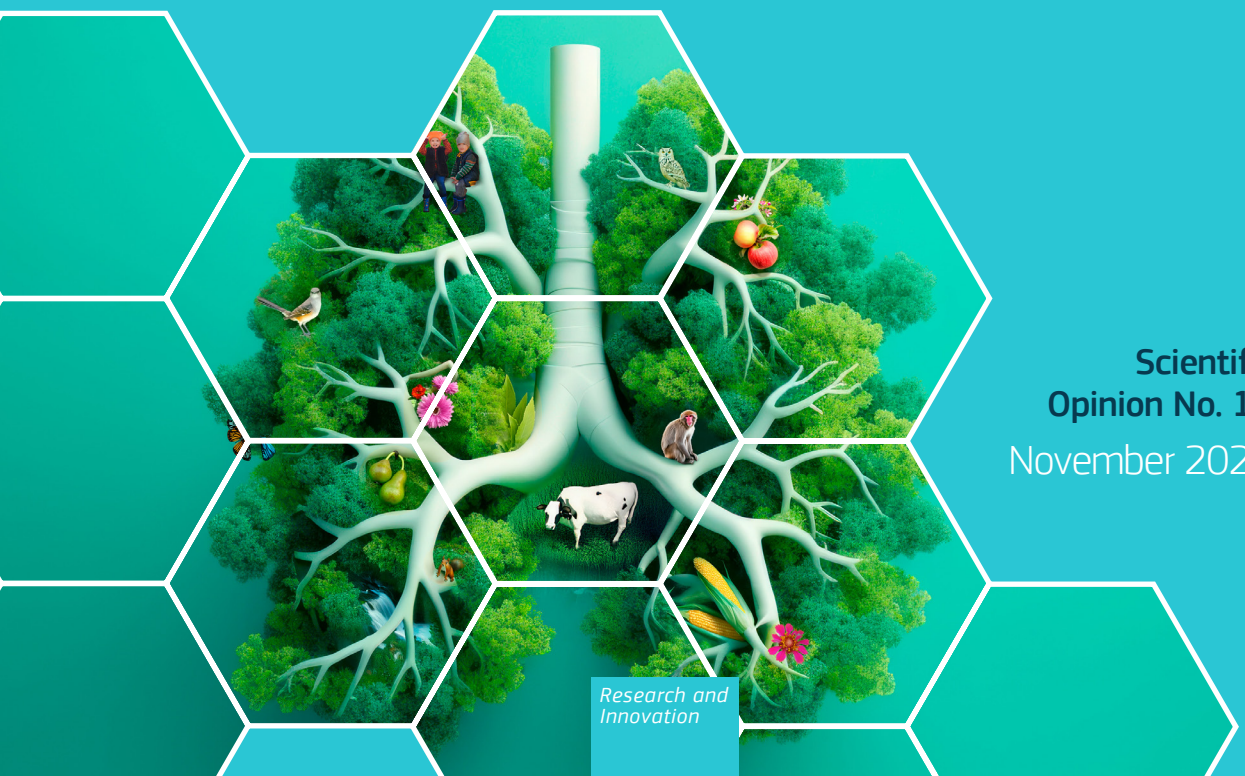
European Commission

Scientific Advice Mechanism

One Health Governance in the European Union

Group of Chief Scientific Advisors

Independent Expert Report



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One Health Governance in the European Union

Group of Chief Scientific Advisors

European Commission
Directorate-General for Research and Innovation
Unit 02 — Science Policy, Advice & Ethics

Email EC-SAM@ec.europa.eu@ec.europa.eu
RTD-PUBLICATIONS@ec.europa.eu
European Commission
B-1049 Brussels

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SCIENTIFIC ADVICE MECHANISM

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Brussels, November 2024

2024 Directorate-General for Research and Innovation

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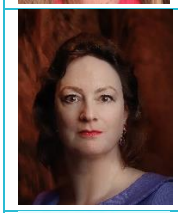
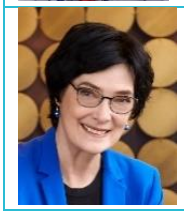
	**Naomi Ellemers** Distinguished Professor of Social and Behavioural Sciences, Utrecht University
	**Maarja Kruusmaa (until 15 October 2024)** Professor of Biorobotics and Vice-rector for Research at the University of Technology (TalTech) in Tallinn
	**Eric F. Lambin** Professor of Geography and Sustainability Science at the Catholic University of Louvain and Stanford University
	**Alberto Melloni (until 15 October 2024)** Professor of History of Christianity at the University of Modena/Reggio Emilia and Chair on Religious Pluralism and Peace at the University of Bologna
	**Nebojša Nakićenović - Deputy Chair** Distinguished Emeritus Research Scholar and former Deputy Director General, International Institute for Applied Systems Analysis (IIASA)
	**Eva Zažímalová** Professor of Experimental Plant Biology at the Charles University in Prague and President of the Czech Academy of Sciences

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The European Commission, Joint Research Centre (JRC);

All the experts listed in Annex 3 who were consulted or contributed in one way or another in the course of the work.

EXECUTIVE SUMMARY

Europe has taken major steps to improve coordination of responses to health crises following the COVID-19 pandemic and the challenges that it brought to our health systems and societies and economies. Since then, new threats and challenges have emerged, and prevention and resilience of health systems must be strengthened through appropriate health policies. At the same time, the United Nations speaks of a triple planetary crisis of climate change, nature loss, and pollution and waste, which also affect human and animal health.

