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Towards an interspecies health policy : great apes and the right to health

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1. Interspecies health: linking humans, animals, and the environment

The One Health (OH) concept emerged at the start of the 21st century. This perspective on health policy emphasizes the links between humans, animals, and the environment. Moreover, it calls for a multidisciplinary approach of complex health problems.

This chapter will explain why we need to consider the OH concept as a normative proposal. In addition to its objective to promote collaboration between various health professions and to gain a better overview of the ecological and interspecies relations relevant to health, the underlying motivation to not only protect but also to promote health involves values which determine whose health matters, hereby affecting how OH as a concept is understood and operationalized.

If OH does indeed involve values, this raises issues concerning its meaning and justification. Firstly, what does OH involve? To what extent is it possible to agree on its nature in the face of a pluralism of values? I argue that we must find common ground at the empirical level. Although values are paramount in shaping OH policy, it is possible to discern four (largely descriptive) features. This observation, in turn, contributes to clarifying one's own value assumptions pertaining to the operationalization of OH, as this procedure requires an explicit selection of relevant connections between humans, animals, and the environment.

Secondly, how do we justify a OH policy? This issue, I argue, also calls for a search for common ground, albeit explicitly normative in this case. Cutting across national as well as species boundaries, thereby affecting distribution of health resources in the process, discussions on OH surprisingly lack any systematic considerations of justice. In this regard human rights, especially the right to health, provide us with an interesting lens. For, they represent basic entitlements of justice and thus a potentially common ground positioned between otherwise disparate normative viewpoints. Conversely, an interspecies and ecological perspective on health policy could affect our understanding of such basic entitlements. In addition to this interplay, a rights perspective opens up an inquiry into a truly interspecies health policy by means of broadening the scope in order to reach beyond humans.

Considering our close evolutionary history, great apes perhaps provide the strongest challenge to human exceptionalism. The Great Ape Project (1993) asserts that great apes are relevantly

similar to humans rendering them eligible for entitlements of basic justice. If humankind has a right to health, do great apes share this entitlement?¹

1.1 One Health: linking humans, animals, and the environment

The OH concept can be traced back to the publications presented by Calvin W. Schwabe (1927-2006), the renowned veterinary epidemiologist. During the second half of the 20th century, he advocated not only a more integrative perspective on health but also collaborative efforts between human and veterinary health (Schwabe 1964). This view has been summarized as follows, “both sciences share, as a general medicine, a common body of knowledge in anatomy, physiology, pathology, and the origin of disease in all species” (Zinsstag & Schelling 2011: 149). The tenets of this comparative outlook on health can be found in earlier publications e.g., by the physician-*cum*-anthropologist Rudolf Virchow (1821-1902), a key figure in the development of modern pathology (Schultz 2008). However, the cooperative effort between human and veterinary medicine can perhaps be better described as One Medicine.² The OH concept explicitly places human and animal health against the background of their shared environment. In that sense, it delivers an ecological perspective on public health (Lang & Rayner 2012; Coutts, Forkink & Weiner 2014). Therefore, while One Medicine would point towards the ability of certain pathogens to jump species, their zoonotic trait, OH will take an upstream approach, fleshing out those ecological factors which lead up to transmission of pathogens causing disease. In that sense, OH understands humans as well as animals to be an inextricable part of ecosystems. This recognition of the interplay between individual health and the environment has its historical precursors, too, going back for example to the writings of Hippocrates (Barrett & Osofsky 2013).

Nonetheless, it was only at the start of the 21st century, when facing an upsurge of emerging infectious diseases, that the OH concept acquired a strong foothold. In 2004, the Wildlife Conservation Society made an effort to convene relevant partners in order to discuss this threatening increase stating that “recent outbreaks of West Nile virus, Ebola hemorrhagic

¹ Presentation and discussion at several EurSafe conferences has greatly benefitted this chapter (Nieuwland & Meijboom 2015; Nieuwland 2016; Meijboom & Nieuwland 2018). Moreover, this chapter has informed a policy advisory report written (in Dutch) by Franck Meijboom and me (2017) at the request by the Dutch Association of Bioethics (NVBE).

² The celebrated Canadian physician Sir William Osler (1849-1919) allegedly coined the term “One Medicine” (Zinsstag & Schelling 2011: 149).

fever, SARS, monkeypox, mad cow disease, and avian influenza remind us that human and animal health are intimately connected. A broader understanding of health and disease demands a unity of approach achievable only through a consilience of human, domestic animal and wildlife health — One Health”.³

In order to inform health policy, the “One World, One Health” approach was officially established in 2004, together with the so-called Manhattan principles. These principles mainly focus on the integration of wildlife health with livestock population health and with public health. In 2008 an endorsement of the OH concept was forwarded by the American Veterinary Medical Association (AMVA), describing it as the need for a “collaborative effort of multiple disciplines - working locally, nationally, and globally - to attain optimal health for people, animals and the environment” (King et al. 2008). In due course, the United Nations endorsed the OH concept through the “The FAO-OIE-WHO Collaboration: Tripartite Concept Note” (2010), involving in addition to the UN organizations World Health Organization (WHO) and the Food and Agricultural Organization (FAO), the World Animal Health Organisation, formerly the Office International des Epizooties (OIE).

The OH concept spans a wide range of factors, whereby a great deal of how it is understood and operationalized appears to boil down to zoonotic diseases i.e., pathogens with the ability to jump from animal species to humans causing disease as well as other threats associated with animals (Lapinski et al. 2015). Considering the fact that an increasing threat of emerging infectious diseases has played a remarkable role in the development and endorsement of OH, this specific focus does not come as a surprise. The trigger for discussing OH still echoes in current understandings of this concept.

The onset of the OH concept includes a lesson to be learned. Faced with an impending, serious threat (e.g., emerging infectious diseases) one may be forced to abandon time-honored opinions and procedures executed in a business as usual manner. OH furthered cooperation in due course and managed to find its way to the levels of international health policy. Paradoxically, if OH had caught the imagination of health professionals decades earlier, several issues that currently define OH in practice would perhaps not have existed to the

³ <http://www.oneworldonehealth.org> [accessed 5 June 2019].

degree they do now.⁴ Rather than managing the risk of infectious disease emerging against the backdrop of an increased human-wildlife interaction and of the loss of biodiversity and forest fragmentation/destruction, an ecological and interspecies perspective on human health could have ushered us towards implementing systematic changes to our interactions with the natural world. Therefore, while OH provided an urgently required broadening of health policies in the face of emerging infectious diseases, it also focused our attention on these threats, hereby potentially obfuscating other relevant aspects (Stephen 2014).

Having acknowledged OH at several levels (e.g., determining (inter)national health policies; shaping the curricula of medical sciences and professions (Gibbs 2014a), the question: “What does OH exactly involve?” becomes relevant. In order to grasp the nature of OH, as I will discuss below, we need to acquire a clear understanding of the associated values. Prior hereto, it is helpful to distinguish between various OH features that are rather value neutral. The OH concept involves certain empirical claims. No matter your personal normative worldview, everyone could agree to OH entailing at least four factors which, after discussing them, I will bring to bear on the values at play.

1.2 Interspecific threats

Zoonotic diseases played an important role in the development of OH, signifying the obvious relevance of human-animal relations to public health. Human health can be particularly vulnerable to infectious diseases caused by pathogens such as highly pathogenic avian influenza virus, Ebola virus, and SARS-CoV (Daszak et al. 2000). It is no coincidence that these examples are zoonotic with a wildlife origin. The majority of emerging infectious diseases are indeed zoonotic (Taylor et al. 2001). Almost 75 per cent of the zoonotic emerging infectious disease events have a wildlife origin (Jones et al. 2008). The development of antimicrobial resistance in animals (e.g., pigs) is yet another case of a substantial threat to human as well as to animal health (Landers et al. 2012). The transmission of these resistant bacteria to humans could lead to infections no longer susceptible to any antimicrobial treatments.

⁴ The links between biological domains are central to the “bioethics” concept as coined in 1970 by the American biochemist Van Rensselaer Potter II (1911-2001). This concept was overshadowed, much to his disappointment, by means of a rival account which emphasized the relation between the individual patient and the health professional, embedded in a clinical setting (Have 2012). In this sense, One Health follows up on Potter’s proposal by not only reconnecting the dots but also by acknowledging the interdependence existing across biological domains.

