different reasons (De Vreese 2017; Kukla 2022; Van der Linden and Schermer 2022). As noted in section 2.2, the classification of infertility as a disease was motivated by priority setting for the provision of assisted reproduction (Ravitsky and Dupras-Leduc 2014). By contrast, the recent court ruling in Germany that a hangover is an illness was motivated by the legal regulation of supplements that are marketed as treatments (BBC News 2019). Moreover, the assessment of whether a given condition is a disease may yield conflicting classifications as a result of these diverging values and interests. For example, the depathologization of gender incongruence in ICD-11 was recognized as important for respecting the rights of trans people to dignity and acceptance, whereas the continued inclusion of gender dysphoria in DSM-5 was supposedly intended to "facilitate clinical care and access to insurance coverage" (APA 2013b, 1).

Given that the institutional roles of the concept of disease are complex and varied, they can motivate different philosophical accounts of disease that emphasize and privilege different roles.[9] For example, Wakefield's harmful dysfunction analysis (1992) mostly engages with one specific institution, which is the American Psychiatric Association. Recently, Wakefield has been concerned about how the expansiveness of the diagnostic

[8] To be precise, Kukla (2022) speaks of the "institutions of *medicine*." Here, I am using the expression "institutions of *healthcare*" to convey the wider set of institutions that interact with the medical profession and influence the classification of disease. Healthcare does not only include the medical profession but also public health agencies, allied health professions, biotechnology industries, and community organizations.

[9] Again, an analogy could be drawn with the concept of crime. The way in which the concept of crime is embedded in the institutions of law is complex. Hence, there is a philosophical debate about the concept of crime, with different participants proposing essentialist, positivist, expressivist, and constructionist theories (Garcia 2019; Henry and Lanier 1998; Polizzi 2016). As Grant Lamond (2007) notes, lawyers and criminologists tend to suggest different answers to the question "what is a crime?", which reflect the different values and interests of these professions.

categories in DSM-5 raises "concerns about violating the boundary between legitimate psychological disorders and normal distress or problems in living" (Wakefield 2016, 107). Accordingly, his harmful dysfunction analysis is partly intended to constrain the extension of the concept of disorder and to protect diagnostic classification from what he considers to be medical overreach. The normativistic theory of Cooper (2020) is also concerned with the institutional practices of the American Psychiatric Association and recently has focused on explicating the ways in which values are inevitably involved in diagnostic classification.

Other philosophical theories of disease engage with other institutional goals. For example, in his holistic theory of health, Lennart Nordenfelt (1987) is explicitly interested in clinical medicine as a practical institution whose purpose is to provide care for patients. Accordingly, he defends ordinary language conceptions of health and disease that serve the aims of clinical practice:

> In the context of health care, the professional (the doctor, nurse, or paramedic) must be able to communicate about health problems with the patient in the ordinary language taken for granted by the patient. Therefore, a theory of health, designed for clinical purposes, must be able to account for the conceptual world embedded in the ordinary language about health, disease, and illness. (Nordenfelt 2018, 12)

It is also interesting to note that several proponents of similar normativistic theories of disease, including Charles Culver (Culver and Gert 1982), Lawrie Reznek (1987), and Bill Fulford (1989), were trained in clinical medicine. Hence, it is understandable that their theories of disease, which emphasize harm and suffering, would be informed by the practical and ethical aims of clinical medicine to support the well-being of patients and alleviate their suffering.

By contrast, Boorse states that his biostatistical theory of disease "really aims at the pathologist's, not the clinician's, concept of disease" (1997, 17). Hence, his biostatistical theory is supposed to serve the theoretical interests of the institution of biomedical science. Despite the problems that have been raised with the biostatistical theory (Cooper 2002; Kingma 2007), it is understandable that a focus on scientific pathology would influence this sort of account. As noted by Ron Amundson and George Lauder (1994), the biomedical disciplines of physiology and anatomy tend to assume a causal role account of function (Cummins 1975). While there is some difference between Boorse's teleological account of function and the causal role account of function, they are similar insofar as they are both ahistorical and they both assign functions relative to chosen capacities.