There is now a scientific consensus on the interdependence between the health of humans, animals, and ecosystems (including plants, fungi and bacteria). A vast majority of emerging infectious diseases originate in animals. Human activities such as changing land use and land cover are increasing the exposure of people and domestic animals to wildlife. One result of this is an increased risk of emergence and spillover of pathogens in both directions. Moreover, recent decades have brought an increase in the frequency and severity of extreme weather events, and the growing pace of climate change is having a substantial impact on the health of humans, animals, and ecosystems (including plants, fungi and bacteria). Biodiversity loss too is leading to changes in ecosystems, with additional implications for the spread of infectious agents between species. Beyond infectious diseases, social and economic environments impact the quality of water, air and soil and contribute to vulnerability and resilience of all living organisms, which is important for long-term health outcomes.

A transformational change is required to reflect the recognition of this interconnectedness, with greater collaboration between sectors required to take seriously cross-over, indirect, and long-term effects of seemingly unrelated policies and how these have an impact on health. The One Health approach recognises this need, and places it at its core. To become effective, collaborations must be expanded across administrative and governance institutions at local, regional, national, and international levels.

One major step in this direction has been the adoption of a common approach and joint plan of action by four major organisations – the 'Quadripartite' formed by the Food and Agriculture Organisation of the United Nations, the United Nations Environment Programme, the World Health Organisation, and the World Organisation for Animal Health. The Quadripartite joint plan of

action is intended to facilitate the integration and coordination of actions across the relevant sectors of human, animal and plant health and the environment. The plan identifies six main areas where approaches that currently differ across sectors and countries need to be integrated and coordinated: health systems, zoonotic diseases, neglected tropical and vector-borne diseases, food safety, antimicrobial resistance, and the environment. The One Health approach allows for the development of structures to connect these domains, linking scientific evidence and risk assessment with the appropriate governance, legislation, capacity building and regulatory frameworks.

This Scientific Opinion considers how the EU can align with this initiative and incorporate key recommendations into its policies, improving coordination between different programmes focusing on food production and agriculture, environmental policies, and policies for animal and human health.

Having recognised the potential of the One Health approach, the Commissioner Kyriakides asked the Group of Chief Scientific Advisors to the European Commission – which together with the Science Advice for Policy by European Academies and a Commission secretariat, constitutes the Scientific Advice Mechanism – to provide a scientific opinion on One Health Governance in the EU.

The overarching question to be addressed is:

Considering a complex policy area, i.e. One Health, what forms of management and cross-sectoral collaborations are best suited to ensure that synergies, possible trade-offs, and unintended consequences are taken into account?

With the following sub-questions:

- How should One Health be defined in the EU context and what are the synergies with and demarcations to other approaches such as 'sustainability', 'One Planet' and 'Healthy Planet'? Which EU policies could significantly benefit from the implementation One Health approach?

- Which tools and leverage points for building capacities, planning and implementing One Health are most suitable for the EU level to

maximise synergies, consistency and coherence of interventions and avoid duplication of efforts?

- What are the criteria and the indicators that are most useful to assess the effectiveness of the tools and for monitoring the implementation of complex policies such as One Health? How can the progress in the EU policies which is due to the application of the One-Health approach be measured?

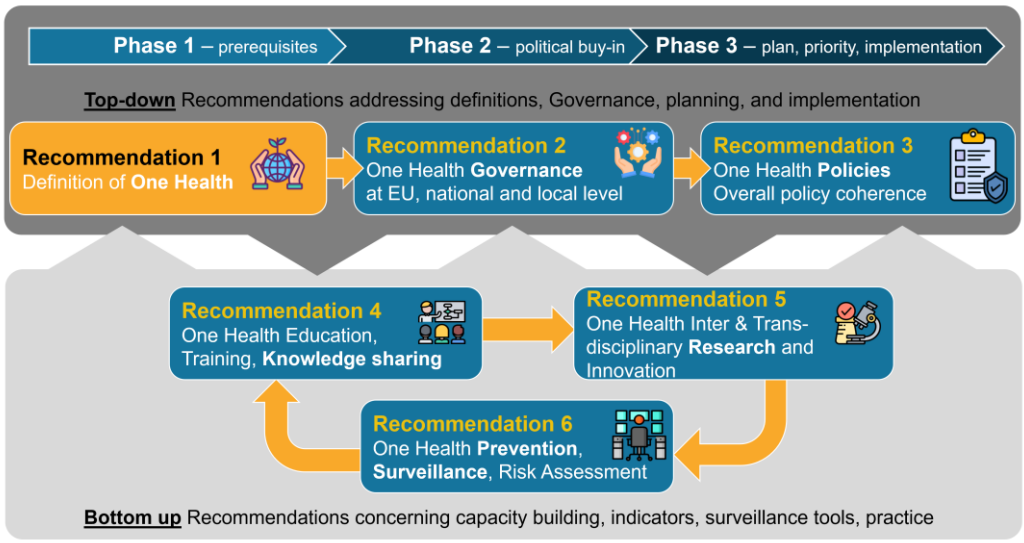
The opinion is informed by an Evidence Review Report by experts of the Science Advice for Policy by European Academies consortium, extensive literature reviews, and targeted workshops, and presents six recommendations.