The impact of an infectious disease outbreak can be extremely far-reaching, not only involving above all the tragedy of human victims but also for instance economic loss, political instability, and the culling of large numbers of animals (The World Bank 2010). The effects of, for example, the Ebola outbreak of 2014 in West Africa are pervasive and disruptive throughout the struck regions, negatively affecting the lives of those residing here until this very day. In 2017, UNICEF wrote: “As hope grows in West Africa due to decreasing Ebola infections, there are many obstacles to overcome; devastated health care systems, loss of education and distressed social structures face all those who have lived through the Ebola outbreak”.⁵

The undeniable significance of emerging infectious diseases in relation to human health has spurred research interest into wildlife. One of the main research questions for the scientific community in the face of the Ebola outbreak in West Africa was: Where exactly did this virus originate from? The current body of knowledge points towards fruit bats belonging to the *Pteropodidae* family as the likely natural source of Ebola Zaire, the strain responsible for the outbreak during 2014.⁶ As yet, however, numerous questions concerning the Ebola outbreak, and its disease ecology, remain unanswered.

Infectious disease outbreaks underline the relevance of the human-wildlife interface, thereby sparking research into wildlife as well as bringing other options to the table. On occasion, impending health threats stemming from wildlife are addressed by means of culling strategies (Degeling et al. 2016). Vaccination presents us with an alternative means of managing or controlling wildlife health in the light of the threats they may impose on public health. The threat of rabies which foxes imposed across Europe, for example, has been successfully eliminated by way of an oral vaccination strategy (Cliquet & Aubert 2004). In addition to interfering with the animals themselves either by culling or vaccination, wildlife could also play a part in early warning systems just by living their lives. Within such a system, instead of merely viewing them as potential threats to public health, animals are regarded as sentinels serving humankind (Rabinowitz et al. 2008).

Whether animals are indeed potential sources of infectious pathogens or rather reflect an impending threat to human health, these are all ways of seeing animals in terms of human

⁵ https://www.unicef.org/emergencies/ebola/75941_76129.html [accessed 30 October 2017].

⁶ <http://www.who.int/mediacentre/factsheets/fs103/en/> [accessed 30 October 2017].

health; animals either threaten human health or function as a warning of threats to human health (Hanrahan 2014). Whereas OH interconnects the health of humans and animals against the backdrop of a shared environment, nowhere in its DNA does it necessarily involve a human-centered manner of viewing animals. We could also look into interspecies relations from the perspective of wild animals.

The above-mentioned is especially relevant if we take a closer look at great apes, non-human hominids, including gorillas (*Gorilla gorilla* and *Gorilla beringei*), orangutans (*Pongo pygmaeus*, *Pongo abelii* and *Pongo tapanuliensis*), and chimpanzees and bonobos (*Pan troglodytes* and *Pan paniscus*) (Nater et al. 2017).⁷ From an evolutionary perspective, the phylogenetic divergence between humans and great apes is a relatively recent phenomenon, especially if pertaining to chimpanzees, bonobos, and humans (Kuhlwilm et al. 2016). This in part explains the reciprocal susceptibility of hominid species regarding disease transmission (Harper & Zuckerman 2013). The Zaire ebolavirus, for example, is a zoonotic pathogen, that originates from a wildlife reservoir which imposes a threat to both great apes and humans.⁸ Simian immunodeficiency viruses (SIVs) in chimpanzees only become a threat to humans if they evolve into the human immunodeficiency virus referred to as HIV-1 (Harper et al. 2013). Reverse zoonotic diseases, or “anthropozoonoses,” take a different route, as they are threats to the health of great apes originating from humans. The measles virus and respiratory viruses e.g., the Human metapneumovirus (HMPV) can jump from humans to great apes directly, with a potentially devastating impact (Palacios et al. 2011). The human-great ape interface thus involves various serious health threats either way.

Pathogens prominently interconnect the health of humans and animals. As indicated above, this observation need not be focused on threats to human health or interests. The OH concept merely indicates the potential threats to health resulting from interspecies interaction. Furthermore, pathogens need not define OH. The health of humans and animals is related in other ways as well. The three additional features I will discuss below all coherently take OH beyond its focus on interspecific health threats.

⁷ All non-human hominid species are either endangered or critically endangered. <https://www.iucnredlist.org/search/grid?query=Great%20Apes&searchType=species> [accessed 5 February 2020].

⁸ The four other species of the genus *Ebolavirus* are the Bundibugyo ebolavirus, the Sudan ebolavirus, the Reston ebolavirus and the Taï Forest (Ivory Coast) ebolavirus. <http://www.who.int/mediacentre/factsheets/fs103/en/> [accessed 7 September 2018].

1.3 Interspecific benefits

An exaggerated focus on disease works to discern other relevant features. Take for example the increased interest in wildlife in terms of the threats to health they might harbor, where apparently “much wildlife health work focuses on the detection and response to infectious or parasitic diseases; this perspective has been reinforced by the focus of the One Health initiative on wildlife as sources of emerging infections” (Stephen 2014: 427). The OH concept may contribute to a framing of wildlife as possible threats, hereby not only instilling fear of wild animals but also shaping wildlife research according to a disease-centered understanding of health. Viewing wildlife in terms of disease threats may affect the way in which wildlife is managed: “It is right to have standards to prevent the spread and impacts of pathogens, but this should not be confused with the objective of promoting wildlife health” (Stephen 2014: 429).

Thus, a focus on disease could obfuscate the way in which we can promote health. This insight provides us with a second OH feature. Acquiring a comprehensive overview of interspecies relations points out the likely threats as well as the potential benefits to health whereby a difference in approach is reflected: protecting health pertains to threats, whereas the promotion of health looks for conditions that support health. If OH strives to achieve optimal health for all, as suggested by means of the above discussed definition presented by the American Veterinary Medical Association, the promotion of health would complement its protection.

It has been suggested to expand upon the potential of OH beyond interspecific threats to health: “One Health is not limited to the prevention of zoonoses; it also encompasses the human health benefits from animals. Benefits to humans include animals used in the production of food for human consumption, animals as models for research of human diseases, and pet-assisted therapy” (Hodgson & Darling 2011: 189).

To complement the negative impact of animals on human health, such as when resulting from zoonosis, the term “zooeyia” has been proposed in order to signify the human health benefits that are the outcome of either the interaction with or the use of animals. However, similar to the bi-directional nature of threats to health between species, benefits may also accrue regarding animals. OH involves, as is argued, a “two-way affair” (Sandoe et al. 2014). Taking this line of reasoning further, I propose we should also consider the term “anthropoeiyia”

when referring to the health benefits to animals that follow from their interaction with humans.⁹

What are the health benefits of interspecies interaction? The examples which Hodgson and Darling mention explicitly involve the varied utilization of animals to human advantage. Human-animal interactions are understood respectively in terms of consumption, knowledge-generation, and therapeutic intervention. Hodgson and Darling also deal with how animals benefit the health of their human companions, which may even include positive effects on cardio-vascular diseases and mental health.

Establishing the benefits of interspecies interaction is not a straightforward matter. The correlation between better cardio-vascular functioning and having a dog as a companion may not reflect a causal relationship. Based on the available literature, the American Heart Association carefully states: “Pet ownership, particularly dog ownership, is probably associated with decreased CVD [cardio-vascular disease] risk” (Levine et al. 2013: 2356). If companion animals do indeed provide health benefits instead of perceived contribution to well-being has been questioned (Herzog 2011).

Whether or not, and to what extent, dog ownership decreases the risk of developing cardio-vascular disease is not the issue at stake here. The point is: could interspecies interaction perhaps be a way in which human health could be promoted? Animals are inextricably part of human societies, rendering interspecies interaction a possible social determinant of health. According to the World Health Organization (WHO), the social determinants of health are:

the conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels, which are themselves influenced by policy choices. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries.¹⁰

⁹ For a discussion on whether or not benefiting from the health of other non-human animals involves any ethical issues, see 3.1 (below).

¹⁰ http://www.who.int/topics/social_determinants/en/ [accessed 24 October 2017].

Recognition of the social determinants of health opens up new ways of looking at animals. While OH first and foremost emphasized the role of animals with regard to emerging infectious diseases, it also provides a framework to look at the possible health benefits not only of human-animal interaction but also information on the extent to which social determinants of health are shared. This fact prompts research into hypothesized health benefits of interspecies interaction, the outcome of which could inform policy measures aimed at promoting health at the level of social determinants (Rock et al. 2015). So, interaction with animals could thus represent a social determinant of health for humans and vice versa.

