



14 Policy and Governance

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Chapter Overview

Elevator pitch

It's important for the application of the One Health approach that there is an enabling environment to facilitate its uptake and implementation. Policy and governance structure across sectors, groups and levels can be varied and have a large influence on the realization of the added value taking a One Health approach can deliver. It is therefore important for the One Health practitioner to understand different governance structures and mechanisms and how health policy is formed.

Book objectives the chapter relates to

- 1. Understand what One Health and Ecohealth mean
- 2. Think in a One Health and Ecohealth way
- 3. Apply One Health and Ecohealth in their professional and personal life
- 4. Know how to share One Health and Ecohealth knowledge
- 5. Integrate One Health and Ecohealth knowledge actively
- 6. Acquire or enhance core One Health competencies

Main One Health competencies covered

- 1. Effective communication
- 2. Collaborative and resilient working
- 3. Systems understanding
- 4. Transdisciplinarity
- 5. Social, cultural and gender equity and inclusiveness
- 6. Collective learning and reflective practice
- 7. One Health concepts
- 8. Theoretical and methodological pluralism

- 9. Harnessing uncertainty, paradox and limited knowledge

After having worked through this chapter, you will have an understanding of governance and policy as relevant to One Health.

Learning outcomes

1. Understand what is meant by governance and policy, and the policy-making process.
2. Be able to identify policy actors and governance structures in One Health.
3. Discuss use of evidence in policy and evidence in informed decision making.
4. Explain aspects of governance of particular relevance to the delivery of One Health.

Summary

This chapter discusses aspects of policy making and varying governance systems to equip the reader with a diverse understanding of policy systems, actors and the policy-making process. It discusses the use of evidence in decision making and how to interact across the science–policy interface. It is important for those looking to further the practice of One Health that they have an understanding of how policies and governance can both facilitate and challenge its implementation.

Note: The first half of the chapter can be read as a continuous section of prose so that the focus is on understanding the underlying concepts and not a case of memorizing facts. This first half of the chapter will explain policy-making processes and governance. The second part of this chapter will take a closer look at the specifics for One Health. Key concepts and terms are highlighted throughout. There are applied examples included to demonstrate the concepts described. Activities are deliberately thought provoking and complex with no right or wrong answer, but some suggested discussion points are included.

14.1 Why is it Important for a One Health Practitioner to Understand Policy and Governance?

One Health practitioners may be directly involved in **policy**, as decision makers or advisers or tasked with designing the governance for One Health institutions or groups. To embed the **One Health approach** into institutions, the principles or rules that are set, or how it will be organized, i.e. the **governance** structures, play a key role in its success. Similarly, when policies are being created, by a government, for example, a One Health practitioner may be needed to make sure there is consideration of all the One Health implications or to identify relevant people to be involved in the policy-making process.

We can group these roles into two sections: (i) the governance **of** One Health and (ii) governance **for** One Health. It is important for those looking to further the practice of One Health that they have an understanding of how policies and governance can both facilitate and challenge its use. The first half of this chapter will explain policy-making processes and governance. The second part of this chapter will take a closer look at the specifics for One Health. Key concepts are highlighted, and there are applied examples given and learning reflection points suggested.



What does Ebola have to do with fishing policy?

Ebola is a thankfully rare viral haemorrhagic disease with a 50% average fatality rate. It is passed human-to-human via direct contact. Outbreaks in humans are thought to re-emerge when people are in close contact with fruit bats, primates or other wildlife (or their bodily fluids) that are a natural host of the virus.

In 2013, the European Union (EU) made changes to the Common Fisheries Policy and arguably contributed to the largest outbreak of Ebola in history, some 5000 miles away in West Africa.

Policy: A 'sustainable fishing partnership agreement' gave European Union member countries fishing rights in third (i.e. non-EU) countries, including West Africa (Fig. 14.1).

The policy, in conjunction with illegal fishing, depleted fish stocks and endangered the marine **ecosystems** (Ifesinachi Okafor-Yarwood, 2020). This led to a reduction of fish available for local coastal villages where locally caught fish represented the primary source of protein for these communities (Khan, 2015).

Coastal communities were then forced to source alternative protein sources, entering the forests and jungles to hunt for wildlife (Fig. 14.2). This 'bushmeat' replacement was an essential source of protein but brought communities into closer contact with wild animal species that were potential vectors of Ebola virus.

In addition, there was increasing deforestation in these Western African countries (Fig. 14.3). Deforestation leads to widespread loss of **biodiversity** and reduces food sources such as fruit. This means animals of different species coming together around those remaining sources, alongside people (Rulli *et al.*, 2017).

The first case of the most recent Ebola outbreak was identified in December 2014 in Guinea (Fig. 14.4). Weak surveillance systems and underfunded public health infrastructure hampered efforts to contain the outbreak and it quickly spread to Guinea's bordering countries, Liberia and Sierra Leone. Two and a half years after the first case was discovered, the outbreak ended with more than 28,600 cases and 11,325 deaths.

This tragically illustrates the complexity of the interactions between ecosystems, animals and humans. If we are going to prepare for and prevent infectious disease outbreaks with pandemic potential, we must consider **systems** more widely and how they are interconnected.



Governance of One Health is concerned with how we structure processes in One Health. **Governance for** One Health refers to how we incorporate One Health considerations into all relevant policies and sectors to achieve healthy societies, healthy animals and healthy ecosystems.



It can be difficult to define **governance** because there are various interpretations from different **disciplines** and **sectors**. The United Nations Commission on Global Governance (1995) defined it as 'the sum of the many ways individuals



Fig. 14.1. EU policy changes to allow international fishing in 'third' countries including West Africa. Image: flickr.com, John.



Fig. 14.2. Local communities unable to source fish protein turn to wildlife hunting. Image: Buschfleisch Ghana, Wikiseal.



Fig. 14.3. Deforestation and climate change can reduce forest areas, concentrating animals and people into smaller areas. Image: flickr.com / Crustmania.



Fig. 14.4. Ebola killed over 11,000 people and left 22,000 orphaned. Image: flickr.com / Global Panorama.

and institutions, public and private, manage their common affairs'. In a review by Dodgson *et al.* (2002), the World Health Organization says it is 'the actions and means adopted by a society to promote collective action and deliver collective solutions in pursuit of common goals'. Another definition considers governance as 'a social function centred on steering societies toward collectively desirable outcomes and away from collectively undesirable outcomes' (Young, 2017).

Essentially, this means the various ways **stakeholder** groups (see Chapter 10 for details on stakeholders and their engagement) are organized and run, both formally and informally. These groups can range from democratically elected national governments to self-organized local community groups. Each group of people that come together may be influenced by social norms, customs or rules on how to interact or resolve conflicts, or they will need to agree on a common set of goals and rules for operating. These can range from legally binding laws (hard law) to simpler informal agreements and non-legally binding decisions (see the discussion on types of policies below).