These six recommendations build on existing structures and current initiatives at the regional, national, and European level. Together, the recommendations offer a roadmap on how to connect top-down governance and policies with bottom-up practical prerequisites, to increase the impact of current initiatives towards the implementation of move One Health.

Recommendation 1 (definition), Recommendation 2 (coordinated governance) and Recommendation 3 (policy coherence) highlight i) interrelated prerequisites that need to be met and ii) provisions that must be developed at the governance level in order to define, plan, and implement appropriate policies that follow the One Health definition.

Recommendation 4 (education), Recommendation 5 (transdisciplinary research), and Recommendation 6 (integrated infrastructure) focus on efforts needed to support and advance the developments around One Health.

Connecting One Health top-down and bottom-up initiatives should help integrate existing and new efforts in the planning of crucial infrastructures and policies. Emerging One Health developments and additional insights are essential for building capacity, and for the development, selection, and validation of criteria, indicators, and tools that can be used to implement the One Health concept in European policymaking.



Sketch showing the interdependencies of the six recommendations and the pathway to implementation of One Health concepts in European policy. Source: Nicole Grobert 2024

Recommendation 1

Use the OHHLEP definition as a basis for all future actions related to One Health

1.1. Convene European Commission services around the One Health concept with a view to setting out a collective One Health vision for Europe.

1.2. Support the Regional One Health Coordination Mechanism & One Health platforms that uphold the One Health definition.

Recommendation 2

Develop effective One Health Governance by working across silos and creating links at EU, national, and local levels

2.1 Create a High-level One Health coordination mechanism.

2.2 Strengthen Inter-institutional collaboration to develop an EU One Health strategy setting out ambitions and actions, supported at political level.

2.3 Arrive at a common vision of how the EU is to engage on One Health at the international level

2.4 Support the sharing of good One Health practices across EU at national, regional and local levels, and support the development of national One Health strategies with a view to their implementation

2.5 Ensure actions are supported by adequate resources and funding

2.6 Consider the establishment of a Multistakeholder Platform on One Health

Recommendation 3

Strengthen EU policies related to One Health and overall policy coherence

3.1 Develop a strategy with short-, medium- and long-term goals to match the United Nations' Theory of Change and adapt it to local, national, and European-wide needs

Recommendation 4

Support education, training and data and knowledge sharing

4.1 Integrate One Health concepts in professional and academic training at all levels

4.2 Support integration of the One Health principle in professional training

4.3 Utilise new technologies e.g. Artificial Intelligence and Virtual Reality for interactive and immersive learning and knowledge sharing

4.4 Promote public awareness of the One Health concept and practice

Recommendation 5

Support inter- and trans-disciplinarity in Research and Innovation on One Health

5.1 Identify and tackle the institutional and structural barriers that hinder inter- and transdisciplinary research collaboration in and across One Health-related domains

5.2 Ensure guidance, frameworks and incentives that facilitate R&I across disciplines and sectors, both in academia and in the private sector

5.3 Develop integrated models and Key Performance Indicators to assess effectiveness of One Health implementation

5.4 Support research in nexus and cross-cutting areas

Recommendation 6

Improve prevention, surveillance and risk assessment related to One Health

6.1 Integrate existing infrastructures for surveillance

1. INTRODUCTION

Europe has taken major steps following the COVID-19 pandemic and the challenges that it brought to our health systems and societies and economies. Since then, new threats and challenges have emerged, and prevention and resilience of health systems must be strengthened through appropriate health policies. At the same time, the UN speaks of a triple planetary crisis of climate change, nature loss, and pollution and waste.

Human health, animal health, and the health of ecosystems (including plants, bacteria and fungi) are inherently connected – they cannot be addressed in isolation but form a common system that demands to be treated as a whole.

Making these connections more explicit will help deliver a coherent policy matrix, in line with the priorities of the 2024-2029 Commission, bringing together actions on threats to health and the environment, and making them more cost-effective, as identified by the WHO[1] and detailed in the Evidence Review Report (SAPEA 2024).

The One Health concept and action plan complement the European Green Deal, which takes an integrated approach to protect, conserve and enhance the EU's natural capital, whilst also protecting citizen's health and wellbeing from environmental risks and impacts, e.g., through Zero Pollution.

An integrated approach to health is also in line with President von der Leyen's political guidelines, and the overarching message that the greatest challenges of our era can only be solved by joint action[2].

Potential gains of adopting a One Health approach to policymaking

The scientific case for the One Health approach has strengthened considerably in recent years, as the mutual dependencies between the

[1] WHO urges investing in "One Health" actions for better health of the people and the planet. WHO urges investing in "One Health" actions for better health of the people and the planet (who.int)

[2] Europe's Choice: Political guidelines for the next European Commission 2024-2029 (europa.eu)

human, animal and ecosystem health have become increasingly evident. In parallel, evidence about the benefits of taking account of these connections in policy making, and of developing societal structures to support this interconnectedness has continued to grow. The economic advantages of an integrated approach to One Health have also become more apparent.