And so, there is evidence that the different positions in the disease debate have been influenced by a complex institutional background wherein the concept of disease serves different roles. The ability of the institutional account to explain the disagreement among participants in the disease debate is an advantage over the real kind approach. While the real kind approach may be able to accommodate the presence of disagreement, it does not explain such disagreement. No reason is given for why people who are purportedly referring to the same thing would so disagree radically about that thing. By contrast, under the institutional account, the disagreement is explained by participants focusing on different institutional roles served by the concept of disease, including biomedical research (Boorse 1977), diagnostic classification (Cooper 2002; Wakefield 1992), and clinical practice (Culver and Gert 1982; Fulford 1989; Nordenfelt 1987; Reznek 1987).

3.3 Explaining the Agreement

The institutional approach can also explain why, despite their disagreements, participants in the disease debate insist they are talking about the same thing when they are arguing about disease. According to the real kind approach, the relation between the disease debate and disease is representational, insofar as the participants are referring to the same "uniform cluster of biological conditions out there in the world that share objective properties in common" (Fagerberg 2023, 15). Under the institutional account, the relation between the disease debate and disease is also representational. However, rather than referring to a group of conditions with shared biological properties, the participants are referring to a group of conditions that are bound together by a cluster of institutional practices and attitudes, specifically those embedded in the institutions of healthcare. Again, this makes disease somewhat akin to the concept of crime, which refers to a group of acts that, despite their diversity, are bound together by how they are embedded in the institutions of law. As Kukla (2022) notes, it is also somewhat akin to the concept of work, which refers to a diverse group of activities that are bound together by how they are embedded in the economic institutions of wage labor.

Such institutional embedding of the concept of disease is not arbitrary but is informed by the strategic goals, interests, and values of healthcare. While these goals, interests, and values are plural, they are integrated and often dependent on one another. The institutions of healthcare interact closely with one another, such that the pathologization of a given condition for whatever reason brings that condition within the purview of a common cluster of resources and practices. Crucially, these interactions are not optional in the manner of, for example, the interactions between different galleries in the art world. Rather, the interactions between the institutions of healthcare are mutually dependent because the goals of one institution often rely on the resources of other institutions. As noted in section 2.4, medicine has the technical resources to intervene in a wide range of bodily conditions, regardless of whether they fall under a real kind, and so there is a strategic interest in bringing a condition within the purview of medicine if mobilizing these technical resources is conducive to meeting the relevant goals. For example, the cases of obesity and infertility discussed in section 2.2 illustrate how conditions that are classified as diseases for the purposes of public health subsequently become foci for clinical practice, biomedical research, and healthcare funding because these activities are crucial for realizing the goals of public health. Accordingly, Kukla writes:

> Despite this messiness and diversity, to classify something as a disease, or as work, from within any context, is always to bring a specific institutional apparatus on board: in insisting that something is work, or a disease, I am insisting that the institutional resources and norms, including (and perhaps sometimes only) the conceptual resources and norms, of the wage labor system or the medical system be mobilized. (2022, 150)

And so, although the various conditions that are classified as diseases are not biologically unified, participants in the disease debate are talking about the same thing insofar as they are referring to a group of conditions that are bound together by a common cluster of institutional practices, attitudes, and resources, which interact in mutually dependent ways.