Governance applies to both private and public groups, including commercial companies, charities and community groups. 'Governments' therefore are a particular example of a formally organized governance system.



The classic understanding of governance is a 'hierarchical governance' structure where leaders decide what needs to be done for everyone else.

In other words, this is a top-down model of decision making that is frequently used by national governments. Often this governance structure shares out these responsibilities between different sectors, such as government ministries or departments, who will have their own area of activity, each with separate lines of decision making. For example, human medicine is traditionally the responsibility of a Ministry of Health. This may be separate from other areas of One Health such as veterinary public health or **environment health**, which may be the shared responsibility of several departments such as a Ministry of Agriculture, Water, Wildlife, Forestry or Environment.

In today's world, there are many variations that have emerged from this hierarchical governance model, some that are more inclusive of other groups or **actors** than others. When governments are making decisions and developing policies to become law, the World

Health Organization (2017) recommends that countries should be transparent in their decision making and allow public participation. This is to ensure that governments take responsibility for their actions, uphold principles of justice and **equity** and comply with the existing rule of law. The involvement or participation of the public or external experts in deliberation and decision making is usually considered a form of good governance.

'Good governance', therefore, can refer to the behaviour of a government or body in how it develops and implements policies and the way it exercises its power.



Policies set the rules that direct the behaviour and actions of a population, as agreed upon through the governance structure. For example, governments establish state laws (i.e. policies) that are the formal rules that a country sets for the relationship between citizens and institutions. In private business, companies may have a set of self-defined standard operating practices (i.e. policies) that incorporate external requirements such as regulations arising from government policy, e.g. meat inspection protocols, or industry standards like 'fair trade' or 'organic', alongside internal corporate values like 'good customer service', 'wearing a uniform' or 'high welfare animal handling'.



In crafting a solution to a problem, governments and other entities can consider a range of push-and-pull policy instruments: from enforced regulations, to offering incentives, or simply advisory information.

Laws are the legally binding rules that govern a population and national legislation (which sets out these laws for a country) comprises the main policies that governments set. The process by which these are made differs from country to country. If laws are the rules laid down, regulations are what are used to monitor or enforce them.

Regulations are adopted by governments and their ministries or authorities in the classic top-down, hierarchical governance approach mentioned above. Regulations can also develop outside governments. In some situations, stakeholders such as private industry can choose to adopt their own standards or self-regulation, for example as might be seen when companies commit to higher standards of animal welfare or lowered

environmental impact (compared to government standards). Such standards often come in when there is a dearth of public regulation.



Similarly, there can be regulations agreed upon from the interactions between different non-governmental organizations (NGOs); in this case they can be called **co-regulation**. An example of co-regulation might be where a house-building company agrees with a community group to protect a local woodland habitat that might exist on land they own and wish to develop, or where live-stock farmers agree not to graze land adjoining wildlife reserves to reduce competition and risk of disease transmission.



Legally regulating as a means to guide a population's behaviour may be considered a **'push' mechanism**, but there is also the option to employ **'pull' mechanisms** to encourage a certain behaviour. This might include incentivization: for example, when governments want citizens to save for old age through a pension, they offer tax relief to working people if they add money to their pension fund, and nudging behaviour by making the enrolment onto a pension scheme the default position so that people have to opt out if they prefer (Thaler and Sunstein, 2009). Making the desired behaviour easier for people can be a powerful tool. For example, chlorine tablets added to water can help to prevent waterborne diseases such as cholera. Usage rates are low, however, because it can be inconvenient or easy to forget to do. Instead, researchers saw greater success when offering liquid chlorine at water points, which was an obvious reminder and convenient for those collecting water (Kremer *et al.*, 2010).

Alternatively, a body can try to influence behaviour in a solely advisory way, providing information on the preferred behaviour. An example would be health warnings on tobacco products, where you are still free to make an unhealthy choice and receive no compensation for making a 'good choice' but the government is interested in encouraging people to stop smoking. This advisory information can be communicated in different forms, such as through school education programmes and television advertising to increase awareness or warnings on packets.



Government policies are often developed by the relevant government ministry in response to an identified problem. In democratic systems, there are several stages where stakeholders can input on draft legislation before a policy is finalized and passed into law. In non-democratic or authoritarian regimes, the policy-making process may be more centralized and less inclusive, with decisions being made by a select group of individuals or ruling authorities without significant input from external stakeholders or the general public.

Classically in democratic societies, the process of making policy can be broken down into several steps, starting with **(i) problem identification** (Fig. 14.5). This might be a result of new research emerging or an event such as a natural disaster which demands new policy or an update to existing legislation. Once the problem has been identified, then the government needs to commit to give attention to this area by prioritizing it and **(ii) getting it on the agenda**.

Once the issue has been featured on the government's agenda, **(iii) a draft policy is formulated**. In general, policies are drafted by the relevant public sector departments following inputs from the government, sometimes in consultation with external stakeholders or the public. For stakeholder engagement, there needs to be a systematic identification of individuals and institutions who have a stake in the issue (see Chapter 10 on the process of how to include stakeholders). Their participation will help make sure that all aspects of the proposal are properly considered and the 'bigger picture' of a policy's impact can be understood. This should minimize unexpected negative impacts or loopholes that may arise. During stakeholder engagement there should be a mechanism to ensure equitable opportunity to participate no matter their sector or background. Not all stakeholders will have an equal interest in the issue so in any co-design process there may be some stakeholders more involved than others (see Chapter 10 for more details). This will be discussed in Section 14.2. At this stage it is also important to consider how the policy will interact with other existing policies both nationally and globally.

Following the initial development, draft policies are proposed to the wider group of policy makers, often elected members of a parliament or congress, for consideration. There may be debates held, specialist committee scrutiny and public consultation on the draft policy (as shown in the following applied example from

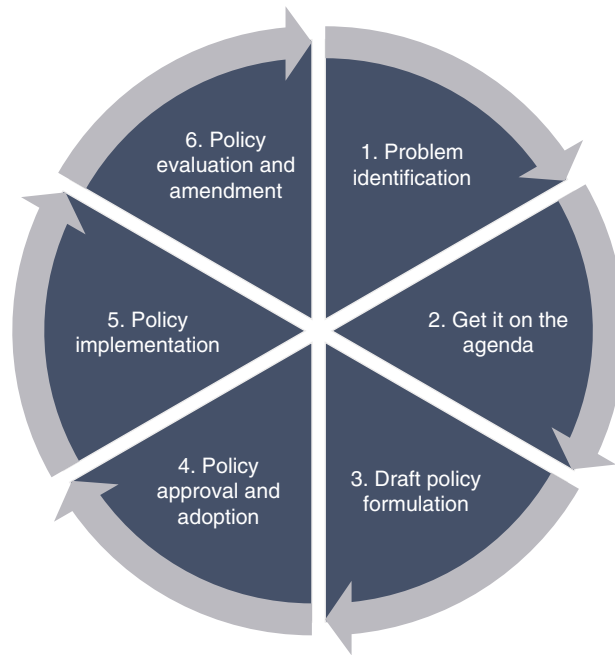


Fig. 14.5. Policy-making process. The six stages of policy making are often a continuous process of design, approval, implementation, evaluation and amendment. Developed by the authors.

