# Value-promoting concepts in the health sciences and public health

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**Abstract.** In this paper, I explain how concepts, methods, and values are entangled. While the argument can be applied widely across the sciences, I focus here on the sciences of health and disease, and on public health. I will argue, on top of well-established arguments, not only that scientific methods and concepts are value-*laden*, but also value-*promoting*, and so any normative questions cannot be asked at the end or outside of the scientific process, but should be an integral part of it. Ultimately, this is to provide an argument for the urgent need to synergistically combine epistemology and ethics, in public health as well as in other scientific and policy contexts.

**Keywords**: public health; value-laden; value-promoting; epistemology-cum-ethics

## 1. Introduction

Philosophy of science is a diverse sub-field within philosophy. Some of the questions it asks I call ‘cross-cutting’, because they can be asked across different scientific domains, from physics to economics, from anthropology to molecular biology: *How do we explain? What are causes and effects? When is an experiment, model, analytic method valid?* Providing an answer to questions like this means to give general accounts of, say, explanation, causation, or modelling. Some other questions I call ‘domain-specific’ because they arise in specific scientific domains, say biology, physics, or anthropology: *What are genes? What is the role of Higgs mechanism in the standard model? What is agency? What is a pathological condition?* Providing an answer to questions like these requires to engage deeply with the scientific practices, theories, and concepts proper to the respective domains.

Interestingly, however, cross-cut and domain-specific questions are not independent from each other. Quite the contrary is the case, and later in the paper I will exemplify this mutual dependency drawing on the debate on the conceptualization of health and disease. One reason to keep the distinction, however, is to foster unity and synergies between domain-specific approaches, and in view of developing dynamic and flexible accounts of cross-cutting concepts, rather than to crystalize the fragmentation of philosophy of science into subfields. Another reason to keep the distinction is to provide a different perspective on an important issue that some part of philosophy of science has long and well established: science (and philosophy of science) is *not* value-free. But *where exactly* do values come in? At which point of the process? And what are the consequences at the level of action and policy?

In this paper, I reverse the perspective usually taken in the ‘science and values’ literature. Large part of the literature aims to show that science is value-laden, and runs retrospective analyses of the role of values in the scientific process, or in policy contexts. Here, I try to run the analysis too, but in the opposite direction. I aim to explore how scientific concepts are not just value-laden, but value-*promoting*. Differently put, I want to discuss, *prospectively*, how the concepts and methods we develop actually *promote* the values of the actions that (should) follow from them. This value-promotion aspect of concepts is at work well before we turn knowledge into action, in the form of policy interventions. I take the health sciences and public health and, specifically, the conceptualization of health and disease, as a paradigmatic example of how concepts are value-promoting.

In section 2, I introduce the (philosophy of the) health sciences and public health as the ‘newest’ addition to the list of special sciences, each with its own domain-specific questions. Among a large range of questions, I focus on the conceptualization of health and disease, and I explain the way in which answering this question is, in my view, dependent on a specific approach to cross-cutting questions on causation and mechanisms. Notably, I take a bio-social definition of health and disease as an adamant example of the entanglement between cross-cutting and domain-specific questions.

In section 3, I explore the other entanglement, namely between concepts and actions. I first formulate a general question about what actions should follow from such-and-such scientific concepts, and then particularize the argument to the chosen case: what actions should follow from a bio-social conceptualization of health and disease? I will develop the idea that any given conceptualization of health and disease (as well as any scientific concept) promotes some values, and these values should subsequently shape and inform the actions to follow (e.g. public health interventions).

Ultimately, the entanglement discussed in section 3 is about two types of questions: epistemological/methodological and normative ones. The argument is a plea for a more synergistic approach to public health ethics, which, to my knowledge, remains largely disconnected from the kind of philosophy of science questions discussed in section 2, and that I hope to foster with this programmatic article.