Furthermore, rather than representing a social determinant of health for the other, humans and animals might also share certain social determinants of health. For example, the extent to which obesity in humans and animals may have certain determinants in common has been explored (Sandoe et al. 2014). This information could well be of great help to not only acquire a better grip on the relevant factors at play but also to develop effective measures hereby addressing this threat to health which is aimed at both humans and their animal companions.

Another OH feature pertains to the transfer of health knowledge across species boundaries. The example of obesity highlights the shared determinants of health among humans and animals, thereby generating knowledge that could benefit all involved. This event requires an understanding of the differences between species and how they affect knowledge. The first two above-mentioned features emphasize the causal relations between human and animal health placed against the background of a shared environment. Does interspecies interaction involve either threats or benefits to health? However, OH also has an epistemic dimension. To what extent do species boundaries affect a shared perspective on health? This question characterizes the following OH feature: the epistemic challenge of integrating and employing health knowledge across species boundaries. This aspect becomes especially relevant when animals themselves are considered possible sources of knowledge to benefit human health.

1.4 The epistemic challenge

The first two features which concern, respectively, threats and benefits, clearly show how animals are relevant to human health and vice versa. While much of the OH concept revolves around interspecies health threats, we have seen no reason to exclude possible health benefits

from human-animal interaction, whereby a comprehensive overview of threats and benefits to health of interspecies relations is provided.

How does the involvement of animals in research fit into this? Hodgson and Darling (2011) have already pointed out the benefits that might accrue from animal experimentation.

However, in my opinion, the issue of animal experimentation points to another distinct OH feature that deserves attention, namely the epistemic challenge of an integrative perspective on health. Protection and promotion of human health is the primary objective of much animal research, hereby transforming animals into models that hypothetically reflect human physiology and pathology. Within these scientific practices, human health relates to animal health in a comparative rather than causal way. The aim is to generate knowledge by means of animal models in order to benefit human health.

Animal research is less prominently part of the OH discourse when compared to zoonotic diseases, which is indeed surprising. Granted, the links between human health and animal health are comparative rather than causal, a difference that should lead us to exclude the former. Upon consideration, both bring out relevant interconnections between humans and animals albeit in different ways. The extent to which human health policy relies extensively upon animal models resonates very well with the way in which the OH concept strives to flesh out the interconnections between health and disease across species.

Instead of viewing animal research as merely an element of OH, it should be considered a major part of current interspecies health policy. If animal research does indeed contribute to human health, its influence cannot easily be overstated. The involvement of animals is pervasive throughout human medicine, as it is regarded a necessary precursor to clinical trials carried out on humans. Virtually all human medication and medical technology requiring a clinical trial has been tested on animals. A comparative approach to human and animal health is thus deemed vital to human medicine if looking at both the institutional design as well as the flow of resources.

Another reason for OH to be conscious of the comparative approach pertains to its basic premise: the usefulness of animal models to successfully and meaningfully mirror human afflictions. OH is renowned for integrating human and animal health, with a reference to similarity and reciprocal vulnerability. In bringing together various species in an approach to

health it is, however, just as important to comprehend, investigate, and underline interspecies differences:

Yes, animals and humans share traits such as the susceptibility to be infected by viruses and the presence of hearts that are susceptible to diseases. But these are merely surface commonalities or traits manifest on the gross level of examination and hence do not imply the same mechanisms, natural history, or etiology of a disease. Deeper examination reveals that the mechanism by which a virus such as HIV infects the cell differs dramatically among species, as does the resulting illness. (Greek 2012: 562)

We have observed that a shared phylogenetic history between, for example, hominin species is highly relevant in determining zoonotic and anthroponotic threats to health. Humankind has relatively recently, considering the evolutionary history of animals, branched off from other apes. The resultant relative similarity in terms of genotype and phenotype is sufficient for humans and great apes to both not only suffer from Ebola virus disease but also for great apes to be highly susceptible to common human upper respiratory tract infections. While animals, especially great apes, may resemble humans in many ways, complex biological differences could stand in the way of extrapolating knowledge from animals to humans. This fact presents a serious challenge to a comparative approach aimed at the protection and promotion of human health by means of relying on animal models.

Researchers have very often immediately turned to great apes in order to acquire knowledge concerning human health. Nevertheless, reasons to seriously question this unilateral pathway are:

(a) the significant ethical objections to utilizing great apes for both invasive and non-invasive studies. This concern is underlined by the legal prohibition regarding such research imposed in Austria, Germany, the Netherlands, New Zealand, Sweden and the United Kingdom with for example the United States to follow suit (Knight 2011).

(b) as indicated above, serious epistemic questions are related to the predictive value of animal models for human diseases in pre-clinical research. Great apes share a relatively recent common ancestor with humans. However, they differ significantly in their protein expression which explains why systematic reviews of research carried out on chimpanzees queries the

usefulness of such research (Knight 2011). Reliability as well as the predictability of animal models as to human diseases and medical treatments have been questioned in principle because of: (a) an interspecies difference (LaFollette & Shanks 1996; Shanks et al. 2009; Akhtar 2015) and (b) in practice, by means of systematic reviews and the evaluation of the methodological quality (Pound & Bracken 2014; Knight 2011). If these concerns are valid, the acquisition of optimal human and animal health requires us to move away from animal models towards alternative ways of pharmaceutical development and pursuits of advancements in medical technology. This event will of course improve the health of animals and, as has been argued, may (i) protect humans from any harm in terms of unpredicted side effects, (ii) benefit them by means of potential therapeutics left undiscovered and (iii) avoid any inefficient funding (Akhtar 2015).

(c) establishing the goals of health research to prevail in terms of human health, hereby reflecting certain assumptions concerning the moral status of humans and the value of health, possibly obfuscating other pathways of knowledge transferal. The empirical possibilities of a comparative approach reach beyond a unilateral interest in human health (Capps & Lederman 2016). It is beneficial to first establish these possibilities before operationalizing a comparative approach in accordance with a certain set of values and other normative assumptions.

An interspecies perspective on health will disclose the relevance of similarity while simultaneously identifying dissimilarities which require more species-specific approaches. In full awareness of any interspecies differences, one could carefully explore interspecies benefits. Diagnostics applied when determining human mental health, for example, could inform the health monitoring of great apes (Ferdowsian et al. 2013). However, disentangling interspecies difference is equally vital in order to promote health. It has been reported that whereas all hominids suffer from heart diseases, the underlying causes differ when comparing humans with the other great apes. This observation prompts the question: “Why do humans not often suffer from the fibrotic heart disease so common in our closest evolutionary cousins? Conversely, why do chimpanzees not have the kind of heart disease so common in humans?” (Varki et al. 2009). Such questions usher us towards an interspecies health policy rather than a human-centered one.

To sum up the epistemic challenge, I advocate that animal research falls under the heading “One Health” for the ways it infers and presumes health knowledge across species. Moreover, it is pervasive in human medicine and many resources flow into it. Further, a key element of OH is highlighted that affects other areas as well, namely the epistemic challenge of transferring knowledge across species boundaries. The OH concept acknowledges the similarities as well as the reciprocal susceptibility between humans and animals but should also be attentive to relevant differences. By providing an interspecies perspective on health, the OH concept should encourage investigating the epistemic value of animal models in order to benefit humans as well as animals, and vice versa. Again, as with the case of interspecies threats and benefits to health, OH serving as a descriptive approach should highlight all the relevant pathways of knowledge transferal across species. Based on specific values, one may subsequently determine the justified operationalization of a comparative approach to health. The current direction of benefits and costs pertaining to animal research reflects certain moral assumptions which may not survive scrutiny while obfuscating other pathways of knowledge transferal across species boundaries.

1.5 The ecological challenge

As discussed at the beginning of this chapter, OH goes beyond the One Medicine concept by explicitly positioning the interconnections between human and animal health against the background of their shared (natural) environment. Nonetheless, several authors on OH voice their concern about the lack of attention paid to the ecological dimension (Zinsstag 2012; Barrett & Bouley 2014). How did it come to this?

One Health highlights human-animal dependency and vulnerability in terms of health, emphasizing similarity between the two. Ecological processes on the other hand does not resemble them. Whether or not ecosystems are healthy in a metaphorical or literal sense is much less straightforward if compared to individual humans and animals. The ecosystem health concept has attracted both adamant supporters and critics (Callicott 1995; Jamieson 1995; McShane 2004), paralleling the vexed debate on the intrinsic value of nature. At the academic level, such controversial concepts could push attention inwards rather than outwards, thus resulting in complex theoretical debates that fail to affect public policy (Minteer 2011).