Tanzania). Amendments might also be suggested and further debated during these stages. Once any amendments are agreed or rejected then **(iv) the policy is adopted** and passed into law.

Adoption of laws is often not sufficient to entirely change behaviour and thus **(v) policy implementation** will need to be decided upon, considering how best to achieve the law's goal. These different approaches or 'policy instruments' have been described above.

After a policy is implemented, it should be regularly **(vi) evaluated**, and the results used to review and **amend** the policy to improve its performance. See Chapter 12 for guidance on how to conduct **evaluations** of One Health initiatives.



Influencing policy: Youth-led organizations in Tanzania

In university, there are often student associations linked to various health-related professions. In Tanzania the student association of pharmacists led a campaign to join forces with others to tackle antimicrobial resistance (AMR) and neglected tropical diseases (NTDs). Different stu-

dent bodies, such as those for medics, vets, environment science and laboratory technicians, came together to advocate for action, influence policy and promote **sustainability**. This student task force had around 3000 members and petitioned government ministers to attend their meetings and to value a youth perspective on AMR and NTDs. After this, the Ministry invited youth representatives to participate in reviewing national policies on NTDs and their One Health Strategic Plan.

In 2019, the One Health Society (OHS) Tanzania was founded as a youth-led NGO (Fig. 14.6). The society acts as a platform for youth to engage, influence policy and impact their community through translating documents into local languages, running community engagement activities and advocating for continued youth representation in government policy making.



Once agreed upon, policies, e.g. laws, then need to be interpreted and upheld for them to function effectively.



Fig. 14.6. OHS Tanzania's logo.

The legal system plays a vital role in interpreting the meaning, intention and scope of the law, as well as judging when the law has been broken. Legislation (i.e. laws) and other policies should specify the authorities responsible for enforcing them, and grant the necessary powers to that authority to carry out this task.

Sometimes people adapt to laws in a way that can defeat or avoid their purpose. A common example is people finding new ways to evade taxes or failing to report environmental contamination or disease outbreaks. Sometimes, someone's interpretation of the law may be tested in the courts. If this unintended interpretation of the law is deemed allowable and it defeats the purpose of the law, then laws might need to be amended and evolve to be able to deliver on their original aims.



Are laws the best way to get things done?

Task: The process of passing legally binding rules for a governance system, as with national laws, is a powerful tool to influence behaviour but it can be very slow to establish and demand enforcement interventions to uphold. These can take a lot more resources than persuading a change in behaviour through a public advice campaign, for example.

Can you think of examples where there have been efforts to change behaviour through different mechanisms, such as laws, incentive schemes or public advice campaigns?

Discussion points and examples: Think about your own daily life:

- **How are you persuaded to brush your teeth in the morning or wash your hands after going to the toilet?** Public information campaigns provide information but are not regulated. This information might be delivered through school or through other media channels. Often the advice is targeted on children and families to build good hygiene habits from a young age to prevent dental disease or infection spread.

- **How do you choose a healthy meal?** You may receive information through advertising or education campaigns that teach people not to eat too much salt, fat or sugar, for example. The food you buy may be labelled and the companies must meet regulations around food safety or added ingredients such as allergens or sugar. Your choice is not mandated by law but there are several factors influencing your choice: for example, public health information warning against too much sugar in your diet versus the marketing campaigns attempting to persuade you to purchase the item.
- **How do you get to work or school?** If you travel in a car, in many countries it is a legal requirement to have a regular vehicle safety check and the driver is legally required to pass a driving test. There are legally imposed speed limits. What makes people comply with these rules? Public safety information and peer pressure can help to persuade good behaviour, but the rules need to be enforced for them to be upheld. These could be through traffic officers or automatic speed cameras that will catch people driving too fast and issue a fine. Multiple infringements of the rules often also incur a negative mark on your record. Commit multiple small offences and you could lose your licence to allow you to drive legally.



Policies should be based on evidence but evidence may take different forms and come from varying perspectives. Additionally, policies may need to be drafted before all the evidence is available or an issue is fully understood.

The interface between science, evidence and policy is a very important one but may not be a direct one. There are different ways that evidence, such as clinical trial data or environmental survey results, might be used to help inform a new policy or to update an existing one. Evidence can be presented to policy makers, for example, through government expert advisory groups or 'non-state actors' such as academics when they publish reports or give seminars. Policy makers may also hold consultations with the public or civil society organizations (such as charities) to invite their input at different stages of the process. An applied example of written policy briefs or evidence syntheses from the UK's Parliament is provided later in the chapter.

It is important to recognize that policy makers will also bring their own personal experience or professional *knowledge* into any work. This perspective may have been influenced through mainstream or social media or they may have lived experiences. It is important to understand the weight that different types of evidence hold and how to integrate quantitative and qualitative information as well as different forms of knowledge, and to consider where evidence gaps exist and how to handle conflicting evidence. See also Chapters 3–5 for more information on this.



There is increasing emphasis being placed on using evidence to inform policy decisions, but evidence is not the only influencing factor for policy makers. We must consider politics and the potential for conflicting views on what is the right way forward.

Taking a One Health approach involves different sectors working together and it is possible for there to be differences or conflict about the desired outcome or the best way to achieve it. Scientific evidence can help balance and guide the discussion, but it will not solve the problem by itself. There might need to be **trade-offs** or compromise between the aims and strategies of the different stakeholders. Deciding what to prioritize involves deciding why this issue is more important than another. In a democratic system, politicians are elected to deliberate between a number of options, but the ruling party will get ultimate power to make the final selection, e.g. through a vote where they can expect to win a majority. In a few countries with a ‘direct democracy’, the population can vote directly on issues. In Switzerland, for example, the citizens voted directly to phase out nuclear reactors and instead increase renewable energy sources for their electricity.

In business, decisions may be put to the company shareholders for a vote or the Board of Directors to decide upon. Other tools to resolve disagreements on contentious issues can include a citizen assembly or panel. This is where a group of the public are selected at random (similar to a jury in a court of law) to represent society in discussion sessions around the policy issue. The citizen’s panel then make a final recommendation to the government.

At a local level, communities may form their own groups with a particular focus to take local action. For example, community-managed conservation areas,

such as community forests, marine protected areas and Indigenous territories, could be established to maintain and safeguard local natural resources. These areas might be subject to certain rules agreed between the community members, with local residents actively participating in decision making, patrolling and enforcement to safeguard these habitats.