## 2. Health Sciences and Public Health

### 2.1 Conceptualising Health and Disease

At the time of writing, health sciences and public health can be finally listed among the ‘legitimate’ special sciences that PhilSci takes interest in, as testified by the large number of publications in the field and the establishment of professional societies and of specialized conferences and journals. But this has been a long process of legitimization, analogue to the struggle that philosophy of the social sciences and economics underwent just before the health sciences.

There is a lot that philosophers of science can investigate in these fields. There is a range of questions related to methods, their nature, and use: the health sciences employ, in fact, observational, experimental, and increasingly more data/technology-driven ones. There is a range of questions related to the concepts that the health sciences employ, specific to them (e.g., risk factor) or borrowed from biology (e.g. genetic disease) or from social science (e.g. social determinant). There is also a wide range of different actions that stem from the science of health: diagnosis and prognosis, (individual) treatment, public health interventions. Last but not least, the health sciences raise crucial questions of contextualization at historical, cultural, ethico-political level, and other. This explains the diversity of ‘PhilMed’, in terms of the type of epistemological/methodological, metaphysical/ontological, and ethico-political questions that it addresses, as well as the need for an even broader approach - Medical Humanities - in which socio-cultural, anthropological, sociological, or narrative approaches are employed.

Within this very wide range of options, I now zoom into questions of conceptualization of health and disease, which remain central and crucial to the health sciences and public health.

The question of conceptualizing health and disease is essential to the field, and one that has multiple traditions and approaches (Murphy 2020; Smart 2016). What is ‘normal’ and what is ‘pathological’ - an expression that, for lack of a better one, I am deliberately borrowing from Canguilhem (1989) - condenses and includes numerous dimensions and approaches, for instance: biological (Carter 2003), statistical (Boorse 1975), experimental (Bernard 2012), social (Barnes 2016), political (Foucault 2014), historical (Conti 2018). Questions about the nature of health and disease are at once metaphysical, epistemological, methodological, and normative in character.

My own preference, to act above the board, is to answer the metaphysical question about health and disease by first working out their epistemology and methodology. In other words, the approach I take is to answer *What is X?* by replacing it with the question *How do we study X?*. With this strategy, I put the practice of science first, a move that has been adopted by a number of other scholars too, and not just in PhilMed (Ankeny et al. 2011; Boon 2017).

In the specific case of the conceptualization of health and disease, the question can effectively be rephrased in terms of the study of the *causes and mechanisms* of health and disease (Clarke and Russo 2017). And, in turn, the study of the causes and mechanisms of health and disease is itself a diverse field: from bio-chemistry to clinical epidemiology, from evidence-based approaches to narrative medicines - the way in which we try to understand the causes and mechanisms of health or pathological processes is really wide and broad. Within this broad and wide spectrum, one specific question concerns *causal* approaches, and notably those that try to elucidate the role of social factors for health inequalities, on top of the well-studied biological ones (Kelly, Kelly, & Russo 2014; Kelly & Russo 2017; Russo 2011; Clarke, Ghiara, & Russo 2019).

### 2.2 Bio-social causes of health and disease

Having set up a methodological approach to define health and disease, I now dig into one specific difficulty, namely their mixed social and biological nature. I explain why, despite the abundant body of research on social factors and determinants, this is still a controversial point to address, and how descriptive and normative questions are entangled.

Historically, 19th Century public health was much about the socio-economic dimension of health and disease (see e.g. Cosmacini 2015; Porter 2005; Rosen 1993; Sand 1952). Partly due to the limited knowledge about the biochemistry of these processes, public health interventions had to focus on behavior and other social factors, and the science that accompanied and supported them was much about describing the socio-economic conditions in which health and diseased happened (Antonovsky 1965; Engel 1980; Gairdner 1862).