In 2021, average EU healthcare costs were 10.9 % of GDP. This figure is set to rise as the population ages and new health technologies continue to appear[3]. The Evidence Review Report underpinning this scientific opinion (SAPEA 2024) shows various areas where investing in prevention of healthcare costs and promoting one health could bring multiple benefits, provided human health, the physical and built environment and animal health are considered in parallel. Examples include mobility infrastructures and health[4], and integrated laboratory infrastructure for animal and human health[5].

Another striking example of potential gains is the area of invasive species. In 2019, IPBES (the Intergovernmental Panel for Biodiversity and Ecosystem Services) put the global cost of biological invasions at over USD 423 billion, including damage to food chains and an increased burden of disease.

Some Member States and authorities at many levels are already practising aspects of One Health and have good practices to share. Greater recourse to One Health in policy making would lead to better coordination, integrated governance, an improved assessment of the risks and benefits of policies, better prevention schemes and the more efficient use of scarce resources. There are also clear benefits to One Health coordination approaches at the global level, as many health determinants have a global dimension.

Origins of the One Health concept

One Health is not a new concept. An integrated approach to health issues was proposed long before the name **One Health** was adopted, for instance, by the 19th-century German scholar and medical doctor Rudolf Virchow, a

[3] Healthcare expenditure statistics - overview - Statistics Explained (europa.eu)
[4] SSPH+ | Mobility Infrastructures and Health: Scoping Review of studies in Europe (ssph-journal.org)
[5] World Bank, 2010. People, pathogens and our planet: Volume 1: Towards a One Health approach for controlling zoonotic diseases. Report No. 50833-GLB, 56

pioneer of social medicine[6]. Over the past three decades, a large amount of evidence has emerged to strengthen the case for One Health, revealing for instance that more than 70 % of emerging infectious diseases among humans are of zoonotic origin.

Some trace the first formal use of the term One Health to 2003. The concept became more widely known during the emergence of the Severe Acute Respiratory Syndrome (SARS), and was amplified in the goal-oriented strategic "Manhattan Principles" of the following year[7]. The Manhattan Principles list 12 recommendations for a more holistic approach to prevent epidemic/epizootic diseases, along with respect for ecosystem integrity to benefit humans, their domesticated animals and the foundational biodiversity that supports life on Earth[8].

In the early 2000s, a related concept termed **One Medicine** promoted collaboration between the medical and veterinary disciplines to benefit both human and animal health[9]. One Medicine was typically framed around infectious diseases, but it also took account of their surrounding ecosystems. It advocated the promotion of human and animal healthcare with the support of relevant sectoral healthcare professionals collaborating to ensure that all species benefit from equal and sustainable medical progress. This approach necessarily incorporates a holistic approach to ecosystem health (**EcoHealth**)[10]. This shedding of the previously anthropocentric approach, and the broadening of consideration of relevant conditions to beyond the human medical context was an important step on the way to what we now consider One Health.

More recently the concept of **Planetary Health** emphasises that human health is influenced by planetary phenomena, such as climate change and

[6] Reed LD. The important interface between public health and veterinary medicine for improving human health, animal health, and food safety. Public Health Rep. 2008 May-Jun;123(3):257. doi: 10.1177/003335490812300301. PMID: 19006962; PMCID: PMC2289972.
[7] The Manhattan Principles (wcs.org)
[8] The One Health Approach—Why Is It So Important? Trop. Med. Infect. Dis. 2019, 4, 88
[9] Bresalier M, Cassidy A, Woods A. One health in history. In: Zinsstag J, Schelling E, Waltner-Toews D, Whittaker M, Tanner M, Stephen C, editors. One Health the Theory and Practice of Integrated Health Approaches. Oxfordshire, UK: CAB International; 2015. pp. 22–84
[10] Ancheta J, Fadaak R, Anholt RM, Julien D, Barkema HW, Leslie M. The Origins and Lineage of One Health, Part II. Can Vet J. 2021 Oct;62(10):1131-1133. PMID: 34602644; PMCID: PMC8439323.

biodiversity loss (SAPEA 2024, Horton et al. 2014). In 2021, the Planetary Health Alliance redefined planetary health as "a solutions-oriented, transdisciplinary field and social movement focused on analysing and addressing the impacts of human disruptions to Earth's natural systems on human health and all life on Earth"[11]. In 2023, de Castaneda et al (2023) performed a bibliometric analysis on One Health and planetary health, highlighting the continuity and complementarity between the concepts. The Evidence Review Report (SAPEA 2024) states that "Paradigms like "Environmental Health" and "Planetary Health" still focus on human health; in theory at least, One Health is distinguished by its potential to move away from such anthropocentrism."

The wider adoption of the term 'One Health' came about in Berlin in 2023, at the World Health Summit that brought together the group known as the **Quadripartite leaders** (the United Nations Food and Agricultural Organisation UNFAO, the United Nations Environment Programme UNEP, the World Health Organisation WHO, and the World Organisation for Animal Health WOAH). This summit saw health professionals, ministries and stakeholders for important public policy discussions all agreeing that all of these "Healths" (i.e. human, animal, plant, environment and ecosystem) need to come together to ensure that efforts towards One Health continue in an integrated manner, connecting ongoing scientific, economic, social, cultural and political advances.

As a result, the Quadripartite leaders now work together on the One Health High-Level Expert Panel (OHHLEP) to mainstream One Health. The OHHLEP enables the organisations to be prepared to prevent, predict, detect, and respond to global health threats and promote sustainable development.