Ecological negligence could prove to be detrimental for several reasons. Changes to the environment may play a key role in the emergence of infectious disease (Patz et al. 2004). If one does not engage with the ecological background of disease emergence to primarily focus on the transmission of diseases between humans and animals, any subsequent measures aimed at protecting health could very well prove to be inadequate, symptomatic and incomplete. I will illustrate this point by distinguishing between a biomedical and an ecological take on the Ebola virus disease outbreak (see 1.8, below). For now, the main issue concerns: the management of zoonotic diseases should engage with the underlying ecological drivers in order to obtain a comprehensive overview of such a threat and its influence on human and animal health.

Nevertheless, emphasizing ecological drivers that underlie disease emergence still remains too limited a representation of the environment. The supporting role of ecosystem functioning in relation to human and animal health is lacking here. Moreover, ecosystems not only benefit human and animal health in terms of the services they provide, they are fundamental in the sense that they represent necessary conditions for health (Holland 2008). When outlining the relevant links, human health inevitably relies on clean water, breathable air, pollination, fertile soil, stable climate, etc. Although ecological dependence of one's health could very well lose its pertinence in daily life, ecological determinants of health are essential to supporting human health and life.

Perhaps some worry that such a through-out ecological perspective takes the OH concept too far hereby transforming it into an all-encompassing framework containing all things health-related. This objection, however, is itself question-begging. Why would it be a problem to include the ways in which human and animal health are supported by means of ecosystem services? Moreover, if these considerations were to be excluded, we might indeed arrive at profoundly inadequate and symptomatic ad hoc solutions. When taking OH to its logical consequences, we should understand animal health (including human health) from a socio-ecological perspective (Zinsstag & Schelling 2011; Stephen & Karesh 2014). Social and ecological factors together make up the fabric of our shared environment, affecting individual health in numerous and diverse ways.

If the various biological domains are interconnected and brought to bear upon each other, as I have argued is indeed the case, then a wide array of incoming issues arise for health

professionals to deal with. In that sense, OH confronts the veterinary profession, which has perhaps pushed the OH agenda most adamantly (Gibbs 2014b), to not only forwarding these issues but also to engage with the implicit background considerations. This is work to be done, as “(m)ost of the fundamental social and environmental determinants of health, such as water security, biodiversity, climate change, social justice, equitable access to resources, pollution and land use planning, have remained beyond the scope of most One Health programmes, despite their profound impacts on human and animal health and welfare” (Stephen & Karesh 2014: 377).

This broad array of factors points to another reason for the underrepresentation of the environment. If you do engage thoroughly with the ecological side of things, all kinds of incoming issues are introduced. Your area of expertise is suddenly interconnected with “fundamental social and environmental determinants of health” (Stephen & Karesh 2014: 377) transforming straightforward situations into challenging ethical conundrums. Considering the demandingness and complexity of the determinants of health mentioned above, it is perhaps no surprise to anticipate that these issues are sidestepped in practice, hereby of course restricting OH significantly.

Therefore, OH provides us with an ecological perspective on health, which results in all kinds of new considerations. Attempts to restrict the scope of OH and thus sidestep any ecological concerns appear to raise further questions. I myself do not see how interspecies and ecological determinants of health (i.e., those respectively associated with disease emergence as well as ecosystem services) can be excluded from OH consideration.

The four angles on the nature of OH (interspecies threats, benefits resulting from human-animal interaction, epistemic challenge, ecological challenge) serve a twofold purpose. First, it aims, at a descriptive level, to specify OH slightly more beyond the manner it is usually formulated in rather general terms. These four angles together present us not only with a coherent specification of an interspecies but also with an ecological perspective on health. Second, these features could also contribute to explicating any underlying values. Which threats have grabbed our attention, and which should? Whose health should be promoted? Which medical technology should we make available to individuals of other species? How should we deal with our shared ecological backdrop? Until now I have merely focused on the

above-mentioned angles without engaging with these underlying values. It is time to look at OH as a normative proposal.

1.6 The normative challenge

One Health involves an empirical perspective on health, namely that animal and human health (a) can be vulnerable to diseases originating from other species, (b) might benefit from certain interactions with other animals, (c) could be improved by generating knowledge that applies across species boundaries, and (d) are inextricably meshed with ecological processes. These four features necessitate the collaboration between scientific disciplines in order to acquire a fully descriptive overview of the relevant factors that affect health.

One Health also involves values and has been described as “the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals, and our environment” (King et al. 2008). One Health is not only a call for breaking down the boundaries between scientific disciplines. The integration serves a purpose, as the American Veterinary Medical Association puts it, “to attain optimal health for people, animals and the environment”. Needless to say, the question is: what does this involve? Which values inform the achievement of optimal health (Hanrahan 2014)? Although the understanding of OH is normative, its generality allows for plenty of room for interpretation.

The aforementioned features are a way to specify the rather general understanding of OH in order to then facilitate a collaboration between scientific disciplines. In a similar spirit, I argue that any values involved need to be made explicit. What does it mean to attain optimal health? As stated above, in my view, these two kinds of specifications are synergetic. A better understanding of the empirical, descriptive OH features contributes to reveal the presupposed values at play. Conversely, the awareness of one’s values can help to explain how one grasps OH and its implications.

Values can shape one’s comprehension and especially one’s operationalization of OH. For example, an emphasis on zoonotic diseases primarily reflects a concern with human health. Based on the value of human health, OH is shaped accordingly. One’s focus could even be much smaller, for example, when health policy is mainly aimed at protecting and improving the health of one’s fellow citizens. In this case there is perhaps no need to invest in any

pharmaceutical developments concerning diseases which only citizens of other nation-states are vulnerable to whenever an outbreak occurs. This outcome could result in measures which disadvantage other humans, who are not members of that particular society. Or, to take a radically different perspective, animals may be considered the moral equals of humans, citizens even. Subsequently, OH will involve a more equal concern for human and animal health.

One Health is not inherently linked to a specific set of values, but it inevitably involves certain values. If one does not discuss the underlying values, OH operationalization may fail to reflect any values which, after due consideration, would be deemed correct. One Health not only shapes the curricula of health professionals but also informs the health policy at various levels, both national and international (Gibbs 2014a). It is therefore of great importance to highlight the manner in which its significance depends upon evaluative assumptions. In that sense, it mirrors the way sustainability generates societal appeal while lacking unequivocal meaning. Still, precisely “because of the very breadth of the notion of sustainability and its popular appeal, this language has the potential to structure discourse between people who have quite different values and epistemologies ... If parties to a dispute can agree that sustainability matters, then arguments will turn on the meaning of sustainability and how various policies contribute to its realization” (Jamieson 1998: 10).

One Health and sustainability offer the opportunity to bridge discourses at the level of policy, whether they are defined either by scientific discipline or an ethical outlook. Once these concepts guide action and policy, it becomes especially important to better understand their meaning and implications. To avoid the OH concept becoming meaningless, we must discuss how it relates to values. As part of this endeavor, we will have to (a) recognize OH as a normative concept which comprises not merely breaking down the barriers of scientific disciplines and fostering collaboration; the efforts of this concept are geared towards goals which need to be traced back to values, (b) reflect upon these specific values that inform OH and subject them to scrutiny. Are these values indeed those we support upon reflection? (c) ideally, embrace a health policy shaped by OH in sync with the values we hold dear.¹¹

¹¹ The concepts of politics and policy are respectively defined as “the activities associated with the governance of a country or area, especially the debate between parties having power” and “a course or principle of action adopted or proposed by an organization or individual”, see en.oxforddictionaries.com [accessed 11 September 2018]. The present thesis engages with both the political and policy issues. In terms of politics, an interest-based

Let us now examine a statement concerning the objectives of OH in order to pick out these different levels: “Whereas some may view One Health as having a singular end goal of optimizing human health, we emphasize here that the maintenance and improvement of animal health and ecosystem functioning are also primary goals of One Health, with their own inherent value separate from their impact on human health” (Barrett & Osofsky 2013: 365).

The non-instrumental value of animal health and ecosystem functioning is highlighted in order to ward off any full-blown anthropocentrism. This action affects the OH goals. However, it also requires an explanation or justification of the values professed. Whereas Barrett and Osofsky aim to present a description of OH, they also provide content to its normativity by taking a particular ethical perspective, albeit rather general. Why should we acknowledge the value of animal health and ecosystem functioning as having their “own inherent value separate from their impact on human health”? In spite of disputing certain current moral norms and values, they merely challenge them by providing their personal viewpoints without disclosing any further argumentative support. This is the launch of a discussion rather than its conclusive endpoint.