With the rise of experimental medicine, and the increasing understanding of the bio-chemical processes at the basis of health and disease, the study of social factors focused on establishing remote conditions, or ‘the causes of causes’ (Rose 2001). This is not to say that social factors disappeared from the radar, but rather that research on the socio-economic dimension of health and disease took directions other than an explicit *aetiological* one (Bambra 2016; Bartley 2017; Freidson 2007; Johan P. Mackenbach 2006; Kadushin 1964; M. P. Kelly and Doohan 2012; M. G. Marmot et al. 1978; M. Marmot 2005; 2010). (Whenever I write ‘social’ or ‘socio-economic’ factors, this should include cultural, demographic, or any other factor that pertains to the social sphere, broadly construed.) Even from a cursory survey of social epidemiology and the sociology of health, it is easy to see that there is plentiful research establishing that health and disease are associated with socio-economic factors, and that inequalities in health are associated with socio-economic inequalities. And there is also an incredibly vast literature describing the social contexts in which health and disease happen, the power structures that interfere with individual or public health interventions, etc. (see e.g. Bury 1982; Freidson 2007; Gerhardt 1989; Knudsen & Vogd 2015; Mechanic 1962; Parsons 1951).

No-one, at the time of writing, would deny that a strong and steady association between social factors and health exist. But this is a *descriptive* claim. The contentious claim is *causal*, namely that social factors are *active* causes in the complex and mixed (socio-biological) mechanisms of health and disease (Kelly and Russo 2017;  Russo 2011; 2012). The claim is contentious because solid conceptual foundations for such causal claim are still under development. We need in fact specific and tailor-made conceptualization of causation and mechanism that can account for the mixed (socio-biological) nature of health and disease. Such concepts would allow us to establish that social factors are *proximate*, not distant causes of health and disease, on par with biological factors. While research in this direction exist, it needs further development in cooperation with health and social scientists, practitioners, and policy makers (Anjum, Copeland, & Rocca 2020; Clarke, Ghiara, & Russo 2019). This is an important line of research, and in the next section I aim to show that its relevance, timeliness, and importance is not merely conceptual, but instead has a bearing on the interventions that ought to follow from given conceptualization.

## 3. Concepts and actions

### 3.1 The ‘epistemological’ and the ‘normative’

Public health takes advantage of a vast knowledge-base, spanning epidemiology, economics and numerous other fields. Yet, the link between concepts and actions remains problematic. On the one hand, the relation is problematic because ‘simple’ casual narratives that sometimes fit the explanation of infectious diseases, very rarely - if ever - fit the complex and articulated field of public health interventions (Kelly and Russo 2017). On the other, the relation is problematic because, not surprisingly, it falls short of value-neutrality. In the following section, I explore the way in which scientific concepts are not just value-laden, but also value-*promoting*. To properly account for the value-promoting aspect of concepts, we need an approach in which epistemology and ethics go hand in hand, or what I’d call *epistemology-cum-ethics*.

Let’s begin with the knowledge base of public health, which is arguably provided by epidemiology and its vast range of sub-fields. The borders between epidemiology and public health are not so clear-cut, and it is not obvious to establish whether and how the results of epidemiology should be (in)directly translated into concrete recommendation for policy interventions, also considering that any intervention will be laden with ethical values (see e.g.: Mackenbach 1995; Pearce 1996; Rogawski, Gray, and Poole 2016; Valles 2018). The question I pose here is similar, but arises at a stage that is earlier than the interpretation of results and their translation into concrete actions. My question is about how any given scientific concept entails specific consequences at the ethico-political level, in virtue of its definition or characterization.

To be sure, a similar question has been asked in philosophy of science, initiated by David Teira (and collaborators); in this work, they investigated how different concepts of evidence (or rather, different requirements for evidence standards) may lead to very different political attitudes, for instance in the context of drug safety (Andreoletti & Teira 2019; Teira 2013). The question is part of the debate on evidential pluralism, namely the idea that, to establish causal claims in medicine (and elsewhere), both evidence of correlation and of mechanism is needed (Clarke et al. 2014; Parkkinen et al. 2018; Illari 2011; Russo and Williamson 2007). Yet, how high we decide to put the bar of evidence has, according to these authors, important consequences about how much autonomy we give to patients to decide about their own health and the treatments they are willing to undertake.