The above is in contrast to the real kind approach, which suggests that the participants in the disease debate are talking about the same thing because disease corresponds to a biologically unified real kind. Furthermore, Fagerberg claims that the participants in the disease debate are influenced by the presence of this real kind, "even if the debate's participants lack awareness of, or even deny, this structure" (2023, 14). Here, an analogous move is also available under an institutional account. Of course, some of our intuitions do reflect our abilities to discern real kinds. For example, children can usually discern that lions and tigers are different creatures long before they learn about the biology of speciation. However, many other intuitions fail to correspond to real kinds but instead correspond to institutional kinds. Consider the example of gender expression. As famously argued by Simone de Beauvoir (1949), there has been a tendency throughout history to misattribute behavioral differences between the genders to presumed biological differences, rather than to cultural norms and social structures. Indeed, this provides an example of how social institutions often shape people's intuitions and practices in more pervasive ways than the presence of real kinds, such that people may not explicitly realize how their intuitions are influenced by these institutions. Gendered institutions have perpetuated biologistic assumptions about normative gendered behaviors, even though such gendered behaviors are not actually attributable to intrinsic biological properties. Likewise, the institutional values and interests of healthcare have shaped how various causes of bodily and emotional suffering have been indexed to a common cluster of institutional resources and practices, even though they do not share a common biological structure.

Beyond helping to explain the disease debate, the institutional account can help to resolve it by indicating the appropriate sort of methodology. The observation that instances of disease are bound together by institutional practices invites the further question of whether there are deeper underlying reasons for why these conditions were brought within the purview of these institutions. Given the arguments against the real kind approach in section 2, the question cannot be answered solely by looking at biomedical facts about the conditions. Moreover, it cannot be answered solely through a priori conceptual analysis. Rather, it is a sociological and historical question that requires a critical examination of the debates, circumstances, and developments that inform the institutional decisions to classify the conditions as diseases. Hence, to answer the question, we need sociological and historical research, as well as philosophical and biomedical research. This view is endorsed by Kincaid: "While understanding the processes involved in labeling diseases is an interesting project, it is not one to be done by conceptual analysis tested against counterexamples and intuitions. Rather, it is a science studies question that is in part sociological and historical in nature" (2008, 370).

As suggested by the examples discussed in section 2.2, it is plausible that many such institutional decisions are informed by an array of scientific, ethical, and pragmatic interests and values, as well as facts about the technical resources available to medicine. It is also plausible that the decisions are influenced by contingent historical and social circumstances. For example, Cooper (2024) notes that historically some aspects of healthcare were sponsored by the state and were aimed at improving the performances of groups such as workers and pupils, whereas other aspects of healthcare were provided by independent physicians and were aimed at improving the well-being of patients and alleviating their suffering. Nonetheless, bringing these conditions together under the

category of disease unifies them by indexing them to a common cluster of institutional resources, practices, and attitudes.

3.4 Explaining the Revisionism

Finally, the institutional account can explain the revisionist inclinations of participants in the disease debate. As noted in section 1.2, Fagerberg suggests that the participants in the disease debate seem to be stipulating how the concept of disease should be used, which is incompatible with the conservative aims of conceptual analysis. However, such revisionism is compatible with the understanding that disease is an institutional kind.

As Kukla (2014) notes, the institutional account of disease is not a pure social constructionist account of disease such as that proposed by H. Tristram Engelhardt (1976). Under such a social constructionist account, what counts as a disease is simply what the medical profession treats as a disease, which has the implication that the medical profession cannot be mistaken about what a disease is. By contrast, the institutional account is *normative,* rather than *descriptive*. The concept of disease is supposed to serve various institutional goals and interests. Whether the pathologization of a certain condition serves these goals and interests is something that can be assessed. Kukla writes:

> The essential idea here is that real health conditions are conditions for which the tools and methods and support of medicine and its institutional mechanisms are genuinely helpful, given both the natural and the social facts. This is something we can be wrong about and can empirically discover … For example, it turned out that even though, as Engelhardt points out, people thought that the tools of medicine would be helpful when applied to masturbators, they were in fact wrong. (2014, 526)

If it turns out that pathologization has failed to serve these goals and interests, it is wrong to pathologize the condition.