At the international level, the One Health definition finds practical expression in the United Nations **One Health Joint Plan of Action** (2022–2026) (OH JPA) of the Quadripartite[12]. The Implementation Guide for this Joint Plan of Action[13] provides countries with a **Theory of Change**, with practical guidance on how to implement the One Health approach (endorsed in December 2023). A theory of change (ToC) is an explicit theory of how and

[11] PLANETARY HEALTH - Planetary Health Alliance (planetaryhealthalliance.org)
[12] One health joint plan of action (2022–2026): working together for the health of humans, animals, plants and the environment (who.int)
[13] A guide to implementing the One Health Joint Plan of Action at national level (fao.org)

why it is thought that a social policy or program activities lead to outcomes and impacts (Maine, 2017). ToCs are used in the design of programs and program evaluation, across a range of policy areas.

Box 1: The OHHLEP Definition of One Health

One Health is now regarded as a systemic, multisectoral, transdisciplinary approach which requires collaboration across local, regional, national, and global scales to achieve optimal health outcomes by recognising the interconnectedness of people, animals, plants and their shared environment[14]. This interconnectedness is complex, taking in the numerous interdependencies between living organisms (humans, animals, plants, microorganisms), soil (soil microbiome and the impact of pesticides, fertilisers etc.), food, water (and the influence of antibiotics, hormones, anti-depressants, microplastics), climate (crop health and yields, water accessibility and quality), industry processes and their direct effects on workers and the environment (e.g., manufacturing materials, chemicals, CO2 and methane emissions), as well as mental and physical stress that impact on chronic health outcomes and resilience of living organisms in their social and physical environments.
The OHHLEP adopted the following definition (OHHLEP 2022):
"One Health is an integrated, unifying approach that aims to sustainably balance and optimise the health of people, animals and ecosystems. It inherently recognises that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent."
The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for healthy food, water, energy, and air, taking action on climate change and contributing to sustainable development.
Key underlying principles include:
1) equity between sectors and disciplines;

[14] Importance of a One Health approach in advancing global health security and the Sustainable Development Goals, Rev. Sci. Tech. Off. Int. Epiz., 2019, 38 (1), 145–154.

2) sociopolitical and multicultural parity (the doctrine that all people are equal and deserve equal rights and opportunities) and inclusion and engagement of communities and marginalized voices;
3) socioecological equilibrium that seeks a harmonious balance between human–animal–environment interaction and acknowledging the importance of biodiversity, access to sufficient natural space and resources, and the intrinsic value of all living things within the ecosystem;
4) stewardship and the responsibility of humans to change behaviour and adopt sustainable solutions that recognize the importance of animal welfare and the integrity of the whole ecosystem, thus securing the well-being of current and future generations; and
5) transdisciplinarity and multisectoral collaboration, which includes all relevant disciplines, both modern and traditional forms of knowledge and a broad representative array of perspectives.

The scope and objectives of this opinion

The GCSA provides independent scientific advice to the European Commission to inform policymaking. The present opinion was requested by Stella Kyriakides, European Commissioner for Health and Food Safety. The background to this request and the specific questions to be answered by the advisors are laid down in the 'Scoping Paper' (Annex 3).

The overarching question put to the GCSA is:

Considering a complex policy area, i.e. One Health, what forms of management and cross-sectoral collaborations are best suited to ensure that synergies, possible trade-offs, and unintended consequences are taken into account?

A number of sub-questions also need to be addressed:

- How should One Health be defined in the EU context and what are the synergies with and demarcations to other approaches such as 'sustainability', 'One Planet' and 'Healthy Planet'? Which EU policies could significantly benefit from the implementation One Health approach?

- Which tools and leverage points for building capacities, planning and implementing One Health are most suitable for the EU level to

maximise synergies, consistency and coherence of interventions and avoid duplication of efforts?

- What are the criteria and the indicators that are most useful to assess the effectiveness of the tools and for monitoring the implementation of complex policies such as One Health? How can the progress in the EU policies which is due to the application of the One-Health approach be measured?

As noted in the scoping paper, the Advisors' goal must be to provide advice that gives a clear direction for the development of One Health policy at the level of the European Commission, which could then be operationalised and adapted in the EU Member States. This implies an understanding of the multiple scales required for One Health implementation, from the local to the national and in coordination with international levels.

This Opinion is based on the scientific evidence provided by the Science Advice to Policy by European Academies (SAPEA) consortium, which was tasked with developing a comprehensive and cross-disciplinary Evidence Review Report on this question with input from natural sciences, social sciences, and the humanities.

The advice also draws on additional literature reviews, the experience of the European Food Safety Authority (EFSA), European Centre for Disease Prevention and Control (ECDC), the European Environment Agency (EEA), the European Medicines Agency (EMA) and the European Chemicals Agency (ECHA) in developing multiagency collaboration, and the report of the EC Junior Professionals Project 'Operationalisation of the One Health approach across the EC' ("internal to the Commission, unpublished") and research conducted by the European Commission's Joint Research Centre (JRC).

2. SUMMARY OF THE POLICY BACKGROUND

The policy background for One Health is complicated by the question of divided competences. As set out in the Lisbon Treaty, in several areas relevant to One Health such as public health, education, civil protection and culture, the EU can only intervene to support, coordinate or supplement the actions of its Member States.