Because One Health issues often touch on fundamental issues, such as how we live, how we eat and how we care for our environment, it is often unavoidably a political issue. The challenge of deciding on a shared or common goal is made more complicated by the often broad diversity of stakeholders and countries involved, each with their own political agenda and cultural sensitivities. In achieving the common goal, there are likely to be some countries or stakeholders that stand to benefit more than others, or those who will have to work harder to achieve the goal, alongside differences in the financial contribution made. Here the roles of international organizations such as the United Nations (UN) agencies or regional organizations like the African Union are crucial to finding common solutions. The UN agencies most concerned with One Health issues have formed an alliance known as the Quadripartite alliance for One Health to support the mainstreaming of One Health.



UN Quadripartite alliance for One Health:

To identify common goals between stakeholders and help address the potential conflicts that might arise when multiple partners work together for One Health issues, alliances can be formed. The Food and Agriculture Organization of the United Nations (FAO), the UN Environment Programme (UNEP), the World Health Organization (WHO) and the World Organisation for Animal Health (WOAH) have agreed to cooperate to combat health risks at the human–animal–ecosystems interface and sustainably balance and optimize the health of humans, animals, plants and the environment. This alliance is known as the Quadripartite and has a Chair position that rotates between each of the agencies.

The Quadripartite helps deliver ‘global public goods’, i.e. those goods that are available to everyone and do not diminish after use, such as clean air, by motivating each organization to work towards these common goals in a shared way. Successes of this alliance have been the

setting of shared goals where each UN agency has a stake either in the delivery or outcome of the goal.

The Quadripartite agreed upon an initial framework for action with a set of activities that the four organizations can offer together to enable countries to mainstream and sustainably scale up One Health in managing health threats to humans, animals, plants and the environment. This is known as the One Health Joint Plan of Action (Quadripartite, 2022) and includes goals for curbing AMR, reducing the risk of emerging zoonotic pandemics, controlling and eliminating zoonotic neglected tropical disease and food safety amongst others (Fig. 14.7). Countries can then align their National Action Plans to this global Joint Plan of Action in what might be considered a form of top-down governance influence.

Collaboration can prove challenging, however, when each agency has its own responsibilities or objectives, and there may be differences in the

size of budget or resources each must work with. There is also potential for inequity in agenda setting given the discrepancy between each participating agency's influence in the wider UN structure. There are also potential gains, however, with smaller bodies such as WOH and UNEP joining the wider alliance, as they could benefit from improved advocacy or influencing power as part of a bigger stakeholder.



International agreements, such as a treaty, can be a way to unite countries to a common goal but allow each country to implement the policy as they see best.



A **TREATY** is a written agreement between two or more countries on an issue of global concern, such as antimicrobial resistance or climate change. There is agreement on the intent to act but the decision-making power is placed on the country



Fig. 14.7. United Nations, Geneva (CC BY-SA 4.0 DEED Attribution-ShareAlike 4.0 International).

to interpret the treaty or convention and select the best route for implementation. For example, the Convention on Biological Diversity (UNTS, 1992) is an international environmental agreement or framework that sets standards and requires countries to develop National Biodiversity Strategies and Action Plans (NBSAPs). It proposes legally binding obligations for each country that is party to the convention, but each member state has the flexibility to achieve these obligations in their own way, through their own national laws according to their own national or regional priorities. As part of those obligations, countries must report back on the actions taken to implement the Convention and their *effectiveness*.



Once a policy has been developed, then it needs to be implemented. This often requires allocation of responsibilities and resources, including the financial means to pay for implementation and enforcement. It is also important to decide how to measure impact, success or value for money.

Any policy proposal should include an analysis of the (i) financial costs and (ii) economic consequences related to its implementation. This may be retrospective as part of an evaluation process or prospective, for example, when proposing a new policy to the Ministry of Finance or a national treasury for funding approval.

1. The financial aspect concerns the money and resources to be allocated to the public and private entities involved in policy implementation. These provisions must be sufficient to ensure that each collaborating entity is able to procure the material resources and the technical skills necessary to conduct the policy's commitments in the suggested timescale.
2. The economic aspect concerns the potential of the new policy to create a net social benefit, i.e. the policy outcomes should bring an overall benefit that society values more than the costs incurred for its implementation. Furthermore, the net social benefit must exceed the one created by alternative policies, including 'business-as-usual' solutions in which no change is initiated. One Health analysis across the whole system, incorporating the costs and benefits in human, animal, plant and environment sectors, should provide a more comprehensive analysis of a policy's costs and impact than

traditional single-sector review. See Chapter 13 for more information on how to structure economic evaluations of One Health initiatives.

14.2 Why Do We Need One Health-Specific Governance?

One Health governance refers to the structures and organizations that play a role in or exert influence over the health of humans, animals and the environment, and is underpinned by several considerations and norms that stress their interconnectedness. From a One Health governance perspective, it is important that institutions, finance structures and policies function across sectors to support healthy humans, animals and ecosystems in a more joined-up way.



These cross-sector governance mechanisms may not always be labelled One Health but, importantly, will serve to strengthen the whole health system.

Traditional, narrow and sector-specific approaches in policy making may not only miss opportunities for more effective or efficient policy solutions but, when policy development has been inconsiderate of other disciplines, as well as social, economic and cultural contexts, it may result in unforeseen and detrimental consequences. Collaboration of individuals, communities and organizations within and between different sectors maximizes the benefits of shared knowledge and can increase acceptance and 'buy in' to new policies. A diversity of perspectives and evidence considered helps to avoid any unintended impacts from a policy and can help to get the best value for money.

Governance structures can be both a barrier and facilitating contributor to implementing the One Health approach and seeing it widely adopted. Many One Health success stories have relied on informal mechanisms, such as personal relationships between staff in different institutions or suitable individuals just being in the right place at the right time, but it would be preferable to formalize the structures to increase the likelihood of this being the case. More recently, some countries have established formal One Health multi-sector coordination governance mechanisms through an inter-ministerial body (One Health platforms or units), which sit independently beneath the prime minister or

president's office rather than in any one ministry. An applied example of this from Bhutan follows.



Bhutan's One Health Secretariat: In Bhutan, the government have established a formal One Health governance structure through an Inter-Ministerial Committee for One Health (IMCOH) supported by a Bhutan One Health Secretariat. The Secretariat acts as a focal point for coordinating all national activities related to One Health, such as development and implementation of a One Health agenda, coordinated disease surveillance, field outbreak investigation and response, risk communication, advocacy and engagement of the community and environment sectors, and collaborative research. The secretariat sits within a central department at the Royal Center for Disease Control (RCDC) to create an equitable space for participation from the key ministries. To make sure that the secretariat's work remains closely linked to the existing ministries, they use a shared leadership approach, with a rotating chair known as secretaries (highest bureaucratic position) taken from each of the two key ministries, the Ministry of Health and the Ministry of Agriculture and Livestock. The Secretariat will support members to agree on a list of priority issues that require a One Health approach, e.g. **zoonotic disease** control. They also organize One Health conferences regularly and help to determine the financial contributions needed from each ministry and agencies for each area of work.

