



Stamping Out Animal Culling: From Anthropocentrism to One Health Ethics

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Abstract

Culling is used in traditional public health policies to control animal populations. These policies aim primarily to protect human interests but often fail to provide scientific evidence of effectiveness. In this article, we defend the need to move from a strictly anthropocentric approach to disease control towards a One Health ethics, using culling practices as an example. We focus on the recent badger culls in the UK, claiming that, based on data provided by the English Government, these culls may be unjustified, all things considered. We highlight the relevance of ethical reasoning rooted in One Health for this discussion, and make several suggestions including a moratorium on culling until data are provided to support the effectiveness of culling; to conduct a randomized trial to compare proactive culling with alternative methods; to apply deliberative democratic methods to assess public opinion towards the culls, and to find in Brexit an opportunity for aiming for more effective control measures.

Keywords Culling · One Health · Badgers · Practical ethics

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Introduction

One Health (OH) is a biomedical approach or even a social movement described as an interdisciplinary effort to improve the well-being of humans, animals and the environment (AVMA, 2008). It has been a focus of the international scientific community since the early 2000's, in light of zoonotic disease outbreaks H5N1 and Severe Acute Respiratory Syndrome (SARS), and has been espoused by multiple professional organizations such as the American Veterinary Medical Association, the World Health Organization and the American Centers for Disease Control (Kahn, 2017; King et al., 2008; Lederman & Degeling, 2019; Rabinowitz et al., 2013; Rubin, 2013; Zinsstag et al., 2011, 2012).

While there is some debate regarding the advantages and disadvantages of OH compared to other approaches such as EcoHealth or Planetary Health (Harrison et al., 2019; Lerner & Berg, 2017; Rabinowitz et al., 2018; Zinnstag, 2012), here we treat them as similar approaches, and restrict our discussion to OH. OH includes the following areas: management of zoonoses, environmental toxicants, health and disease at the human-animal-environment interface (such as the effects of climate change on human and animal health), comparative medicine, food safety and security, and animal assisted therapy (Lederman & Rabinowitch, 2014; Rabinowitz & Conti, 2012). Authors have lamented the traditional siloing of biomedical and clinical disciplines, and advocated for OH as an interdisciplinary or multidisciplinary effort to optimize biomedical research and clinical medicine, both in humans and animals (Capps et al., 2015; Deem et al., 2019; Kahn et al., 2010; Manlove et al., 2016; Rabinowitz & Conti, 2010; Spencer et al., 2019). Indeed, increasing evidence supports biomedical research which is informed by a OH approach (Rabinowitz et al., 2013; Wirblich et al., 2017). Similarly, authors have urged to integrate OH into clinical medicine (Davis & Mahr, 2010; Lederman et al., 2020; Rabinowitz et al., 2007, 2018) and called to include OH in medical schools and colleges curricula (Kahn et al., 2008; Lederman, 2017; Rabinowitz et al., 2017).

Bioethicists and social scientists have also embedded themselves in OH discussion and analysis, focusing on the ethical implications and dilemmas that such a holistic, integrative approach engenders. Some of these ethical issues, in relation to the structural configurations of disease and participatory epidemiology (Capps et al., 2015; Degeling et al., 2015) are merely emphasized, while some issues are novel, at least in the bioethics and philosophical literature (Capps & Lederman, 2015a, 2015b; Edwards et al., 2018; Lederman & Capps, 2020; Lysaght et al., 2017). For example, despite the zoonotic nature of the Ebola Virus Disease outbreak, authors have highlighted how the bioethical debate that followed was mostly anthropocentric, overlooking environmental ethics or even presenting a skewed image of zoocentric concerns (Thompson & List, 2015). Following the principles of the OH movement, these authors suggest 'One Bioethics' as a more inclusive bioethical framework. Having bioethicists collaborate and deliberate with biomedical professionals from both the human and animal sciences may bring to the fore novel insights and questions for the rigorous examination of

current common practices. While the notion of ‘One Bioethics’ is intriguing, and the authors’ call for interdisciplinary collaboration is well-justified, their proposal lacks a clear definition of the term as well as concrete recommendations or actual analyses of the impact and implications of One Bioethics for these common practices. Here we critically discuss culling as one such common practice, and we do so from a OH perspective.