In other areas of shared competence, such as agriculture and environment, both the EU and the Member States can legislate and adopt legally binding acts. Member States exercise their own competence where the EU does not exercise, or has decided not to exercise, its own competence[15].

Despite the limited competences in public health, under the Lisbon Treaty and the Treaty on the Functioning of the European Union the EU can adopt human health legislation in certain areas[16], and has done so regarding patients' rights in cross-border healthcare, pharmaceuticals and medical devices (pharmacovigilance, falsified medicines, clinical trials), health security and infectious diseases, digital health and care, tobacco, and organs, blood, tissues and cells.

An additional approach the EU can take to support public health in the Member States is though the Council of the EU, which can address recommendations on public health to EU countries. For example, the Council issued updated recommendations on cancer screening[17], based on a proposal by the Commission that relied on a scientific opinion of the SAM[18].

In recent years, in response to crises like the various epidemics of the 21st century (particularly SARS in 2002, the H1N1 influenza epidemic in 2008,

[15] Articles 191 to 193 of the Treaty on the Functioning of the European Union (TFEU). 'Shared competence' means that both the EU and the Members States may legislate in a given area, and that the Member States can legislate for the aspects of that policies where the EU has not exercised its competence (Article 2 of TFEU). Special provisions within the EU environmental policy apply to measures affecting town and country planning, land use (with the exception of waste management) and management of water resources, where the EU Council is the sole legislator (acting unanimously and after consulting the European Parliament).

[16] See for example Article 168 (protection of public health), Article 114 (single market) and Article 153 (social policy) of the Lisbon Treaty

[17] Council Recommendation on strengthening prevention through early (europa.eu)

[18] Cancer screening in the European Union - Publications Office of the EU (europa.eu)

and COVID-19), the EU has made full use of all available powers, especially through the establishment of a health security framework.

The European Commission has been building a **European Health Union**, in which all EU countries prepare and respond together to health crises, medical supplies are available, affordable and innovative, and countries work together to improve prevention, treatment and aftercare for diseases such as cancer. The aim is to better protect the health of citizens by strengthening EU and Member State capacity to prevent and address future pandemics, while also improving the resilience of Europe's health systems[19]. This example of cross-regional, national and EU-level collaboration could serve as an inspiration for One Health practices, above and beyond preparations and responses to future health crises and pandemics.

The recent experience with crises and the response at EU level has led to the development of a stronger political will to commit to a One Health approach at the European level, as can be seen in the fight against antibiotic resistance and zoonoses. The One Health Action Plan against Antimicrobial Resistance[20] reflects a desire to take this priority to the global level. As a result, under Horizon Europe, the EU now funds numerous projects to combat antibiotic resistance in line with the 2023 non-binding EU Council recommendation of quantified targets for antibiotic use. The action against antibiotic resistance has been reinforced by the 2019 legislation on veterinary medicinal products, which is the world's most restrictive legislation on the use of antimicrobials in livestock farming. It is also a likely factor in Member States' support for the 50% reduction target in the use of antimicrobials in livestock and aquaculture by 2030.

Recent EU legal acts define One Health as a "multi-sectoral approach which recognises that human health is connected to animal health and to the environment, and that actions to tackle threats to health must take into account those three dimensions". In November 2020, the Council of the European Union and representatives from Member States adopted conclusions on the EU's role in strengthening the World Health Organisation (WHO). The document highlights, in a context of institutional reform, the importance of One Health for preventing and addressing health emergencies

[19] The European Health Union: acting together for people's health (europa.eu)
[20] A European One Health Action Plan against Antimicrobial Restistance (AMR) (europa.eu)

and encourages reflection on the institutional and organisational anchoring of the One Health approach at global level.

In addition, some components of food safety policy such as animal and plant health are already harmonised at the European level. EU legislation imposes common rules on disease control (monitoring, analysis, notification, eradication and vaccination programmes), and defines the biosafety measures to be implemented on farms and imposed on imports of products of animal origin.

Legislative Actions

In short, although the EU One Health policy landscape is currently somewhat fragmented, some policies already recognise interconnections, while others require new links to be created. Some targeted health policies do not require complex interlinkages. What follows is a short overview of existing policy areas and legislative actions that are relevant to One Health, and which provide for cooperation and collaboration between relevant sectors and disciplines such as agriculture, environment, human medicine, veterinary medicine, epidemiology and environmental sciences.

Cross-Border Health Threats

The **Regulation on Serious Cross-Border Threats to Health**[21] creates a robust legal framework to improve the EU's capacity in the areas of prevention, preparedness, surveillance, risk assessment, early warning, and response to all hazards, including rapid and appropriate recommendations for response measures. These aspects involve several EU delegated agencies: **ECDC, EFSA, ECHA, EEA, EUDA, Europol, European Medicines Agency**. These agencies have formed an **inter-agency task force**[22] to formalise global data gathering and response systems for future health threats, regardless of their origin and the mounting of appropriate

[21] Regulation (EU) 2022/2371 of the European Parliament and of the Council of 23 November 2022 on Serious Cross-Border Threats to Health and repealing Decision No 1082/2013/EU (Text with EEA relevance), PE/40/2022/REV/1

[22] Cross-agency knowledge for One Health action, Joint statement by European Union Agencies, European Centre for Disease Prevention and Control (ECDC), European Chemicals Agency (ECHA), European Environment Agency (EEA), European Food Safety Authority (EFSA), European Medicines Agency (EMA), 13 November 2023, https://www.efsa.europa.eu/sites/default/files/2023-11/one-health-2023-joint-statement.pdf

responses. In this way, they co-ordinate mutual strategic direction and policy support, research, stakeholder engagement and joint procurement and activities[23].