There are many demands of a governance structure to allow for cross-sector, multilevel and transdisciplinary relationships that can also adapt as our understanding of the human–animal–plant–environment interface continues to evolve. **Here we discuss aspects of governance systems to allow the One Health approach to be fully realized.**

14.2.1 Communication, coordination and collaboration across sectors



One of the main challenges associated with intersectoral governance is the difference in problem perception or what priorities are set. For

example, those working in human health tend to judge a situation in terms of improvement of human health, while those in animal health or food production will be interested in goals related to animal **wellbeing** and/or productivity.

Rather than eliminate these differences, good One Health governance can help to resolve conflict and competition between organizations which can often arise when the responsibility for addressing certain issues is not clearly assigned. Despite favourable governance structures, it can still be difficult to balance the importance of outcomes across the sectors or stakeholders (see Chapter 15 on *Sustainable Development Goals*).



Task: How to manage differing priorities:

One Health approaches consider and engage a range of stakeholders to work towards issues that involve them in some way. However, stakeholders may not always have been motivated by the same thing. For example, in the control of zoonotic parasitic diseases that pass through livestock as an intermediate host before infecting humans, it would be preferable to prevent the infection of people by controlling the parasites (e.g. *Echinococcus granulosus*) in the animal stage (e.g. sheep). Despite presenting a serious public health risk for people, the condition in sheep is not perceived as important to the productivity of sheep by farmers. It is important to foresee and accept there may be differing priorities for each stakeholder rather than expecting all stakeholders to automatically accept human health priorities, as is often the case. If possible, finding common ground for collaboration can achieve the same, shared or similar outcomes but helps to engage stakeholders on their own terms.

Understanding objectives from the whole system is important to help identify common ground for different sectors to collaborate, but what happens when those outcomes are conflicting?

For example, should tackling malnutrition by producing more safe food for the world come at the cost of poor farm animal welfare or increased deforestation for livestock? Try to present the arguments for and against these dilemmas.

Discussion points and examples:

Farm animal welfare vs food security: Within European law, some animals are recognized as ‘sentient beings’ but otherwise non-human animals are treated as ‘things’ under law, unlike the human species that has fundamental rights. Others recognize that improved farm-animal welfare can contribute to increased productivity (i.e. any costs to improving welfare will be paid for by the increase in productivity), so there can be a shared objective between those advocating food security concerns and those advocating animal welfare (Farm Animal Welfare Council, n.d.).

But what happens when we need to cut down prime rainforest areas to produce meat or to build new houses or hospitals? There may be long-term benefits to humans of protecting forests, such as carbon sequestration from the atmosphere, but in the short term there are obvious benefits of building new hospitals.

Is providing more farmed animals for food, or hospitals or houses, equally beneficial to human health as protecting the forest would be? Should human health outcomes always be prioritized over those of wildlife or the ecosystem? The outcomes of interest might occur over different timescales – often the human health outcomes are short term, dealing with affected people to cure or prevent disease now. But when we talk about climate change and ecosystem health, we might be talking about much longer timescales, decades, maybe centuries. The duration of democratic cycles, i.e. the length of time before a leader must face elections again, could influence the timescale over which the benefits will be assessed and prioritized.

Consider how the method of evaluation might have an impact. For example, economic assessment of costs and benefits might be over a specific timescale or only look at impacts in one sector and not fully assess unintended impacts elsewhere. For example, pollution from manufacturing may not be calculated in the assessment to build a new factory or facility.

14.2.2 Communication, coordination and collaboration across groups



Healthy ecosystems often involve many different stakeholders and organizations working on any particular issue. So, One Health issues often demand different groups to work together in a multilateral collaboration, with multilateral

meaning to have contributors from three or more groups. This could be when multiple countries come together or when public (i.e. government) and private organizations collaborate.

The different groups may have their own methodologies, knowledge, beliefs or languages so it is important in One Health governance that there are respectful partnerships between groups of people from different backgrounds and disciplines. See also Chapter 3 on *transdisciplinarity* and Chapter 4 on *knowledge integration*.

Collaborations across governance scales and bodies are very common and have been formalized to varying extents, for example, public–private partnerships (PPPs) where NGOs may be asked to deliver a government public health programme. An example of this is private pharmaceutical companies donating anthelmintic (deworming) drugs to school public health programmes. These public health programmes are coordinated by the World Health Organization and national governments but sometimes delivered by NGOs and local health workers and schools.



Communicating science evidence to policy makers

Policy briefs and evidence syntheses: A policy brief or evidence synthesis is the process of bringing together and evaluating multiple sources of evidence and presenting it in a way that helps describe the big picture. Often these will be on particular areas that are topical to current policy debates. They are a useful tool to bridge the gap between primary scientific research and data publications, which may focus on a technical or specific area of interest, and the need to understand the situation at large. These syntheses help to piece together many of these more specific evidence sources into a bigger picture view that communicates essential context, describes limitations of the evidence base and provides examples or case studies.

Policy makers may specifically commission evidence syntheses as ‘policy briefs’. An effective policy brief must be written in an accessible way for those from different professional backgrounds that may be stakeholders in policy development or decision making. Thus, a policy brief or evidence synthesis should be unbiased and accurate, but also concise so that stakeholders can become



Fig. 14.8. In the UK, the Parliamentary Office of Science and Technology is one of the world's longest-standing legislative science advice networks. UK Parliament building. (Authors' own image.)

quickly informed on the overall situation while still understanding the limitations or complexity of the evidence relating to a particular subject.

In the UK, the Parliamentary Office of Science and Technology (POST, n.d.) is one of the world's longest standing legislative science advice networks. POST specializes in sourcing scientific evidence and making it accessible to all UK Parliamentarians, no matter their professional background (Fig. 14.8). Topics for these policy briefs are identified by horizon scanning for upcoming areas of interest or commissioned by government committees on topics they may be scrutinizing.

Rapid evidence assessments may be completed where there is an urgent need, e.g. in response to an unforeseen area for legislation or investigation by parliament. These will be done in partnerships with academic experts able to quickly review and synthesize the evidence. More routine briefings are mostly written by POST fellows, who are science and technology PhD students who specialize in the subject area and undertake a placement with supervision at POST in between their studies. This approach ensures the scientific rigour of these briefs and also helps to improve academia's

understanding of the policy-making process and the needs of policy makers when these fellows return to their research institutions.