Considering the plurality of values people may endorse upon ethical reflection, dissension is to be expected. Here the perpetual disagreement between moral philosophers is a case in point. This phenomenon need not be problematic, if you consider a discussion on values as a valuable itself. Perhaps it is merely relevant to highlight the various sets of values that could inform OH in order to prevent a non-reflective attitude being implemented to OH in practice. Rather than ending the quest for an ethical framework to once and for all steer moral actions (which is indeed not unique to OH) ethics require taking a step back to reflect upon how your values inform OH.

A number of moral values attract less debate than others, maybe even to the point they belong to the values we hold close to our hearts. Human rights may be among them, a thought I will further explore (see 1.7, below). Rather than revealing the differences between normative perspectives, recognizing the normative OH goals also presents us with opportunities to provide content to these goals by means of the values we hold dear. In other words, we should

human rights framework will be discussed here. When applied to great apes, this discourse will, in my opinion, lead to the inception of a genuine interspecies health policy.

make an effort in order to not only highlight the differences in our ethical viewpoints but also to search for a common ground and then shape health policy accordingly.

1.7 A universal rights perspective

If OH aims at attaining optimal health for humans and animals against the backdrop of ecological interdependency, what does this entail specifically? Value assumptions as to everything optimal health involves often remain implicit. This could prove to be problematic, if these values are either not justified or do not reflect what we genuinely believe to be of value. This is the reason why we need to single out the values shaping OH in practice and at the level of policy to then subject them to reflection. Should we go any further and explore a clearly normative outlook with respect to OH?

Such a shift may be both possible and plausible. Dissent concerning values will be inevitable in many OH discussions, in particular with respect to the moral status of non-human animals. However, human rights imply a moral standard less subject to controversy. Furthermore, a range of political, ethical, and theological justifications supports such entitlements (Nussbaum, 2006), which imbues those rights with a pragmatic relevance to health policy. Despite a wide array of worldviews, many agree that human rights involve the basic entitlements of individuals to live a minimally decent life (Ashford 2007). I wish to take this stance seriously within the OH context.¹²

Setting off from the premise of human rights could have significant implications for OH. Considering a further exploration hereof, it is helpful to look into the concept of sustainable development. In the fourth quarter of the 20th century, various ecological events led to concerns for the natural environment and the way it supports human life (Carson 1962). In 1983 this apprehension was sufficient for the United Nations to establish the World Commission on Environment and Development which is now known as the Brundtland Commission. It issued a report entitled “Our Common Future” in which the concept of sustainable development is actively encouraged. Sustainable development is defined as the “Development that meets the needs of the world’s poor without compromising the ability of

¹² I will defend the plausibility of an ethical justification of human rights, specifically the interest-based account of moral rights in the course of this thesis (see chapter 3, section 1-2). At present, the scope of human rights is regarded as a credible normative reference point.

future generations to meet their own needs”.¹³ Sustainable development links a concern for those disadvantaged by poverty with a concern for the environment (Jamieson 1998).

Meeting the needs of the current poor and future generations is understood as a rather stringent requirement: “The most fundamental norm proposed by Brundtland was that every person has a fundamental human right to live in an environment adequate for their health and wellbeing” (Hayward 2009: 282). The objectives of sustainable development were forwarded in terms of human rights, making these objectives a matter of basic justice. Humans should, as a matter of rights, not live in severe poverty or be deprived from vital ecosystem services. This statement sounds reasonable and compelling. It is nonetheless easy to overlook the implications of such a claim, as:

The achievement of this right, for every person would involve a more radical transformation of global relations than seems to be supposed in most discussions of sustainable development. For it cannot be achieved without also achieving a range of basic social rights; yet the environment also sets constraints on economic activity in the aggregate, and thus on the generation of the wherewithal to fulfill those rights. Considering the conditions of possibility of its achievement would thus suggest a profound challenge to the system of private property rights which allows some to draw immense profit from the world’s natural resources while others are deprived of even the basic necessities of life. (Hayward 2009: 282)

If we really believe that humans are entitled to an environment including sufficient quality to support his or her personal health and well-being, in addition to right not to live in poverty, a profound system change is required. At any rate, currently, we are utterly failing to live up to such convictions. Moreover, as Howard points out, such beliefs challenge the numerous other beliefs that shape our institutions e.g., the ability to own private property and consume natural resources beyond what could reasonably be considered sustainable in terms of the definition forwarded by the Brundtland Commission.

Acknowledging the basic entitlements of humans entails significant challenges to our current institutions and way of life. Nevertheless, one could argue that sustainable development is not

¹³ <http://www.un-documents.net/ocf-02.htm> [accessed 1 October 2018].

sufficiently anthropocentric in practice, as the current use of natural resources deprives many humans from the necessary environmental conditions for retaining their health and well-being (Hayward 2013a). Moreover, a fact humans in developed countries may not notice in their day-to-day experience concerns the fact that their reliance upon ecosystem services in support of their health is already threatened at various levels (McMichael 2009). The consumption of natural resources therefore disproportionately disadvantages humans populating developing countries, while simultaneously undercutting the ecological conditions for human health in developed countries in the long term.

Human rights provide a lens that is reasonable and compelling in terms of the vital human interests at play, whereby at the same time a challenge in terms of its demands unfolds. Of course, the concept of human rights has been criticized (e.g., Geuss 2001). However, those who agree on the fact that these rights impose a reasonable threshold level of justice will have to consider the sweeping implications of such basic human entitlements for sustainable development.

How does this translate to OH? Similar to OH, value assumptions shape both the understanding and the operationalization of the sustainable development concept. It is pointed out that “While those who were most concerned with poverty could emphasize the word ‘development’ in the Brundtland formulation, environmentalists could just as well emphasize the word ‘sustainable’ (Jamieson 1998: 183-4). The same applies to OH; as we have seen in the present chapter, OH may transform its color and shape depending on the profession and values of each individual.

The OH concept furthermore shares with sustainable development an ecological outlook on the health of humans, albeit more comprehensive by including interspecies interactions and relations. Whereas sustainable development did, for instance, underline the importance of biodiversity, OH more explicitly includes animals in all shapes and sizes, irrespective of any contexts, hereby causing interspecies relations to become an integral part of health policy.

The approaches differ with respect to human rights. Where sustainable development was grounded in a concern for human rights, discussions on human rights are not at the forefront of OH action or policy. The Manhattan Principles, for example, do not mention human rights as a normative reference point for OH and surprisingly nor does the 2010 FAO-OIE-WHO:

Tripartite Concept Note¹⁴ (OIE, Food and Agricultural Organization, & World Health Organization 2010), considering this collaboration comprises a joint endorsement of OH by the Food and Agricultural Organization and the World Health Organization, both specialized UN agencies, together with the World Organisation for Animal Health (OIE). In general, OH rather abides by pursued objectives: it is understood to serve as a call for multidisciplinary collaboration in order to achieve optimal health for humans, animals, and the environment.

I argue we should observe OH as being an ecological and interspecies challenge to public health policy, rather than a mere call for multidisciplinary collaboration. This challenge is not the outcome of tearing down the existing silos or disciplines between research practices (albeit challenging in itself) but the result of taking the ecological and interspecies determinants of health seriously and bringing them to bear on human rights. I do not see how the original objective of the Brundtland Commission i.e., protecting the natural environment to the extent it provides the conditions necessary for the health and well-being of humans) could somehow lack any relevance when considering the OH concept. Achieving optimal health within the OH framework would then entail that humans have a right to protect their health not only at the level of the natural environment but also with regard to relations with other species.

In addition to the endorsement of human rights by the Brundtland Commission, there is yet another reason why human rights are relevant to OH. Although the OH scope appears to be limitless, it does indeed concern health primarily. One Health sketches the interspecies and ecological relations upon which human health depend, hereby informing policy directed at such determinants. Health is not the only issue affecting human lives, but it does signify a special value. Humans often have a wide range of wishes, ambitions, and desires but these do not all impose stringent moral demands on others, let alone any demands of justice. Health is different and special, according to certain thinkers (e.g., Daniels 2007; Venkatapuram 2013; Nielsen 2014). What makes it so important to these political philosophers? They all argue that health is essential in the way it enables humans to live their lives according to their personal values and ambitions. Health provides individuals with a certain range of opportunities, which may be subject to considerations of fairness and equality. This characteristic of health has led

¹⁴ http://www.who.int/influenza/resources/documents/tripartite_concept_note_hanoi/en [accessed 1 January 2018].

to postulations implying we should safeguard a certain level of health functioning in order to create equal opportunity for all (e.g., Daniels 2007; Nussbaum 2006).