The Ethics of Culling

Animal culling is one of the main public health policies, used extensively as a population control measure for various reasons, including human safety, conservation or for disease control. In particular, hundreds of thousands of animals on average are killed each day throughout the world to control outbreaks of zoonotic diseases. These animals may be wild, farm or urban, and they may be killed for the protection of humans or other animals (e.g. cows during Foot and Mouth Disease outbreak in the UK (Woods, 2004)). Other than direct harms to the animals killed, culling is extremely costly, and may be harmful to humans in indirect ways. As such, it requires a rigorous scientific and ethical scrutiny, which until recently has been scarce (Barteling & Suttmoller, 2003; Palmar & Ulbrich, 1997).

Consider the use of culling for rabies control. Dog bites is one of the most common modes of transmission for human rabies. A survey that was published in 2010 reported that 46 out of 76 countries that are members in the World Organization for Animal Health (OIE) had a policy of killing free-roaming dogs (Taylor et al., 2017). Thousands of stray and free-roaming dogs are still killed yearly in Mongolia (Batsukh et al., 2013; Ward, 2012), Indonesia (Clifton, 2010) and elsewhere for the purpose of controlling rabies (Morters et al., 2013; Ward, 2012), even though vaccine baits were found to be more effective and cost-effective than culling in multiple locations (Brochier et al., 1991; Morters et al., 2013; Taylor et al., 2017). For example, a rabies outbreak in Bali, Indonesia, in 2008 was first unsuccessfully controlled by culling of roughly 108,000 dogs and government-run limited vaccination campaigns. National and international nongovernmental animal welfare organizations subsequently initiated mass vaccination campaigns and managed to control the outbreak. Forty thousand dogs were also culled during these wide vaccination campaigns but it is unclear which stakeholder initiated this (Putra et al., 2013). From a OH perspective, vaccination potentially protects both animals and humans with very little risk, thus embodying a shared benefit approach that takes into account the interests of both humans and animals, and their interconnection (Capps & Lederman, 2015b, 2016; Edwards et al., 2018).

In this paper, we argue that public health policies primarily based on culling fail to adequately consider the interests of those involved other than humans and that we need to move from an anthropocentric approach to disease control towards a One Health ethics. We define an anthropocentric approach as one that solely considers the interests of humans. A OH approach, on the other hand, may be grounded in zoocentric, biocentric or ecocentric outlooks, and would take into account the interests of animals, all living things or the biotic community as a whole (Capps et al.,

2015). To support our argument for basing culling on a OH approach, we examine the ongoing culling of badgers in England to control bovine tuberculosis (bTB), which serves as a prime example of a public health policy that seems overly determined by political factors rather than sound judgment based on science and ethics.

Badger Culls—the Interface Between Politics, Science and Ethics

When considering bTB control in England there is little evidence that culling is effective in the long term or more cost-effective when compared to other preventive measures, such as vaccination, improved surveillance and movement control (Lederman, 2016; McCulloch & Reiss, 2017a). To justify killing animals to control disease one requires strong scientific evidence that it would be effective; from a OH perspective that considers the well-being of animals, it is not enough to just kill them because we think it might control disease outbreaks. Governmental policy in England to control bTB has seemingly been influenced by opposing interest groups: on the one hand using badgers as scapegoats for the spread of bTB and enforcing culling to appease farmers, while on the other trying to find scientific justification for the culls to assuage public indignation engendered by the ostensive inhuman and unjustified culls (Atkins, 2016; McCulloch & Reiss, 2017a; Naylor et al., 2017).