Examples include briefings on indoor air quality, environmentally sustainable diets or taking a One Health approach to public health and climate change. More information about speaking with policy makers can be found in Thomson (2021).

14.2.3 Communication, coordination and collaboration across levels

The distribution of responsibility and power will be different between sectors and countries for different issues. For some One Health issues, the focus might be national, such as for food safety policy, but some responsibility or power is also devolved to a more localized district authority. This can be helpful to allow the districts to tailor the national policy for their own local context, e.g. where a particular type of industry or crop occurs in one district but not in another.



One Health governance will need to be multi-level, i.e. function across levels, from the local

to national or even international level. This demands coordinating several, potentially diverse, existing governance structures or groups. For example, trade of food products occurs across the world and a global policy might want to control disease spread. Multiple countries may agree to meet international trade regulations, but these policies may be quite general in order to be appropriate to lots of different country contexts. National or cross-border policies may therefore be developed with more detail to stop spread in or out of a country, with even more localized policies within countries to prevent spread into or out of individual districts or farms.

The extent to which decision-making power is devolved to national or district levels can vary a lot between countries and even between sectors within a country. For example, human health might be mostly governed at national level, where veterinary health services might be mostly devolved to district level. Good One Health governance and policies should be flexible enough to adapt to the idiosyncrasies of each local context, recognizing that a one-size-fits-all policy is often not appropriate for the many different political, social and economic realities that One Health issues involve.

As well as considering the flow of policy influence from top (international powers) to bottom (the local receiving population), there is also an influence running from bottom to top. With increased connectivity between people and goods in our modern world, what happens at the local level can have an impact anywhere in the world.

14.2.4 What governance may be most suitable for One Health?

The interconnected nature and ever-changing issues that are often found in a One Health system demand a suitable form of governance that can adapt to a changing situation when needed, can incorporate many perspectives and will consider different groups' needs. Given the interdependence of the various stakeholders within One Health, traditional top-down approaches may not be able to cope with the diverse challenges and opportunities presented. Instead, a more decentralized and collaborative approach may be better suited. Characteristics of such a form of governance should consider:

- **How to engage multiple stakeholders and be inclusive:** A suitable governance approach should allow for active participation and representation from diverse stakeholders. For example, in a food-related matter, this could mean farmers, producers, consumers, retailers, policy makers, scientists and civil society organizations. Engaging a broad range of stakeholders ensures that different perspectives, expertise and interests are considered in decision making. A limiting factor to stakeholder engagement could be: capacity, such as a time-pressed smallholder farmer; or where certain groups, e.g. women, might not be routinely involved in decisions about livestock health despite being the primary carers for their animals; or where a particular department or organization might be invited to many more meetings than they have staff available for. Having a governance system that can incorporate a diversity of power structures can also allow for locally led or bottom-up approaches.
- **Consider interactions across the whole system (systems thinking) and how sustainable any impact will be:** One Health systems are intricate webs of interactions and interdependencies. Governance should account for this by adopting a systems-thinking approach (see Chapter 10 for more information on *systems thinking*). This will help to consider the interconnectedness of various components of any issue under consideration and the ripple effects of any policies and actions throughout the whole system. This also applies to how such policies or actions might be evaluated and which metrics are selected to indicate if it was good value-for-money or successful. Suitably considering and accounting for the impacts (desired and unintended) across the whole system, and over different timescales, will help to ensure that progress or behaviour change can be sustained.
- **How to adapt and respond to new information or changes in the system:** Health systems are subject to constant change: for example, environmental changes such as climate change; economic changes such as global oil prices; and social factors such as the different political views of ruling parties. A suitable governance approach therefore needs to be flexible, adaptive and capable of responding to any emerging challenges, such as infectious disease outbreaks. An adaptive and responsive approach can also capitalize on new opportunities in real time, such as those arising from a social movement.
- **Maximizing decision making informed by evidence and continuous learning:** Governance

decisions should be based on sound evidence and data where available. Rigorous research and analysis help policy makers understand the impacts of their decisions and inform effective strategies. It is important that this evidence and its limitations be presented to policy makers in an accessible way and that decisions be re-evaluated in the face of new evidence or any lessons learned during the implementation of a policy or action. (See the previous applied example of the UK Government on communicating science to policy makers.)

- **Cross-sector, multilevel and multilateral financing:** *Financial governance* for One Health needs to be able to work across levels, sectors and different stakeholder groups. It needs to recognize that responsibilities between stakeholders may not be equally distributed and that the costs and benefits may occur in different sectors. Similarly, any financial governance structure needs to account for the likely increased initial costs associated with establishing this new, integrated or collaborative way of working in health, where the benefits might be more difficult to measure or occur over a slower timescale (see Chapter 13 and the following applied example).



Economic aspects of One Health

1. Control of rabies demonstrates the issues that can arise when governance processes such as evaluation of costs and benefits do not support One Health working. Rabies is a viral infection that affects many species but preventing disease in humans is best achieved by preventing transmission from domestic dogs by controlling the disease in dogs rather than any interventions aimed directly at people. In fact, vaccinating dogs against rabies is about 50 times cheaper than providing post-exposure treatment to people and is the only way to sustainably prevent human rabies deaths (Hampson *et al.*, 2015). However, responsibility for dog-based interventions lies with the Ministry or district authority concerned with animal health and their priorities may lie elsewhere, for example, with food-producing animal health such as cattle or poultry.

Individual dog owners may listen to advisory information or act on incentives such as free dog vaccination to protect themselves and their animal; however, for those dogs without owners (stray), or where owners are unable or unwilling to vaccinate their dogs, there is an issue. Mobilizing funding from the human health sector to prevent human rabies deaths through dog vaccination can be problematic when the governance structures of funding institutions specify their responsibilities are to human health.

With a One Health governance structure, having the intervention (dog vaccination) sit in another sector to the benefit or funding institution (human health) could be less problematic. But this requires a suitable approach to evaluation of success, where this separation of costs and benefits between sectors is taken into account. In Latin America (Vigilato *et al.*, 2018), in order to overcome this mismatch of responsibilities, the liability for control of animal rabies now sits under the ministries responsible for human health.

2. Barriers to cross-sector working can relate to historic governance structures such as separation of those working with different samples in a diagnostics laboratory. In a laboratory processing samples from human, animal or environmental sources, the skills required from staff and the work they perform are similar. For example, laboratory technicians or the epidemiologists analysing data will perform similar work despite their training background or where their samples came from. They may, however, be offered different payment levels depending on the sector they belong to.

Here, having a One Health governance approach could allow for a more adaptive workforce structure. For example, in the global COVID-19 pandemic, laboratory staff trained in the animal health sector were able to help out in a time of increased surge demand on human health laboratories. However, there can be financial barriers to taking this approach when deciding where the responsibility for funding this work would sit. There may also be discrepancies between the pay offered to those from a human health background compared to those from animal or environmental health.