The normativity of the institutional account complements the plurality of institutional interests and values noted in section 3.1. The institutions of healthcare do not just include the medical profession but also encompass allied health professions, public health agencies, and other organizations. Furthermore, these institutions interact with other institutions, such as law, politics, and education. Given that the goals and interests of the institutions of healthcare are varied, the decisions to classify conditions as diseases often involve debates between different stakeholders about whose goals and interests are served by these classifications, as illustrated by the examples of pathologization and depathologization in section 2.2. This protects the institutional use of the concept of disease against medical paternalism, as different stakeholders can assess which applications of the term are appropriate by assessing whether they serve the relevant ethical, pragmatic, and epistemic goals.

Such normativity also makes sense of the revisionary inclinations of participants in the disease debate. For example, Wakefield's (1992) opposition to what he considers medical overreach in the DSM can be interpreted as the contention that the misapplication of the concept of disorder does not serve the goals and interests of mental healthcare. Accordingly, he notes that "the mental health theoretician is interested in the functions that people care about and need within the current social environment, not those that are interesting merely on evolutionary theoretical grounds" (Wakefield 1992, 384). Similarly, Cooper's (2002)

suggestion that unwanted pregnancy could be considered a disorder can be interpreted as the contention that may be appropriate for the institutions of healthcare to classify unwanted pregnancy as a disorder in view of its medical treatability, its potential harmfulness, and the widespread availability of contraception.

The above shows that the institutional approach to disease can make sense of the disease debate without relying on any metaphysical commitment to the assumption that disease is a real kind. Moreover, the institutional approach can account for features that the real kind approach cannot, such as the presence of disagreement among the participants in the disease debate, the eclectic nature of disease classification, and the complex considerations that inform pathologization and depathologization. Therefore, the institutional approach is more explanatorily comprehensive than the real kind approach while also placing fewer metaphysical demands on medicine. Before concluding, I address two further points of contention between the institutional approach and the real kind approach.

4. Further Points

4.1 Real Kinds and Stability

The proponent of the real kind approach might contend that we should base the study of disease on a real kind because real kinds are stable enough to underpin our theories, whereas social and linguistic practices are liable to change. Fagerberg writes:

> There is nothing about cultural, social, and linguistic practices that guarantees invariance over time. However, the properties associated with a real kind can be expected to be fairly stable. It would make sense, then, to remain loyal to a particular theory of how the world actually is—that is, which causal structure underpins instances of pathology in the world—and to defend this theory against changing conceptions (ideas, beliefs, and so on) that fail to reflect your theory. (2023, 16)

However, I argue that this passage underestimates how stable institutional kinds are. Institutions have structures and mechanisms that sustain, perpetuate, and regulate our social and linguistic practices. Consider the example of gender expression discussed in section 3.3. Gendered institutions have perpetuated and regulated norms and expectations regarding gendered behaviors, even though such gendered behaviors are not underpinned by intrinsic biological kinds. Also consider the stability of legislations and the regulatory processes within the institutions of law that make it very difficult to change these legislations, or the regulation of standardized currency by financial institutions. Likewise, medical practices and concepts are sustained and regulated by structures and mechanisms within the institutions of healthcare, including medical education, textbooks and manuals, policies and guidelines, professional standards, medical record-keeping, and clinical governance procedures. Thus, even if disease does not form a real kind, these institutional structures and mechanisms give the concept enough stability to support the practices of healthcare.

4.2 More on Revisionism

The proponent of the real kind approach could defend the approach by doubling down on its revisionist agenda. Under this agenda, some medical conditions may turn out to fall under a real kind and only these conditions are bona fide diseases, whereas those medical conditions that do not fall under a real kind are not diseases. This would suggest that the institutions of healthcare are often misapplying the term "disease":

> Indeed, the linguistic community may be systematically mistaken as to whether some particular instance is an instance of the relevant real kind. Applying this to the disease debate, then, it might be that mental health professionals in the United States are systematically wrong about what sorts of mental conditions count as instances of pathology. Thus, if pathology is a real kind, we can make good sense of principled revisionism as regards the concept's proper application. (Fagerberg 2023, 16)

Let "disease^{I}" denote the conception of disease as conventionally used by the institutions of healthcare and let "disease^{R}" denote the revisionist conception of disease as a real kind.