Zoonotic threats

Animal welfare, biodiversity, soil health, sustainable use of pesticides, climate and health, prevention, detection, and rapid response to future health emergencies are promoted by numerous measures. These comprise the **Farm to Fork Strategy (2020)**[24], the **Global Health Strategy (2022)**[25] and comprehensive legislation[26] with measures to promote animal health and prevent and control the spread of animal diseases. This extends to measures dedicated to specific aspects of BSE[27], meat hygiene[28] and foodborne diseases such as Salmonella[29].

Veterinary Medicinal Products

The **Veterinary Medicinal Products Regulation**[30] updates the rules on the use of veterinary medicines with links to other legislative measures and imposes a reduction in the use of antimicrobials in livestock.

[23] All news - ECHA (europa.eu)
[24] EU global health strategy: Better health for all in a changing world - Publications Office of the EU (europa.eu)
[25] Farm to Fork strategy (europa.eu)
[26] The main legal instruments are the Animal Health Law, Regulation (EU) 2016/429 and Directive 2003/99/EC of the European Parliament and of the Council of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC
[27] Regulation (EC) No 999/2001
[28] Regulations (EC) No 853/2004, No 854/2004 and (EU) No 2015/1375
[29] Regulation (EC) 2160/2003
[30] Regulation (EU) 2019/6 of the European Parliament and of the Council of 11 December 2018 on veterinary medicinal products and repealing Directive 2001/82/EC (Text with EEA relevance)

Chemicals

The **EU REACH Regulation**[31] aims to ensure the safe use of chemicals by requiring manufacturers and importers to assess and manage the risks associated with their products in all aspects.

Plant Health

The **Plant Health Law Regulation**[32] aims to protect the Union's territory and its plants and forests, ensuring safe trade and mitigating the impacts of climate change.

The European Green Deal

The **European Green Deal**[33] (including e.g. the **EU Climate Law**[34]) is a comprehensive plan to deliver a sustainable EU economy by turning climate and environmental challenges into opportunities in policy areas that include agriculture, food safety, climate change adaptation, biodiversity conservation, and antimicrobial resistance. It includes for the example the Farm to Fork strategy. The **8th Environment Action Programme (EAP)**,[35] which will guide European environmental policy until 2030, supports the objectives of the Green Deal and includes a mechanism for monitoring progress.

[31] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

[32] Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants, amending Regulations (EU) No 228/2013, (EU) No 652/2014 and (EU) No 1143/2014 of the European Parliament and of the Council and repealing Council Directives 69/464/EEC, 74/647/EEC, 93/85/EEC, 98/57/EC, 2000/29/EC, 2006/91/EC and 2007/33/EC

[33] The European Green Deal - European Commission

[34] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')

[35] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030

The EU One Health Action Plan against Antimicrobial Resistance[36]

This aims to reduce the unnecessary use of antibiotics in humans and animals, improve surveillance and monitoring of resistance, and promote research and innovation in this area, to help the EU play a leading role in the fight against antimicrobial resistance.

EU Decentralised Agencies and One Health

The effective implementation of a One Health approach at the European level will also require specific cooperation measures between the EU's **Decentralised Scientific Agencies**.

These specialist bodies have been set up to advise the European Institutions and the Member States in areas of their expertise that affect European citizens. Some are of particular relevance to One Health because they help implement binding rules and/or individual decisions with direct effect. This is the case for "regulatory" agencies like the **European Chemicals Agency (ECHA)** which has a major role in implementing the EU's Chemicals Legislation such as **REACH**[37] and the **CLP Regulation** on the Classification, Labelling and Packaging of chemical substances[38].

Some agencies provide technical or scientific opinions and/or inspection reports. This is the case for the **European Food Safety Authority (EFSA)**, the **European Centre for Disease Prevention and Control (ECDC)** and the **European Medicines Agency (EMA)**. Other agencies connect competent national authorities to gather, exchange and compare information and good practices – examples include the **European Environment**

[36] COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT A European One Health Action Plan against Antimicrobial Resistance (AMR) (europa.eu)

[37] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

[38] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance)

Agency (EEA), and the **European Centre for Disease Prevention and Control (ECDC)**.

In a similar manner to the inter-agency task force on One Health mentioned above, the **European Climate and Health Observatory**[39] facilitates actions and responses to climate-related health risks. It brings together many organisations including the **European Commission**, **the European Environment Agency**, **the European Centre for Disease Prevention and Control (ECDC)**, the **European Food Safety Authority (EFSA)** and other organisations such as the **Lancet Countdown in Europe**, and the **World Health Organisation Regional Office for Europe**.

Research Actions

The EU provides funding for numerous research and innovation projects that address health challenges from a One Health perspective. **Horizon Europe**[40], the **One Health European Joint Programme**[41] and the **European Partnership for the Assessment of Risks from Chemicals (PARC)**[42] all fund interdisciplinary research projects that explore the connections between human health, animal health, and the environment, as well as initiatives to develop new technologies and strategies for disease prevention and control.