14.3 Conclusions: One Health Policy and Governance

- The modification of existing policy and governance structures, or the creation of new One Health governance structures, is required to create the 'enabling environment' that will allow the full benefits of taking a One Health approach to be realized.
- Those tasked with implementing a One Health approach need to be given enough decision-making responsibility and financial ability to effectively bring the sectors together, overcoming the inevitable challenges of establishing integrated working between normally segregated groups.
- Any new governance structure or policy will need to engage stakeholders on their own terms, such that common ground and shared objectives can motivate engagement from a wide range of partners (across levels, sectors and groups) with clear pathways for action.
- One Health practitioners must remain informed across a wide variety of evidence sources and types, representing fairly and respectfully a wide variety of disciplines and stakeholders outside their expertise and engaging their sector and policy makers with tailored communications.

14.4 Putting the Theory into Practice: Mapping One Health Systems, Implementing One Health Policy Making and Communicating to Decision Makers

This section of the chapter guides you through an activity that will help you to apply the learnings from the Policy and Governance chapter.



Task: You are invited to advise on a new Government policy

Scenario: The government have summoned a meeting of the scientific advisory group on which you sit. They tell you that they have ambitions to

improve the economy, create jobs and reduce their carbon footprint by investing in renewable energy. They propose switching the national electricity generation away from coal-fired plants to a new hydroelectric dam (Fig. 14.9). To create this dam, they will need to increase the size of an existing lake by flooding a small rural valley. This may mean that some villages become separated on either side of the banks, and they will lose some agricultural land used to grow crops and graze cattle.

While this dam is being built, there will be downstream damage to the river ecosystem as water flow is drastically reduced. Additionally, the increase in standing water in the lake will increase the habitat for vectors of human and animal disease such as snails and insects.

Imagine this scenario as if you are scientists sitting on a government advisory group; you are tasked with advising on a solution that will best work for all stakeholders!

Identify the health system in your country or a selected country of choice: First, describe the governance structure of your selected country's One Health relevant institutions. Which government ministries or national institutions hold responsibility for human, animal, plant and ecosystem health? How do they communicate, coordinate or collaborate in their areas of shared interest?

Build your task team: Based on the scenario, who would you want to consult with? On what grounds would you approach these stakeholders to interest them in the issue?

Have a go at co-design: If you are able, form a small discussion group or, alternatively, imagine different stakeholders and their perspectives. Assume the roles of different stakeholders, e.g. national public health official, the village leader, veterinarian from World Organisation for Animal Health, government treasury representative, climate change scientist, or others. What would your main points for discussion be? How would you reach an agreement between your different priorities?

Developing policy solutions: Consider what policy solutions there might be to help achieve the best outcome for the government's hydroelectric dam proposal. How would you implement the policy ideas? What might the barriers be to implementation? Are there compromises that must be made to accommodate everyone's interests (Fig. 14.10)?



Fig. 14.9. Kürpsay hydroelectric dam in Kyrgyzstan. Image: Wikimedia/Firespeaker.



Fig. 14.10. The human-made dam in Keranso, Ethiopia traps water from the previous rainy season which the local community uses for washing clothes, bathing, swimming, taking home for household chores, as well as to provide water for their cattle. The pond is also home to freshwater snails that host schistosomiasis, otherwise known as bilharzia. Access to clean piped water, or even water from a clean protected source, is limited, and many people in the community rely on this and similarly unprotected pools, ponds, streams and rivers for bathing, washing clothes and other household chores. According to the villagers in Keranso, one 20-litre jerrycan of clean/safe drinking water costs 15 birr, and a 30-litre jerrycan costs 20 birr – a prohibitive amount for anything other than for drinking. Image: Indrias G. Kassaye, Unlimit Health.

Briefing the Minister: Write a policy brief or present a 3-minute pitch for your imagined Minister. You should set out the problem, need, current situation, political considerations and policy options with discussion of pros and cons of each. Think about how you will communicate your ideas and information to best inform the policy makers' (Minister's) decision. Ensure your briefing is suitable for someone from a non-science background and keep it brief – a maximum of two sides of A4 or a 3-minute presentation!

Activity discussion points:

1. Identify the health system in your country or a selected country of choice:

- Use government websites to identify the ministries or departments that might be relevant. What other public bodies exist (i.e. those tasked to deliver a public or government service but that do not have a Minister)? For example: technical advisory groups or non-executive government departments such as an office for statistics, meteorological data or a regulatory body such as those on health and safety or environmental inspection.
 - The system map or list does not need to be exhaustive, but it is helpful to understand how governance systems can be arranged and separate out responsibilities differently. It is helpful to identify how some of the stakeholders communicate, influence or collaborate and where others may be excluded.
 - Focus on the main ministries or bodies that are relevant to the scenario and what areas of the scenario might cross over between responsibilities of different ministries or bodies.
 - Who are the non-state actors of relevance (e.g. NGOs or private companies)?
- #### 2. Build your task team and have a go at co-design:
- Refer to the list or systems map you created in step 1 to identify those public and non-state stakeholders that are of relevance to the scenario. Are there multiple people from some ministries? Are there particular job roles or advisory bodies that you would want to consult?
 - Thinking about the example of snail vector increase as a risk factor for human and cattle schisto-

somiasis, the change of habitat from river to dam and increased water may provide more habitat for snails as a vector for schistosomiasis in both humans and cattle. Recognizing this risk early by involving the right stakeholders in the discussion can allow mitigation measures to be put in place. For more information see World Health Organization (2022, p. 1).

- Who are the non-state actors and what perspective are they coming from? NGOs also come from a diversity of backgrounds and could be interested in different things, e.g. preventing increased human or animal disease from vector habitat increase when the land is flooded, or they could be helping to represent small communities affected and ensure they are consulted. Private companies could be interested to win the contract to build the dam or to distribute the electricity it generates. Others may be concerned that local roads will be shut down, affecting transport of goods, or their agricultural land will be reduced.
- Stakeholders may be from different organizations but on what grounds are they engaging? For example, wildlife experts from government organizations or NGOs might share a similar interest in how ecosystems may be disrupted when the water flow is changed. Although coming from a different perspective, those from private water companies might also be interested in how water flow is disrupted but with their main concern for water supply, not ecosystem disruption.
- This does not need to be an exhaustive list but consider where the common issues or motivating factors might lie to persuade your team to engage with this issue and who they might find have similar aims despite coming from different backgrounds.

3. Developing policy solutions:

- Put yourselves in the shoes of different stakeholders around the table. What are the differing priorities for all those people who are linked to the scenario? Are there any areas of conflict and how could a compromise be reached? For example, creating dams may displace communities and businesses and affect how they interact with neighbouring villages. Some communities may feel unfairly disadvantaged despite recognizing that there may be a national benefit to the dam building. A compromise could be that the government or the construction contractor must include

a boat pier and ferry service to ensure a way to travel across the area.