Such a revisionist agenda is potentially problematic if "disease^{R}" becomes too far removed from the actual interests and practices of healthcare. Of course, there are cases where colloquial uses of terms do not accord with the scientific uses of these terms by the relevant disciplines. For example, consider the uses of the category "reptiles." The theoretical category "reptiles^{T}" forms a clade that includes birds according to evolutionary zoology, but the colloquial use of the category "reptiles^{C}" usually excludes birds. However, this is not what is happening with the uses of "disease." The use of "disease^{I}" by the institutions of healthcare is not colloquial usage. Rather, healthcare is an appropriate domain to have a high degree of authority over the term "disease," because the main theoretical and practical roles of the concept are dependent on and situated in the institutions of healthcare. As W. Miller Brown (1985) notes, there is no distinct subdiscipline of "theoretical medicine" on which medical practice and research depend, but rather medicine develops and refines its concepts through their practical and epistemic applications. And so, given how the concept of disease is embedded in the institutions of healthcare, any stipulative account of disease that digresses too far from the practices of healthcare is arguably not talking about disease anymore but is talking about something else.

To be clear, the problem here is not revisionism itself, but the loss of relevance to the practices of healthcare. Revisionism can sometimes be helpful, such as in ameliorative analysis where a concept is revised so that it can serve legitimate interests and achieve practical benefits for stakeholders (Haslanger 2005). Indeed, I argued in section 3.4 that the institutional account of disease can accommodate a revisionist agenda in healthcare, which has benefits for relevant institutions and stakeholders, as illustrated by the complex debates and decisions regarding pathologization and depathologization discussed in section 2.2. This openness to revision is what protects the institutional concept of disease from medical paternalism, as the practices of healthcare are bound up with the interests and values of multiple interacting institutions. Nonetheless, for such a revisionist analysis to be successful, the revised concept must be shown to have these practical benefits. Without such benefits, revisionism is unjustified.

In her discussion of the domino theory of disease, Fagerberg (2025) does address the issue of revisionism. However, I argue that she underestimates how revisionist the theory potentially is. In section 2.3, I noted that psychiatric disorders are especially problematic for any theory of disease based on a selected effect account of function because we are not epistemically situated to demonstrate whether many of the relevant psychological features are functional, dysfunctional, mismatched, or adaptively neutral (Maung 2024). Many such cases could be excluded from "disease^{R}" despite the suffering with which they are associated. There are also the cases mentioned in sections 2.1 and 2.3 of localized diseases that do not have effects on other bodily systems and transient infections that elicit bodily responses that are functional. Such cases would be excluded from "disease^{R}." Hence, the burden is on the proponent of the real kind approach to disease to show why "disease^{R}" should be preferred over "disease^{I}."

As noted earlier, the success of medicine does not hinge on the category of disease being a unified real kind. Medicine is a discipline with ethical, social, and pragmatic interests that go well beyond the theoretical classification of bodily conditions. An advantage of "disease^{I}" is that it is intended to serve these diverse interests. Because it is informed by ethical considerations concerning suffering, harm, and social burdens, it can serve the purposes of setting priorities for research, treatment, and prevention. Because it is informed by pragmatic considerations concerning healthcare provision and regulation, it can serve the purposes of justifying insurance reimbursement, workplace accommodations, and institutional support. Because it is informed by social considerations concerning public understandings, stigma, and justice, it can accommodate the needs of the communities affected by pathologization and depathologization.