This line of work is, in my view, important and worth developing further. My argument here tries to streamline and extend it first, and then to apply it to the problem of conceptualizing health and disease as bio-social phenomena.

The general question to be asked is the following. *If* we conceptualize X such-and-such, *then* what actions should follow? One can replace X by their favourite concept: health, evidence, adverse drug reaction, causality, etc. The kind of normativity here involved is double. On the one hand, it adds to the vast literature on the non-neutrality of philosophical concepts (see e.g. Douglas 2009; Carrier 2013; Gonzalez 2013; Kincaid, Dupré, and Wylie 2007). On the other hand, it also implies that philosophy (of science) is part and parcel of the scientific and policy process, not a cherry on the cake or a watch dog.

In our specific case, the argument can be formulated as follows. *If* ‘the social’ has an active causal role in health and disease, *then* what public health interventions should follow? Until now, the need for such an argument has been established on purely conceptual grounds, but evidence suggests that the question needs to be asked in applied settings, too. In fact, there is a global trend that sees many chronic diseases, in principle preventable, on the rise (Busse, World Health Organization, and European Observatory on Health Systems and Policies 2010; Hajat and Stein 2018; Raghupathi and Raghupathi 2018); this is true even for infectious diseases (Smith et al. 2014), and with important consequences on the management of health services (Bar-Yam 2006; Rechel et al. 2018). While a lot at the level of public health *is* done, the conjecture is that *not* *enough* is done to intervene at the social level, or perhaps what is done does not target ‘the social’ *in the right way*.

Consider the obesity epidemic. There is a wide recognition that socio-economic factors, besides biological ones, are responsible for the steep rise of obesity across the globe and especially among children. Yet, understanding how these bio-social mechanisms of obesity work, conceptually and methodologically remains problematic (Russo 2012). Reducing obesity is a top priority of European health policies, and as numerous documents, reports, and directives show, there is an explicit claim about the role of socio-economic factors (e.g., behavior) and about the need for interventions that tackle these factors (see e.g. European Commission 2007; WHO 2014; Erixon 2017).

One of the biggest actions concerns the regulation of food labelling. By providing the right information to the citizen about food and their nutrients, the action hopes to change behavior and thus to change obesity rates. However, regulating food labelling is ultimately about the biology of obesity, not about its socio-economic components. Acting on the socio-economic component would not only require to regulate food labelling, but to further regulate food industry, to facilitate access to healthy (but cheaper) food, to create environments for better education about healthy behavior, or that promote physical activity, etc. The point is subtle but fundamental. The current set up of food labelling regulation is not quite a *public* or *population* health intervention: what it does is to impose that correct information about food is provided, and then all is left to the *individual* to choose what food to buy and eat, on the basis of the information given, which is ultimately about biology. But the socio-economic factors leading some individuals or groups to buy and eat unhealthy food remain totally untouched, while reducing the price of healthy food can incentivize healthy eating (French 2003).

### 3.2 Why public health ethics needs philosophy of science

So far, I argued that philosophy of science questions, problems, and concepts are non-neutral from an ethico-political perspective. But how should one setup normative questions then? To be sure, there is a whole set of questions to be asked, including: (i) Which ethico-political values are at work in the scientific concepts we use/develop? (ii) What is the role of scientists and experts in the process of policy making? (iii) What is the relation between science and policy making? (iv) How can we design a decision-making process in which science, policy making, and the public all have a role? Space does not allow us to address all these questions, and I will confine the discussion to the first question, trying to articulate the relations between philosophy of science and public health ethics. In the following, I reconstruct the main lines of the debate in public health ethics as being largely detached from the epistemological and methodological questions that are foundational to the health sciences and public health. In attempting to reconstruct the debate in public health ethics (PHE), space does not allow me to make justice of the breadth and depth of all the arguments given, but the hope is to signal that, in the midst of excellent scholarship already and currently produced, there is still space for a further addition, notably the synergy with philosophy of science. In other words, this is not to diminish the importance of this field, but to re-claim a space in which epistemology and ethics can and should co-habit.