However, it is this second point that is sorely lacking. Indeed, the Randomized Badger Culling Trial (RBCT), conducted during 1998–2006, the largest trial to date which compared no culling with proactive and reactive culling, demonstrated that both reactive and proactive culling are ineffective and/or cost-ineffective in controlling the spread of bTB in England. During this trial specific geographical locations in England were divided into triplets of 10 areas of 100 square km each. Each triplet included three arms: an area where no culling of badgers occurred, an area where badgers were culled in response to a bTB outbreak in cattle (reactive culling), and an area where badgers were culled regardless of bTB outbreaks (proactive culling).

The reactive culling arm was terminated prematurely as English politicians became convinced that culling was ineffective and perhaps even harmful (House of Commons, 2008). The most updated analysis concluded that the proactive culling reduced bTB outbreaks in cattle inside the culling areas by 25.7%, while increasing it by 7.6% in areas spanning two km surrounding the culling areas (Jenkins et al., 2011). The trial also demonstrated that proactive culling is in any case cost-ineffective (Bourne et al., 2007).

This evidence has unfortunately not deterred the English government from continuing to kill badgers, either by shooting them in the open or while in cages. From 2013 to 2017, 34,083 badgers were killed in 21 areas in Dorset, Cornwall, Devon, Gloucestershire, Cheshire, Herefordshire, Somerset, and Wiltshire. In fact, up to 64,000 badgers were expected to be killed in 43 areas in the autumn and winter months of 2019 alone (Carrington, 2019). Why are the badger culls continuing when the available scientific evidence largely predicts that they would be ineffective or cost-ineffective? Badger culling in the UK provides a prime example that public health interventions may not be grounded in science.

Culling also spawns economic controversy. There is no doubt that culling is expensive, which raises the question of whether the costs are outweighed by the reduction in disease incidence. The English governmental agencies are estimated to incur costs of £550,000 per new licensed cull area, over a four-year period (DEFRA, 2016). Similarly, farmers are estimated to incur costs of £865,000 per cull area. The total estimated costs over this four-year period are £2.03 million per area (DEFRA, 2016). In contrast, badger control is estimated to save the English government and farmers around £2.59 million per cull area over a four-year period. Thus, the benefits are expected to be greater than the costs by around £0.56 million, but with considerable uncertainty (DEFRA, 2016).

Looking at disease incidence, the most optimistic model estimates that culling 70 per cent of badgers in a cull area would reduce bTB incidence in cattle within the same cull area by 32.7 per cent during the four years of the cull, and by 38.4 per cent during the next seven years following the cull period. In up to a 2 km radius outside of the cull area, it has been estimated that there would be a 0.6 per cent reduction in disease incidence during the first four years of the cull, and a 31.2 per cent reduction during the next seven years after the cull period (DEFRA, 2016). Even if achieving a 70 per cent reduction in the badger population is plausible, are these disease reductions significant enough to justify the costs? Should they be labeled as 'effective' results?

As in every other topic in public health policy, culling stands at the intersection of science, ethics, culture and politics (McCulloch & Reiss, 2017a, 2017b, 2017d). The insistence on badger culling to control bTB seems to suggest that scientific uncertainty is mostly used to justify existing policies, when it should encourage innovative approaches instead. Alternatively, it suggests that English governments have considered scientific evidence no more significant than any other claims presented by interest groups, which devalues the importance of scientific expertise in public health. In effect, science is not value-free and scientific claims are often imbedded with value-laden assumptions. Scientific uncertainty is more of an epistemological social construct, and various stakeholders often have an incentive in maintaining and emphasizing scientific uncertainty to promote their own agenda. Put differently, scientific uncertainty is often desired and used for political purposes (Jamieson, 1996). Science indeed cannot and should not determine policy on its own, but whenever other factors do determine policy, they should be made transparent.