Humans only have access to a specific range of opportunities if they are healthy, which by and large depend upon health policy. Individual health can be protected and promoted in many ways, prompting, among others, the following questions: do individuals have access to adequate health care? To which level does a socio-economic status correlate with health outcomes? Which factors contribute to one's health agency, thus providing individuals with the ability to take decisions on their personal health? These kinds of questions cover various determinants of health, hereby reflecting the broadening of the relevant considerations pertaining to health justice beyond the access to adequate health care.

Ecological determinants of health have remained on the periphery of public health, to only be surpassed by the lack of attention for interspecies relations. One Health apparently points out what one could refer to as the ecological and interspecies determinants of health, all of which are potential objectives for measures aimed at protecting and promoting health. In this manner, OH deals with health policy whereby concerns of justice are triggered. Moreover, a further dimension to the social determinants of health is added, highlighting the ecological and interspecies factors.

The question is: how should we configure our relations with other animals against the backdrop of a shared environment in order to safeguard individual human health? Needless to say, this is a general issue requiring specification according to a particular context. Our relations with other animals are intricate. Answering this question therefore requires ample empirical data. Importantly, of course, it also involves values. Determining, for example, the cut-off points as to whether or not implement the measure of culling of certain animals cannot be executed within the confines of descriptive science alone (Degeling et al. 2016). Thus, in order to determine how to configure human-animal interactions, we will have to unite relevant empirical information and the values we deem significant.

Apparently, as a result of the above discussion, the following two reasons prompt us to take human rights seriously within OH. First, by means of: (a) comparing OH to sustainable development in order to underline the need for a human rights perspective. The original acknowledgment of human rights by sustainable development then follows from recognizing

the environmental conditions necessary for human health. One Health also establishes the connection between human health and the environment, even venturing further by explicitly including animals and interspecies relations, without utilizing the language of human rights. I argue that the OH concept is relevantly similar to sustainable development in its ability to shape health policy. If we therefore take human rights seriously when pertaining to sustainable development, we should do likewise as to OH informed policy.

Second, (b) by looking at the characteristics of health itself, as they are discussed within the philosophical debate of health justice. Various political philosophers acknowledge health as special as it enables individual humans to pursue a reasonable range of opportunities. Furthermore, health is dependent on external factors, ranging between access to health care and other social determinants e.g., socio-economic status. I argue that whenever we view the above-mentioned determinants to be not only morally relevant, but also even to be matters of justice (as they determine the content of a just health policy) we should also need to consider the weight we attribute to ecological and interspecies determinants of health, all of which fall within the purview of OH.

What does taking human rights seriously in the operationalization of OH imply? If we limit ourselves to human entitlements, as discussed above, a critical viewpoint regarding our current interactions with other animals has already been delivered. Considering for example livestock production, in very general terms, its impact on ecological processes is quite staggering as it contributes among other things substantially to global warming by means of emissions (Steinfeld et al. 2006), forest fragmentation and destruction (Patz et al. 2004), decrease of biodiversity (Cardinale et al. 2012), inefficient use of nutrients compounding food insecurity and inequality (Fanzo 2015), and an increased risk of the emergence of infectious diseases (Jones et al. 2008). In addition, in the light of OH and interspecies relations, noteworthy risks are associated with keeping large numbers of animals relatively close to each other (Akhtar 2012).

Considering the documented impact of livestock production on various ecological processes of biodiversity, a system modification appears required in order to safeguard human health.¹⁵

¹⁵ The ecological ramifications of intensive livestock farming also touch upon the discussion on human population growth and the pressures on ecological systems. For instance, we read in the Brundtland Report sub

It has been advocated that, in order to improve public health, we should start improving the way animals are treated. As Akhtar (2012: 8) states, “The emergence of many recent pathogens can be attributed, directly or indirectly, to the intensive confinement of animals raised for food and the poor treatment of animals appropriated for the wildlife trade. The strategies currently used to address EIDs would be much improved if efforts to improve the treatment of animals were integrated into public health policies.” Such a broad and multispecies outlook fits seamlessly together with OH. Furthermore, the focus on the impact on human health rather than on the interests of animals themselves fits in with the strategy to not only adopt human rights as a reference point but also to avoid any controversy regarding the moral value of animals. Akhtar does not discuss human rights, hereby taking the moral importance of human interests more or less as an established fact. From a human rights perspective, one might argue for the even more demanding claim: humans have the right not to be subjected to interspecies configurations that impose serious threats to their health, a line of argument I will flesh out in chapter 5.¹⁶

To summarize, in accordance with the Brundtland Commission, I assume the human right to having an environment capable of supporting one’s health to be plausible. If humans have rights based on their interest to live a minimally decent life, this therefore includes the protection and promotion of health, the degree of which needs to be specified. Starting off from this right, I furthermore claim that humans have the right not to be subjected to configurations of interspecies relations that impose serious threats to their health. These claims follow from taking human rights seriously within OH understanding and operationalization.

We now will look the outbreak of Ebola virus disease in West Africa, 2014-2016, affecting Guinea, Liberia and Sierra Leone, to explore a multispecies perspective on health policy. I will first discuss the lack of vaccines offering protection against this virus as well as why this plight should be viewed as a human rights issue. Many critical issues can be raised concerning the response of the international community and the shortage of vaccines. However, we

Point 41: “In many parts of the world, the population is growing at rates that cannot be sustained by available environmental resources, at rates that are outstripping any reasonable expectations of improvements in housing, health care, food security, or energy supplies”.

¹⁶ When discussing animal research, Akhtar (2015) postulates we do harm humans by continuing to rely on animal models in pre-clinical research in which distributive concerns (i.e., pertaining to how we shall distribute the available resources and who is to benefit) and an epistemic concern (i.e., do animal models contribute to human interests?) are involved.

should also pay attention to the underlying drivers of disease emergence. To that effect, the emphasis which OH places on ecological and interspecies determinants of health is particularly relevant.

1.8 The 2014 Ebola virus disease outbreak in West Africa

The Ebola virus disease outbreak (subtype Zaire) in West Africa, which emerged in December 2013, sadly demonstrates a failure at various levels to address a serious threat to human health. The outcome of this nonfulfillment comprises:

(a) the behindhand response delivered by the international community represented by the UN World Health Organization. Médecins Sans Frontières had not only been active at the forefront of this Ebola virus disease outbreak since March 2014 but had also repeatedly urged the international community to become involved, without any immediate effects. Only months later, on August 8, did the WHO declare the Ebola virus disease outbreak to be a public health emergency of international concern, providing the much needed momentum in order to “unlock funding and activate expert capability faster”.¹⁷ This belated response from the WHO to the evolving outbreak reflects a failure of health policy at the level of international institutions, as the WHO itself has acknowledged (Moon et al. 2015).

(b) the absence of a vaccine against Ebola virus disease. Needless to say, this predicament restricted the ability to protect individuals at risk, contain an outbreak, and treat those infected. Considering the first occurrence of Ebola virus disease in 1976, the number of outbreaks during later decades, and the voiced concerns about its pandemic potential, it is quite remarkable that no vaccines had been developed at the time of the Ebola virus disease outbreak in West Africa (Karan & Pogge 2015).¹⁸ This situation is all the more disconcerting when taking into account that the intense efforts the research community made in order to develop a vaccination at very short notice in response to the outbreak were apparently met with success (Huttner et al. 2018).

Pharmaceutical incentives may explain the unavailability of vaccines. For, “Had there been significant Ebola outbreaks in affluent nations rather than in Sub-Saharan Africa in the past few decades, we would likely have an arsenal of medications in stock today” (Karan & Pogge

¹⁷ <https://www.msf.org/ebola-pushed-limit-and-beyond.html> [accessed 1 October 2018].

¹⁸ <https://www.cdc.gov/vhf/ebola/outbreaks/history/chronology.html> [accessed 6 July 2017].

2015). Pharmaceutical developments appear the result of financial incentives rather than health needs. This phenomenon is also the reason why Karan and Pogge voice their doubt concerning the prospects for those most in need of vaccines and medical treatment against Ebola virus disease in the long run: “while the current epidemic has spurred a new race to develop Ebola vaccines and treatment regimens, the current patent system makes it unlikely that people in the most afflicted nations will have access to such vaccines or medications when they are brought to market without the assistance of development aid initiatives from the United Nations (UN), World Health Organization, the GAVI Alliance and other multinational global entities” (Karan & Pogge 2015).