PHE branched out from bio-ethics, developing an autonomous set of questions, tailored to the specific problems of PH, notably the focus on *populations* and on ethics issues as they arise at the group level (Dawson & Verweij 2008; 2009). Large part of the literature is problem-based, going straight into specific issues or dilemmas (Johnson 1986; Loewy & Loewy 2004; Bolan et al. 2016; D. S. Goldberg 2017), as is typical of analytic approaches in ethics and political philosophy (Jonsen & Toulmin 1989). Sometimes, the choice or adoption of an ethical theory comes before the problem, as if one has to adhere to one ethical approach, and then address any specific issue through these lenses (Brännmark 2019; Gordijn and ten Have 2019). When it comes to social factors and health, the discussion jumps straight to questions of equity, justice, paternalism, etc. (Bayer & Beauchamp 2007; Goldberg 2014; Schramme 2015b; 2018; Valles 2018; 2019; Venkatapuram 2020a; 2020b). These worries are of course real, important, and urgent.

But the way in which these debates happen seems to suggest a strict division of labour. The health sciences provide *methods and data analysis*; philosophy of science/medicine provides the *concepts*; ethics and political philosophy provides the *norms*. Unfortunately, such strict division of labour is not viable anymore - if it ever was. Questions about methods, concepts, and norms are deeply entangled, and cannot be addressed in isolation.

For instance Schramme (2015a; 2017) argues that that the concept of health is value-laden in PH. His point focuses directly to the contexts in which action is taken. This is certainly true, and Schramme’s arguments are more than cogent. But more can be said, or so I argue: health is more than value-laden, it is also value-promoting already at the conceptual and methodological level, and in a way that I describe next.

### 3.3 Value-promoting concepts

That science is value-laden has been long studied and documented in philosophy of science as well as in social studies of science. What is relatively less appreciated is that value-ladenness may flow in two directions:

(i) Values influence our concepts, methods, and interventions;

(ii) Concepts and methods influence the values we promote in the interventions.

Admittedly, the first direction has been the main focus, with plenty of scholarship analyzing case studies from the recent or more remote past, to show precisely that the thesis of value-neutrality of science is a chimera, that values do play a role in the scientific process, and that much of the action that follows the science is likewise value-laden.

In my reading of this literature, however, the second direction has not been examined on its own, which I attempt to undertake in the sequel of the paper. While my argument is general and virtually applies to any concepts or methods developed in various scientific contexts, I will again use the issue of conceptualizing health as a paradigmatic example of what is at stake.

That ‘health and disease’ are normative concepts in the practice of public health or of individual treatment has been well established by parts of public health ethics and philosophy of medicine, as noted earlier. My argument resonates with that of Goldberg (2015), who claims that “[…] Policy and ethical discourse on the SDOH [social determinants of health] cannot proceed without a sufficient understanding of the social epidemiologic evidence base that animates scholarship, practice, and policy on the SDOH” (p.58), and ultimately aims to push it even further. My point is that health and disease carry normativity *already* at the level of scientific concepts, well before they reach the level of action, which is often evaluated post-hoc. The question is not just to get the available knowledge base right, but is to understand what should normatively follow from this knowledge base. Let me explain what I mean.

Whether social factors are conceptualized as proximate (rather than distant) causes does make a difference to the actions that will follow. This is because the logic of public health interventions, if typically taken, follows a kind of linear causal reasoning: if X causes Y, we need to intervene on X in order to change Y. There are in fact two issues at stake here.