Defining 'effectiveness' in terms of the ends or desired goals for a given policy likewise entails value-judgment, which cannot solely be left up for science. Deciding whether culling is justified, based on benefits, risks, trade-offs and the values at stake, requires an open and transparent discussion with the relevant stakeholders and engagement with a wide range of expertise. Those in animal studies could assess the moral and symbolic values of the animal that might be culled, and ethicists could present their case on whether culling is justified based on well-accepted public health ethical principles such as necessity and proportionality (The necessity principle states that a morally infringing public health intervention cannot be considered necessary to achieve a public health goal if the same goal can be achieved by an alternative intervention that is less morally problematic. The proportionality principle requires that the infringement of general moral considerations by an intervention

should be proportional to the probable public health benefits of the same intervention (Childress et al., 2002). Local communities could then be invited to help consider the different local normative values involved, and determine the extent to which their own interests should outweigh those of the animals, and importantly whether they may be reconciled through alternative measures. Only then should policy-makers make their decisions and potentially present them to the public to evaluate and support. More participatory democratic processes, where local and national communities themselves determine the local and national policy rather than simply informing politicians of their views, should also be considered.

From Culling to One Health

Using culling as a mainstream solution to public health threats involving zoonotic diseases denotes the anthropocentric position of considering animals and nature as merely instrumental for human flourishing. We do not advocate for the abolition of culling *tout court*, but we oppose culling policies that are not science-based and that ignore the interests of those involved, other than (some) humans.

The OH approach to public health ethics here adopted integrates legitimate human interests with those of animals and ecosystems. It re-defines and expands the scope of ‘public,’ and extends the focus from a public good to a universal good. Traditional public health approaches operate to protect or promote the public good, which consists of concepts like public interest and human rights. The ‘public’ here refers exclusively to some human community, so naturally only human interests are considered in the development and assessments of policies. Human interests are optimized as long as fundamental human interests or rights are not violated (Capps, 2012; Coggon, 2012). Embracing a OH approach, and shifting gears towards the pursuit of universal goods, reformulates the ‘public’ to include all creatures that possess moral worth, which ought to include animals and even plants or ecosystems in particular contexts. Humans interests may then conflict with the rights of some animals, and potentially be outweighed (Capps & Lederman, 2015a; Lederman & Capps, 2020). OH may thus be seen as an extension of public health—an extension that seems long over-due considering the vast philosophical literature advocating the moral status of animals and ecosystems. What this means is that the name of the approach matters less than the normative commitments that drive research and practice towards the optimization of health: whether it be ‘One Health Ethics’, ‘One Bioethics’, EcoHealth or ‘Public Health 2.0,’ the main idea is that humans are not and should not be the sole stakeholders or members of the moral community (McCulloch & Reiss, 2017b, 2017c, 2017d).

But why should we re-consider culling at all from a OH perspective? Because it harms animals, and animals matter morally. At the very minimum, we should avoid causing suffering in animals. Current bTB control policies have been based on cost–benefit analyses that allocate a disproportionate share of costs to animals, both wild and farmed. The most systematic attempt to kill wild animals humanely in the UK has failed, leaving badgers to suffer for unknown periods of time (Munro et al., 2014). One utilitarian ethical analysis considered badger

culling to fare worse than badger vaccination or doing nothing in maximizing utility (McCulloch & Reiss, 2017b).

As to farm animals, a commonly heard argument in favor of preemptive culling is that most of these animals will be killed anyway, for more direct human needs (e.g. food industry). Therefore, there is no extra wrong in painlessly killing them. This argument regarding farm animals is mistaken for at least two reasons. First, farm animals are killed as a public health measure *in addition* to those killed for direct human needs. Since humans will not be expected to eat less meat, we will be contributing to the total amount of lives lost, thus reducing utility and causing animals harm. The two really are independent of one another. If we stop or reduce culling, we save lives, period. Second, killing animals for food is one thing, killing them because we think it might control disease outbreaks is another. The latter requires strong evidence, which does not exist. Worst, some culling practices aim at killing animals that are not at increased risk of disease, for the sole purpose of testing preparedness to react in the event of an outbreak (Lederman, 2016). While pandemic preparedness is important, it does not justify the killing of otherwise healthy animals.