The lack of attention for the health needs of humans affected by Ebola virus disease reflects an injustice. Institutions and regulations disadvantage those already disadvantaged. The way they are set up impedes the protection of human rights. Correcting this requires a restructuring in accordance with the demands of basic justice. Human rights question these institutional configurations because they fail to meet critical health needs. This is unfair to those who are disadvantaged by this specific institutional set-up. Karan and Pogge argue that this Ebola virus disease outbreak in West Africa and the lack of vaccines illustrate that we need to restructure the pharmaceutical developments in order to enhance its ethicality. Instead of forwarding some other incentive, Karan and Pogge also argue the need for establishing a Health Impact Fund, which allocates resources on the basis of meeting health needs.

I endorse these viewpoints. Institutions should reflect the most basic requirements of humans, formulated in human rights. Taking these rights seriously results in a critical appraisal of the current institutions, hereby frequently pointing towards change at a fundamental level. On the one hand we have Hayward who explains how the human right to an environment ends up probing the limits of property ownership. On the other hand, Karan and Pogge challenge the currently institutionalized modus operandi pertaining to pharmaceutical developments.

In order to better protect human health in the face of any emerging infectious threats, while acting in accordance with human rights, we must address the capacities of immediate response and preventive action. Implementing OH in a manner that primarily benefits people in developed countries reinforces inequality. Whereas Ebola virus is obviously a OH topic, from a human rights perspective, the issue is now: how to best protect the health of all

humans involved? It is unfair to uphold institutions and regulations geared towards the health needs of the well-off, both in case of emergency response and pharmaceutical development.

How does this relate to the four features of OH, to wit, interspecies health threats, interspecies health benefits, trans-species knowledge transfer, and the ecological perspective which have all been discussed and introduced above. In this case, of course, considering that Ebola virus comprises a zoonotic pathogen, the relevance of interspecies threats, the first above-mentioned feature, is obvious. However, in addition to the devastating impact on humans, Ebola virus disease also affects non-human species (Thompson & List 2015). With fruit bats as the suspected source, Ebola virus can be transmitted to other mammals including species of duikers and of Hominidae (great apes).¹⁹ Albeit difficult to establish the impact of such infectious diseases in the wild, indications point towards certain great ape communities being decimated by the introduction of Ebola virus (Ryan & Walsh 2011). Moreover, if great apes are hunted for bush meat, humans could perhaps be exposed to Ebola virus in the process of slaughtering their catch. In fact, this route has triggered several smaller Ebola virus disease outbreaks in the past.²⁰ Therefore, in order to get a full overview of the Ebola virus threat, we need to include non-human species as well. Considering the potential threat of zoonotic disease transmission from apes to humans, any incoming policies should for example strive at minimizing human-ape interaction, hereby including an enforced prohibition on the hunting of great apes for bush meat and pet trade (Walsh et al. 2003).

Nevertheless, even if measures to discontinue hunting activities prove successful, minimizing human-ape interaction remains a challenge. Various graded human influences increasingly characterize landscapes (Hockings et al. 2015). Several great apes live in close vicinity of human dwellings, on occasion to the effect of them raiding crops or entering villages (Krief et al. 2014). These events touch upon yet another angle on OH, to wit, the health effects accruing from interspecies interaction. This situation calls for an assessment of the interactions between humans and great apes. Evidently, hunting activities impose an imminent threat to the health of great apes. In addition, this and further examples of habitat encroachment may also entail other, more indirect, negative effects, for instance, by triggering stress and socio-behavioral transformations. Prolonged stress could decrease the functioning of immune systems, rendering individuals vulnerable to other health threats (Klailova et al.

¹⁹ https://www.unicef.org/emergencies/ebola/75941_76129.html [accessed 30 October 2017].

²⁰ <https://www.cdc.gov/vhf/ebola/outbreaks/history/chronology.html> [accessed 6 July 2017].

2010). Hence, OH requires an assessment of the social-ecological context which humankind and animals share to then safeguard the socio-ecological determinants of health.

And, as indicated above, in order to provide full protection against the Ebola virus threat, we also have to develop vaccines. Considering that great apes are also endangered, we could wonder whether we are obliged to protect them against the Ebola virus threat. It is argued that OH provides us with an opportunity to look into the threat imposed by infectious diseases from a shared perspective (Capps & Lederman, 2015). Protecting humans against Ebola virus disease could go hand in hand with conservation objectives, when observing the impact it has on great ape communities (Leendertz et al. 2017). If we were able to protect these communities against Ebola virus disease by means of vaccination, this would then entail a reduced risk to human communities.²¹

Let us now return to the issue of pharmaceutical development and its relation to health needs. As we have seen, Karan and Pogge (2015) compellingly reveal the injustice regarding the way in which pharmaceutical developments are geared towards benefitting those residing in the developed world. However, should we not look beyond species boundaries in the critical appraisal of the history of the development of vaccines against Ebola virus disease? While highlighting those humans most vulnerable to a pandemic, Karan and Pogge do not mention the susceptibility of great apes to Ebola virus infection. In an effort to create a more justifiable configuration of institutions in order to reflect pressing health needs, Karan and Pogge overlook the interest of great apes. The predominant financial incentives of pharmaceutical developments do indeed hugely distract from human health needs, leading to an inequality between humans whereby the health interests of other hominids are obfuscated too.

If we next address the third feature of OH i.e., the ability of knowledge transfer across species, a genuine interspecies overview of the Ebola virus unravels. Although the utilization of great apes in medical research is practically banned (see chapter 7), in the face of imminent threat with the magnitude of the likes of Ebola virus disease, one may turn towards great apes as animal models again (perhaps even with the additional argument of benefitting the apes in the process of doing so (Edwards et al. 2018; Capps & Lederman 2015)), thus bringing up the challenge of generating knowledge to be applied across species boundaries.

²¹ Whether or not we should vaccinate great apes in the wild against diseases (e.g., Ebola virus disease). The reason for choice will be addressed in chapter 7.

The issue of developing a vaccine to protect against Ebola virus disease presents us with the following considerations: is it ethically permissible to use (a) great apes in medical research in order to protect humankind against Ebola virus disease? and (b) great apes (e.g., chimpanzees) in medical research in order to protect other chimpanzees living in the wild against Ebola virus disease?²²

Human rights provide an interesting starting point to address these issues. The Great Ape Project (GAP), instigated by philosophers Paola Cavalieri and Peter Singer, also sets off from human rights to next explore our interactions with other non-human hominids. Despite taking human rights as a normative reference point, their enterprise has since 1993 challenged the human-centeredness of human rights. If humans are entitled to basic justice because of being human, then how does this translate to non-human Hominidae? The GAP does not disagree with human rights. In fact, it assumes the legitimacy of those rights while striving to broaden its scope primarily because of a similarity between humans and other hominids in genetic as well as cognitive terms. Equality also applies to great apes, as they are relevantly similar to humans. Moreover, it places the burden of proof on those who restrict the scope of human rights to humans only primarily because of species-membership.

Whether or not the GAP succeeds partly depends on how one conceives human rights. Perhaps humans significantly differ from other animals in a manner that attributes rights to the former while withholding them from the latter. References to dignity, for example, may single out humans as being exceptional in moral terms, which passes the buck, because now one could ask why dignity is reserved only for humans (Nussbaum 2006; Tasioulas 2014)? The GAP appears to have a case in point when highlighting similarities and discrediting the moral relevance of any remaining differences between humans and great apes.

The GAP has proposed three moral rights: the right to life, the right to liberty, and the right not to be tortured. These are basic rights, in the sense that justice may require even more, and negative rights, in the sense they mainly impose duties of restraint on others. I will investigate these rights more closely in the course of the following chapters to then argue they must be specified according to an interest-based theory of moral rights.

²² Note that the epistemic challenge is much less substantial for chimpanzees living in the wild as the same species are concerned.

At present, we must realize that these rights do not contribute a great deal to informing a health policy in shared human-ape landscapes other than diminishing the impact of human action on the lives of great apes. To what extent should we accommodate the needs of great apes in these situations? Or, do the interests of humankind override the interests of apes with the exception of, to put it bluntly, killing, capturing or torturing them? While the GAP ambitiously aims at extending basic rights to non-human hominids, it is somewhat self-effacing when proposing its gamut of rights. This attitude leads to a discrepancy if, as discussed above, human rights play a role in not only devising a just health policy regarding any pharmaceutical developments but also supporting ecological conditions pertaining to health, when the set of moral rights of great apes is limited to the three above-mentioned rights as the GAP proposed.