First, as Kelly and Russo (2017) show, public health cannot follow a simplified causal narrative that merely emulates the aetiology of infectious disease: if pathogen X causes disease Y, reducing exposure to X will lead to a reduced burden of disease Y. Public health must instead follow a more complex and nuanced causal narrative, in which we act on different paths, and not only or necessarily on the direct path from pathogen to health outcome. This leads us to the second point, namely that these paths, direct or indirect, include socio-economic factors as proximate causes of health and disease. To put it differently, if we accept and endorse the view that socio-economic factors *are* causes, then our PH interventions should target them, too.

Let us consider again obesity. As we saw earlier, there is broad consensus that obesity has socio-economic causes, too, and that public health interventions should tackle them. But whether these socio-economic factors are proximate, or distant, will make a difference. Patients and citizens are exposed to a whole range of socio-economic factors causing obesity; in the broad environment in which this exposure happens, interventions cannot simply defer the responsibility and action to the choice of individuals. What to do with food labelling, the food industry, or marking of unhealthy foods *is* a consequence of how we conceptualize health and disease. And if socio-economic conditions are major causal factors, then we should do something with them. This may go as far as regulating food industry or food marketing very differently than what is currently done at the European or national level, and in ways that consider the fight against health and socio-economic inequalities as a priority, or that promote health as a public good, or other.

This is of course easier said than done, because all of a sudden conceptualizing health and disease is *not* independent from questions at the ethico-political level, for instance about who holds responsibility for the health of individuals, or the role of governments and other institutions in forcing certain interventions, or about the priorities of values to promote (e.g. individual freedom versus health as a public good).

I exemplified the meaning of value-promoting concepts using the case of obesity, but the same reasoning applies to very many areas. On what grounds should we impose vaccination? The question is at once ethico-political *and* scientific, as it is not just or only about an ethico-political framework that supports or loosens the compulsoriness of vaccination, but it is *also* about whether health is an ‘individual’ or ‘population’ property. On what grounds should we enforce lockdowns in the middle of the pandemic? Again, the question is not just, or only, about whether the government can enforce such a measure (which in fact may change according to legal provisions of any given country), but is *also* about whether social factors causing or preventing the spread of the virus are real, proximate causes to intervene upon.

## 4. Conclusion

In this paper, I revived the old distinction in philosophy of science about ‘cross-cutting’ and ‘domain-specific’ questions. I argued that the distinction is worth using for conceptual clarity and ultimately to foster dialogue between the philosophy of different special sciences, and between philosophy of science, ethics and political philosophy, and policy.

I exemplified the need to ask both types of questions in a synergistic way with debates in philosophy of medicine, and specifically taking the problem of conceptualizing health and disease, as a paradigmatic example. In fact, conceptualizing health and disease is a fundamental domain-specific question in philosophy of medicine, and one that is related to cross-cutting questions about causation and mechanisms. More specifically, a causal conceptualization of health and disease in which social factors are proximate causes, on a par with biological questions, is (still) controversial for two reasons. On the one hand, despite the large body of evidence collected by social epidemiology and sociology of health, the causal, proximate nature of social factors requires more conceptualization. On the other hand, it is not obvious to establish which actions should follow from such conceptualization.

The general point I tried to establish is that questions in philosophy of medicine and in the health sciences (e.g. ‘what are health and disease?’) are not independent from questions in (public health) ethics or political philosophy (e.g., ‘how much should we regulate food industry?’). They are not independent because the way in which we conceptualize health and disease will promote some values rather than others - and it is in this sense that the paper attempts to add to the vast and important literature on value-ladenness the idea that concepts are *value-promoting*.

Which values to promote is a question to be asked continuously during the scientific and policy process, and not just after the fact, only after the sciences and policy interventions have been (shown to be) laden with values that could and should have made explicit since the beginning.

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