By contrast, "disease^{R}" is much more limited in its application. Potentially, "disease^{R}" could support a research program that aims to find the common causal structure shared by a subset of bodily conditions, which may inform research into therapeutic interventions into these conditions. However, it would exclude the conditions under the domain of medicine that do not share this causal structure. Given how unlikely it is that the myriad causes of bodily suffering that are currently treated by medicine form a unified real kind, "disease^{R}" would be disadvantageous for the diverse therapeutic purposes of clinical medicine. It would also be disadvantageous for the preventative purposes of public health, which are informed by the considerations of social burdens and suffering, rather than by the presence of a unified biological kind. Finally, it does not account for the ethical and social considerations relevant to conversations about pathologization, depathologization, and the proper domain of healthcare with regard to different stakeholders. Therefore, while "disease^{R}" may serve the purpose of specifying a limited subset of bodily conditions for scientific study, it would be less suited for the much wider purposes of healthcare.

The above problem is further compounded by the relativity of real kinds to specific disciplinary matrices. Under the homeostatic property cluster account, what comprises a real kind is not simply given but is relative to the explanatory interests and inferential practices of the domain of inquiry. This point is emphasized by Boyd himself, who initially developed the homeostatic property cluster account:

> It follows from the account developed in the preceding section that the naturalness of a natural kind will ordinarily be a matter of the role that reference to it plays in some particular family of inductive or explanatory practices. A kind may be natural

> "from the point of view of" some discipline or disciplinary matrix, but not "from the point of view of" another. (Boyd 1999, 159–160)

In his later work, Boyd contends that we cannot separate talk of real kinds from our interests because our concepts and intentions are themselves part of the causal structure of the world: "The accommodationist conception entails that descriptive, conceptual, and intentional factors figure fundamentally in establishing reference to natural kinds" (Boyd 2010, 223). Because different disciplinary matrices have different theoretical concepts and study properties at different levels of organization, what may be a real kind in physiology, for example, may not be a real kind in epidemiology or psychology.

Which disciplinary matrix is relevant to the proponent of the real kind approach to the disease debate? As noted above, medicine is a discipline with diverse interests, which are informed by diverse domains of inquiry, including physiology, anatomy, biochemistry, pharmacology, microbiology, embryology, psychology, epidemiology, sociology, and ethics. While we may, for example, be able to specify a category that supports inductive inferences in immunology, this may not support inductive inferences in psychiatry and vice versa. Again, this underscores the problem of scope. A real kind that is specified relative to any given disciplinary matrix may fail to support the explanatory interests and inferential practices of the other disciplinary matrices that are also crucial to healthcare. Relatedly, Valerie Hardcastle notes that the assigning of a function is always relative to a chosen level of organization, which involves a value judgment about what level of organization "we find worthy of teleological language" (2002, 149). Accordingly, what may be a function relative to one level of organization may qualify as a dysfunction relative to another level of organization.

This has two implications. First, it further underscores the disunity of disease. The proponent of the real kind approach may have to concede that there is no single specification of a real kind that serves the varied interests of medicine, but rather there are multiple ways to specify real kinds across biological, psychological, and social domains that are relative to different aspects of medicine. Second, the issue of which of these domains, if any, takes precedence when talking about disease is not given a priori but depends on the pragmatic goals and interests of medicine in that specific context. Thus, even if real kinds can be specified across different disciplinary matrices, the issue of what counts as a disease is still ultimately informed by what is deemed relevant to the interests and practices of healthcare.

5. Conclusion

The arguments and examples discussed above raise the possibility that disease may not form a unified real kind. Consequently, Fagerberg's (2023) proposal that the disease debate should proceed on the assumption that disease is a real kind is precarious. Instead, drawing on recent work by Kukla (2014, 2022), I have proposed that the disease debate in the philosophy of medicine should pay more attention to concept embedded in the institutions of healthcare. By understanding disease as an institutional kind, we can make sense of key features of the disease debate, such as the sources of disagreement, the sources of agreement, and the revisionist inclinations of the debate's participants, without any commitment to the metaphysical assumption that disease is a real kind. The institutional

account can provide a more adequate philosophical understanding of disease that captures the complex processes of pathologization and depathologization while also allowing for normative critique of how the concept of disease is applied by the institutions of healthcare.

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