If great apes have negative rights because they resemble humans in morally relevant ways, does the same reasoning not also apply to positive rights, too? Although the scope of human rights, especially positive rights, is controversial and subject to intense philosophical debate (O'Neill 2005; Geuss 2001), the range of human rights may very well encompass more than the three moral rights the GAP proposes. In the following chapters, I will not only discuss the human right to health but also the extent to which it should include ecological and interspecies determinants of health and whether it should pertain to great apes as well.

Looking into the Ebola virus disease outbreak from an ecological perspective – the fourth feature of OH – and disentangling the underlying drivers of disease emergence, the importance of an such a perspective becomes apparent:

The Ebola epidemic in West Africa is not merely a biomedical problem that can be seen in isolation and dealt with only through emergency medical rescue processes. The ethical dilemmas surfaced by this epidemic are also not confined to the usual micro-ethical problems associated with medical care and medical research. The pandemic, as one of many manifestations of failed human and social development that has brought the world to dangerous 'tipping points', requires deep introspection and action to address upstream causal processes. (Benatar 2015: 1)

A OH perspective on the outbreak of an infectious disease, in this case Ebola virus, would see to an investigation of the underlying ecological drivers (Capps & Lederman 2015; Thompson

& List 2015). Whereas such outbreaks happen haphazardly, and are thus difficult to predict, a number of relevant risk factors have been reported e.g., recent deforestation (Olivero et al. 2017). All manifestations of deforestation and of the encroachment of wildlife habitats contribute to more interaction taking place at the human-wildlife interface, which heightens the risk of pathogens jumping over species boundaries (Patz et al. 2004). Human health, being dependent upon ecosystem services, is vulnerable to ecological disturbances (e.g., deforestation, a decrease in biodiversity). Importantly, a large number of these disruptions are economically driven. The goal pursued by local communities in order to escape from poverty reinforces the goal of (inter)national business to be profitable; a combination of these two factors often profoundly impacts the ecosystems, creating a downward spiral. Next, the ecological consequences of such economic forces, to wit, a loss of biodiversity and/or an increased chance of the emergence of infectious disease, often jeopardizes the lives of those already disadvantaged (Bausch & Schwarz 2014).

In order to get a grip on the outbreak of emerging infectious diseases, we thus need to research the interplay between ecology and economy.²³ As has been pointed out: “Poverty drives people to expand their range of activities to stay alive, plunging deeper into the forest to expand the geographic as well as species range of hunted game and to find wood to make charcoal and deeper into mines to extract minerals, enhancing their risk of exposure to Ebola virus and other zoonotic pathogens in these remote corners” (Bausch & Schwarz 2014: 4).

Such a chain of events illustrates how an ecological and interspecific perspective on health facilitates numerous other considerations, not least of all those pertaining to human rights. Poverty forms a major cause of ecological devastation. And, the lack of health care affects not only those without any access hereto but also the chances of containing outbreaks.²⁴ The threat of emerging infectious diseases urges a critical evaluation of emergency response capacity as well as pharmaceutical developments. However, if we see the Ebola virus disease outbreak primarily as a biomedical problem, we fail to take its underlying drivers seriously.

²³ Indeed, this again emphasizes the overlap between the concepts of sustainable development and of One Health.

²⁴ Furthermore, if a human is infected with a zoonotic pathogen, the lack of an adequate health care infrastructure increases the chances of a full-blown outbreak (Bausch & Schwarz 2014). This outcome places the impoverished at a double risk, as they are exposed to the danger of a zoonotic disease being provided without the access to an adequate medical care. Bausch and Swartz further report that the absence of any adequate governance in the face of a potentially large-scale outbreak makes matters even worse.

That is the reason why a “One Bioethics” has been advocated, to deconstruct the barriers between environmental philosophy and biomedical ethics (Thompson & List 2015). Indeed, taking an upstream approach to the vulnerability of health includes breaking down barriers for instance between environmental ethics on the one hand and biomedical ethics on the other. However, a narrow disciplinary focus may on occasion be appropriate, for example, when comprising the emphasis of biomedical ethics on the importance of consenting to medical treatment. Sub-disciplines of applied ethics overlap and inform each other in many ways (Verweij & Bovenkerk 2016).

Nonetheless, viewing the outbreak of Ebola virus disease primarily as a biomedical problem is especially problematic as it affects basic entitlements of humans, such as freedom from poverty and the access to basic health care. It is not just ethics, but justice that must be understood against the background of ecological processes and interspecies relations. If we accept human rights as a normative standard, we also need to determine the demands of human rights in the light of OH as well as their scope: do only humans have such basic entitlements?

1.9 Concluding remarks

The OH concept involves in general terms a call for collaborations between various health professions in order to not only recognize but also address the links between humans, animals and the environment to then achieve optimal health for all. Notwithstanding this praiseworthy aim, it proves to be problematic considering its vagueness, especially if not subjected to scrutiny in practice. Despite this broad definition, OH for the major part engages with threats to human health, for example, zoonotic diseases or antimicrobial resistance. To avoid this limited starting point pertaining to OH, I suggest distinguishing between the following four features whereby (a) interspecific threats, (e.g., zoonotic diseases) form a single feature and involve the protection of health, (b) interspecies relations are beneficial in terms of health outcomes; other than protection, as this result involves health promotion, (c) human health is viewed alongside animal health against a shared environment which allows for comparative approaches, giving rise to epistemic concerns: to what extent can health knowledge be applied across species boundaries? and (d) OH places health against the background of ecological processes, extending it beyond a mere cooperation between human and veterinary health professions.

In combination, the above-mentioned features contribute to further integrating health considerations across species boundaries, help to gain insight into complex health problems and prevent misunderstanding pertaining to the meaning of the concept. Furthermore, they can serve to explicate values. For example, if one only looks into zoonotic threats, the direction of a threat (moving from animals to humans) could well reflect anthropocentric values. Conversely, overlooking certain ecological concerns, however distal they may be, could reveal a bias towards a certain group of humans to the possible disadvantage of others. These values need to be justified, especially as OH gains more and more influence on health policies, triggering questions of distributive justice; who should cooperate with whom and working towards which goal?

Whereas both a debate on the values at play and the awareness of disagreement is important, recognition of the normative assumptions of OH also allows for opportunities to search for common ground. I have indicated the potential of human rights to function when taking on this role, especially as considerations of justice are currently lacking in the majority of descriptions of OH. Moreover, if one acknowledges human rights as basic entitlements of justice, to then apply it to the OH framework, we must reevaluate the demands of such entitlements much in the same manner that sustainable development has demanded in relation to its original understanding. If humans have a right to living a (minimally) decent life, this involves certain assumptions regarding ecological processes upon which they rely for their health and well-being. The OH concept goes even further when highlighting interspecies relations as determinants of health. In addition to the claim of having access to an environment of sufficient quality to support one's health and well-being and to living a life of (minimal) decency, humans should just as well acquire the right to a configuration of interspecies relations that protects and promotes health.

As discussed above, human rights reflect basic entitlements that provide a lens to evaluate institutions. The 2014-2016 Ebola virus disease outbreak demonstrated a failure by the international community as to responding adequately and in time. Moreover, the shortage of vaccines demonstrated a failure of pharmaceutical developments and institutions to protect individual human health, as the Ebola virus disease threat had been well-known for decades. In addition to these concerns, we should understand that such outbreaks are not just a biomedical issue, but also thoroughly ecological. The recognition of interdependency, both

interspecies and ecological, opens up all kinds of new considerations, not least of all those pertaining to basic human entitlements such as to be free from poverty.

In addition to these concerns, understanding the protection against diseases such as Ebola virus disease in terms of human rights may be overly anthropocentric, all the more because great apes as well as humans can fall victim to such diseases. Following the GAP, great apes are relevantly similar to humans in terms of genetic makeup and cognitive terms, which puts pressure on the concept of human rights being restricted to humans only. If we were to accept this premise, and its implications, the three basic rights declared by the above project still remain rather minimal, thus prompting the question: do great apes have a right comparable to the human right to health as has been tentatively sketched in the present chapter? Before taking up this question, we have to start bottom-up, beginning with the moral status of non-human animals.