Environmental concerns have mostly been ignored by current badger culling policies (Atkins, 2016) and seem to play a secondary role in bTB societal debate. When present, the debate is often centered upon the total number of badgers culled every year (cf. Badger Trust Website), and little attention is given to the wider effects that such ecological disruption entails. Those effects are magnified by the fact that badgers in the UK are top predators with a knock-on effect on the ecology of entire ecosystems (Trewby et al., 2014). Badger culling not only violates the interests of individual animals but those of nature or ecosystems. From an environmental ethic point of view, badger culling arguably fails to consider the inherent value of ecosystems (ecocentrism) and how the interests of other living beings are affected by the absence of badgers (biocentrism).

Moreover, while badgers are our focus here, infected and un-infected cattle is also being killed because of bTB. Such preemptive culling of cattle, from an environmental perspective, represents a considerable waste of resources, thus adding to the already high environmental footprint of livestock production, and should therefore be weighed against alternative measures (McCulloch & Reiss, 2017b).

It is, however, possible that culling is advocated *because* of environmental concerns when animals are perceived as a threat to other animals and ecosystems. That is often the case of invasive animal species. Although we do not deny that culling may be considered as part of an integrated OH approach, research has consistently shown that culling is mostly ineffective, as in the case of free roaming cats in Australia (Riley, 2019). Additionally, animals destined to be culled are often socially, and sometimes legally, considered invasive, vermin or pest (Cassidy, 2012; Riley, 2015, 2019). When considering the range of roles that animals play in human lives, pests stand in the far end of the continuum of inherent moral value as having little or no value at all. European badgers (*Meles meles*) are native wild animals, quite the opposite of pests. Considering badgers as pests disconnects them from their natural environment, normalizes killing and denies them moral value.

Culling in general also harms human communities, in various ways. First, the environmental disruption of local ecosystems also affects humans. Second, while certain communities perceive certain animals as pests and thus do not object to their killing (Tan, 2017), most local communities would feel connected to the wild and domestic animals living amongst them, and would require strong justification for killing them. In Singapore in 2017, the cull of free-roaming chickens in a housing estate, purportedly to prevent an outbreak of avian flu, was heavily criticized because of the disagreement on the public health rationale, concerns over inadvertent killing of red junglefowl (an endangered species which intermingles with the domestic breeds), and the fondness of these animals among many residents (Tan, 2017).

Several studies have indeed examined UK public views towards badgers and culling operations (McCulloch & Reiss, 2017a, 2017b). By and large, the public opposes the culls, perceiving the badgers as lovable, intelligent, and innocent victims of an irrational political agenda (Cassidy, 2012). A random telephone survey of 402 respondents in 2004 revealed that 83% agreed that badgers are an important wildlife species in Britain, and 73% objected to badger culling. It further revealed that people would agree to channel much of their tax money to prevent the culls (Bennett & Willis, 2008). A BBC telephone survey of 999 people aged 16+ across the UK in 2011 revealed that 63% opposed the cull.¹ In fact, Peter Atkins probably exaggerates only slightly when he states that “the only solid, stable and knowable element of bTB is the public’s opposition to badger culling, which at one point approached North Korean levels of consensus” (Atkins, 2016, p.15). Negative public positions towards badgers, on the other hand, may be confounded by cultural stereotypes perceiving the badger as cunning (Cassidy, 2012). Due to EU trade regulations, farmers tend to favor culling over vaccination or vaccination plus culling (Enticott et al., 2012; Lodge & Matus, 2014; Naylor et al., 2014). At the same time, however, farmers are distrustful of the English government’s benevolence towards them, particularly in cases in which the government is represented by a person who is perceived by the farmers as not ‘one of them.’ (House of Commons, 2008 pp. 40–42; Enticott et al., 2012; Naylor et al., 2014). Researchers have in fact linked the farmers’ favoring of culls with their distrust of the government, claiming that farmers’ attitudes towards vaccination may be easily modified through educational interventions and increased trust in the government (Enticott et al., 2015).

That having said, representing badgers as bTB spreaders probably provides policy-makers (and the general public) with a convenient scapegoat to help explain an extremely complex disease.