- Returning to the example of snail vector increase as a risk factor for human and cattle schistosomiasis, what policies could be put in place to mitigate public health risk? This could be a responsive action in the form of mass deworming treatment policy for local people or targeted at those who are at highest risk (e.g. in contact with the water or cattle). It could also take on a One Health approach by considering multisector control points such as environmental controls. These could include control of the snail vector through clearing vegetation from the water edges in occupied areas or introduction of natural predators (e.g. freshwater shrimp) if these are locally suitable for the ecosystem and community.
- Consider where resolution of conflicting priorities between stakeholders might be more difficult, e.g. there may be reduced carbon emissions from increasing renewable energy use, which would help mitigate climate change, and there may be economic benefits to increasing national reliance on a domestic and renewable energy source but this is at the cost of unavoidable ecosystem damage. Is reducing carbon emissions more important than preserving ecosystems in this scenario? What are the mitigation measures that could be put in place, e.g. creation of local protected habitats, documentation of species and relocation, protected wildlife corridors to aid migration.

4. Briefing the Minister:

- Find examples on the internet of briefs for other issues and decide on what sections your brief or presentation will have. Consider what a person new to the subject would need to know and explain it using non-technical language. Be careful to explain if there are limitations in the advice you are giving, e.g. there is no evidence in a certain area or the evidence is out of date. An absence of evidence is not evidence that there is no cause for concern!
- Search for existing systematic reviews, government reports or evidence syntheses that are related to your topic – these should give a good high-level overview in the abstract or introduction.
- Presenting the evidence in an unbiased way and noting the limitations is important but a policy

brief will often go further and make recommendations based on the available evidence. Sometimes policies will need to be decided upon, even when there are gaps in the evidence, but part of the recommendations can be to gather more evidence and update the policy in the face of new information. Regular evaluations and adjustment of policies and a suggestion for a timeline over which this should occur can be helpful. For example, recommend that in parallel to the dam building (policy implementation) there should be ongoing monitoring and evaluation of the environmental impact or vector-borne disease incidence so that these impacts can be minimized or mitigated.

- In contrast to much science decision making, policy decision making will also need to consider public opinion or political consequences and thus becomes evidence-informed rather than fully evidence-based. Pointing out these influencing factors is helpful. For example, if the dam were to flood an area of national significance, then there might be public outcry and no Minister would want to sign off the project, even if this would be the best place to position the dam based on scientific factors such as topography.
- Keep your brief or your presentation short and clearly structured. Ministers are responsible for many different areas of work so require rapid information that does not require technical knowledge. You should always be clear and transparent about what the evidence says and where you have interpreted that evidence into a recommendation. As an expert you are there to offer your expert opinion so do not be scared to suggest solutions and your ideas – it is for the Minister to decide what the final decision will be!

References

- Dodgson, R., Lee, K. and Drager, N. (2002) *Global Health Governance: A Conceptual Review*. World Health Organization. Available at: https://iris.who.int/bitstream/handle/10665/68934/a85727_eng.pdf;sequence=1 (accessed 8 August 2024).
- Farm Animal Welfare Council (n.d.) *Report on Economics and Farm Animal Welfare*. London. Available at: https://assets.publishing.service.gov.uk/media/5a7d5b5840f0b60a-7f1aa056/FAWC_report_on_economics_and_farm_animal_welfare.pdf (accessed 8 August 2024).
- Hampson, K., Coudeville, L., Lembo, T., Sambo, M., Kieffer, A. *et al.* (2015) Estimating the global burden of endemic ca-

- nine rabies. *PLoS Neglected Tropical Diseases* 9(5). DOI: 10.1371/journal.pntd.0003709.
- Ifesinachi Okafor-Yarwood, D.B. (2020) The duplicity of the European Union Common Fisheries Policy in third countries: Evidence from the Gulf of Guinea. *Ocean and Coastal Management* 184. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0964569119301620?via%3Dihub> (accessed 8 August 2024).
- Khan, A.S.S. (2015) Seafood insecurity, bush meat consumption, and public health emergency in West Africa: Did we miss the early warning signs of an Ebola epidemic? *Maritime Studies* 14(3). DOI: 10.1186/s40152-015-0020-2.
- Kremer, M., Ahuja, A. and Zwane, A.P. (2010) Providing Safe Water: Evidence from Randomized Evaluations. Harvard Environmental Economics Program. Available at: https://heep.hks.harvard.edu/files/heep/files/dp23_kremer-ahuja-petersonzwane.pdf (accessed 8 August 2024).
- Parliamentary Office of Science and Technology (POST) (n.d.). Available at: <https://post.parliament.uk/> (accessed January 2024).
- Quadrupartite (2022) One Health Joint Plan of Action (2022–2026) Working Together for the Health of Humans, Animals, Plants and the Environment. Available at: <https://www.who.int/publications/i/item/9789240059139> (accessed 8 August 2024).
- Rulli, M.C., Santini, M., Hayman, D.T. and D'Odorico, P. (2017) The nexus between forest fragmentation in Africa and Ebola virus disease outbreaks. *Scientific Reports* 7, 41613. DOI: 10.1038/srep41613.
- Thaler, R.H. and Sunstein, C.R. (2009) *Nudge: Improving Decisions about Health, Wealth, and Happiness*. Penguin, London.
- The United Nations Commission on Global Governance (1995) *Our Global Neighborhood: The Report of the Commission on Global Governance*. Oxford University Press. Available at: https://apps.who.int/iris/bitstream/handle/10665/68934/a85727_eng.pdf;sequence=1 (accessed 8 August 2024).
- Thomson, D.J. (2021) *The Art of Science Communication: Sharing Knowledge with Students, the Public, and Policy-makers*. Thomson Publishing, Arlington, Virginia.
- UNTS (1992) Convention on Biological Diversity. Available at: <https://www.cbd.int/> (accessed 8 August 2024).
- Vigilato, M.A.N., Molina-Flores, B., Del Rio Vilas, V.J., Pompei, J.C. and Cosivi, O. (2018) Canine rabies elimination: Governance principles. *Revue Scientifique et Technique* 37(2), 703–709.
- World Health Organization (2017) *Advancing the Right to Health: The Vital Role of Law*. World Health Organization, Geneva. Available at: <https://iris.who.int/handle/10665/252815> (accessed 8 August 2024).
- World Health Organization (2022) Ending the neglect to attain the sustainable development goals. *One Health: Approach for Action Against Neglected Tropical Diseases 2021–2030*. Geneva. Available at: <https://www.who.int/publications/i/item/9789240010352> (accessed 8 August 2024).
- Young, O.R. (2017) *Governing Complex Systems: Social Capital for the Anthropocene (Earth System Governance)*. MIT Press, Cambridge, Massachusetts.