¹ <https://www.bbc.com/news/science-environment-13684482>.

Looking Towards the Future

When it comes to culling, data are gravely needed. Science should undoubtedly inform future discussions of the badger culls in the UK and other culls worldwide. We need good data comparing proactive culling and alternative interventions, such as vaccination (rather than culling versus no-intervention), which are best achieved by conducting randomized controlled trials (RCTs). Clearly, such studies would have to extend over a long period of time, and will require great investments of human and financial resources. Further, since a RCT will necessitate the killing of thousands of animals, methodologies should be developed to assess not just the quality of evidence but to balance the interests of and potential long term benefits to humans, animals and ecosystems. Again, such endeavor would be aided by an open and transparent consultation with relevant stakeholders involved. Much like how bio-statisticians should be involved in studies even from the planning phase, bioethicists and experts in animal welfare and ecology should be consulted in the planning of a large-scale culling trial. Social scientists could conduct community engagement and ethnographic studies to gain contextual insights for assessing the acceptability of, and concerns regarding the trial (Bourne et al., 2007, p.41). Plausibly, policy makers may then decide that RCTs are not justified in some cases, and that other types of studies should be employed.

Until additional data that justify badger culling become available, in turn informing whether it is ethically justified as a public health measure, we should declare a moratorium on badger culling. Perhaps the English government should consider moving to a more participatory process of public referendum in its policy-making approach towards badgers. Such a process will take decision-making solely from the hands of politicians and share it with the public, such that public opinion is regarded as a legitimate partner in collaborative policy-making.

Such participatory democratic methods should moderate anthropocentric viewpoints and motivations, and include information regarding the costs of culling and what the expected effects on disease rates in cattle etc. would be. A survey of this sort was done in the past, but was criticized for being selective in the data that were shown (cf. McCulloch & Reiss, 2017a). The English government should be commended for posting the data on the culls on their Department of Environment, Food & Rural Affairs' website, but this may not be sufficient to allow the public to make an informed opinion.

Public health decisions also depend on the wider economic context and, admittedly, the English government is constrained by international trade agreements. While it may wish to do the scientifically and ethically right thing, it must also oblige by EU commerce regulations that necessitate culling of infected cattle and prohibit their vaccination. The stakeholders' beef, in that case, should be with the EU rather than the English government (McCulloch & Reiss, 2017b). Brexit could potentially provide an opportunity for revising the available evidence and aiming for more effective control measures.

Lastly, ethics and the moral status of badgers should take center stage. McCulloch and Reiss rightly state:

“Ultimately, in the final analysis, policy on badger control is necessarily a moral issue that should be analysed in the context of the following question: Ethically, what is the right, or most justifiable policy on badger control, considering impacts on all morally relevant affected groups?” (McCulloch & Reiss, 2017a, p.480). The badgers’ position in the moral community, and what it means from the human perspective, is perhaps the most decisive factor to consider.

Conclusion

One Health, and perhaps other integrated approaches such as ‘EcoHealth’, that treat human health, animal health, and ecological health as elements of the same health management system call for an overall change in our normative attitudes towards animals and the environment. Such integrated approaches have already influenced, and should influence national and international policies and regulations.

One area in which change seems warranted is the culling of farm, companion and wild animals as a public health measure to control zoonoses. No longer should governments and public health officials be allowed to kill thousands of animals without proper scientific, social and ethical justification. From a OH perspective, at least several kinds of culling may hardly be justified as they negatively affect both humans and animals and are not a reasonable public policy.

In this article we have focused on the badger culls in England as an example of such incidence of culling that seems hardly justified. We have first briefly reviewed One Health. We next critically reviewed culling practices, using rabies as an example for scientifically and ethically unjustified culling interventions. Third, we reviewed the history, science and ethics behind the badger culls in England, arguing that the culls are unethical. Lastly, we urge policy-makers to re-consider the moral values or approaches grounding public health policies on culling, in the spirit of OH.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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