Funding for One Health initiatives

Recent initiatives under Horizon Europe and EU4Health have demonstrated the EU's commitment to advancing the One Health approach. Horizon Europe funding, with its robust framework for supporting research and innovation, plays a pivotal role in fostering transdisciplinary cooperation. The integration of Horizon Europe funds with EU4Health – a programme dedicated to bolstering health systems and responding to cross-sector health threats –

[39] European Climate and Health Observatory
[40] Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013 (Text with EEA relevance)
[41] One Health EJP
[42] Partnership for the Assessment of Risks from Chemicals | Parc (eu-parc.eu)

illustrates the potential of funding to facilitate science-policy interface collaboration.

Programs like the Med-Vet-Net Network of Excellence and the One Health European Joint Programme have been instrumental in enhancing research cooperation on One Health topics.

The 2017 One Health Action Plan against Antimicrobial Resistance is a prime example of how EU-funded initiatives can bridge the gap between scientific research and policy implementation.

The European Commission Directorate-General for Health Emergency Preparedness and Response (DG HERA) receives a multi-source budget coming from different financial instruments including NextGenerationEU, EU4Health, Horizon Europe, the Union Civil Protection Mechanism, the European Defence Fund, the Recovery and Resilience Facility, REACT-EU, the Neighbourhood, Development and International Cooperation Instrument and support from Cohesion Funds. It also benefits from national budgets: "the mobilisation of private funding (in the form of loans, guarantees, equity or quasi-equity), supported by budgetary guarantees under InvestEU and the European Fund for Sustainable Development for external actions, in cooperation with the European Investment Bank Group and other financial actors." Emergency funding can be triggered through the Council via the Emergency Support Instrument (ESI).

Alongside DG SANTE, decentralised agencies contribute to the One Health framework (see above). Despite their critical roles, the need for more streamlined collaboration and funding mechanisms is evident, as highlighted in the 2023 Cross-agency knowledge for One Health action joint statement by the EU Agencies.

3. TOOLS AND LEVERAGE POINTS AT EU LEVEL

As noted above, most EU competences in public health policy are intended to help support, coordinate and supplement the competences of the Member States. Areas where the EU has stronger (i.e. shared) competence to act include policies in animal and plant health which have an impact of human health, the safety of medicines and medical devices, and major cross-border health threats, including monitoring and early warning.

Current EU public health policies are intended to:

- protect and improve the health of EU citizens
- support the modernisation and digitalisation of health systems and infrastructure
- improve the resilience of Europe's health systems, and
- better equip EU countries to prevent and address future pandemics.

These existing policies can be further expanded and connected to manifest the One Health approach. The case studies and literature reviews in the Evidence Review Report show that some initiatives that would align with the One Health approach are already well established, and that their positive impact has been apparent for some time. This is clearly the case for trichinosis, and antimicrobial resistance.

Nevertheless, the Evidence Review Report also identifies numerous gaps in current provisions. It notes in particular a focus that has so far been confined to infectious diseases, while a broader assessment of the benefits of One Health approaches is lacking. The Evidence Review Report underlines the importance of political ownership, clear governance structures, and dedicated funding as key leverage points to support the implementation of One Health interventions (SAPEA 2024).

One Health benefits exist in other contexts which take into account a broader selection of outcomes. Recent initiatives relating to One Health include the environmental domain for issues such as biodiversity loss, the effect of pollution on environmental, animal and human health, and the relations between climate change and health.

4. CRITERIA AND INDICATORS FOR MEASURING PROGRESS IN EU POLICIES RESULTING FROM THE APPLICATION OF THE ONE HEALTH CONCEPT

Linking policies relevant to the health of humans, animals, plants, and ecosystems is a highly complex process, involving a coordinated effort at local, national and global levels. A multidimensional transformation will be critical, bringing changes for policy, legislation, advocacy, funding, organisational structures, sectoral integration, research and innovation, and implementation.

Permanent monitoring, assessment and adaptation will be required to achieve objectives such as strengthening health systems, preparing for and responding to epidemics, integrating concerns for the environment into decision making about public health, and for assessing its impact on human, animal, and plant health. Specifying concrete indicators for One Health implementation may contribute to this effort.

Box 2: Pathways for the implementation of the One Health approach (OHJPA 2022)

In their One Health Joint Plan of Action, the Quadripartite provide three pathways to enhance the implementation of the One Health approach at the country level and suggest relevant indicators.

For the first pathway – policy development, regulatory frameworks, and financing – they suggest adopting communication and advocacy strategies, establishing dedicated funding mechanisms, and adapting policies, plans, and regulations. The adoption of a main policy framework for One Health is recommended, documenting priorities, institutional arrangements, coordination structures, and monitoring systems. A legal framework to operationalise One Health efficiency should also be established.

The second pathway – the implementation of One Health – involves scaling up capacity at national level, community engagement, multisectoral coordination, and the integration of different sectors. This approach requires setting up a coordination mechanism, multisectoral information-sharing, and

facilitating the contribution of many different sectors to One Health initiatives. The implementation of major One Health initiatives and emergency management programmes should be established, and the required capacity should be developed in national institutions.

The third pathway – research and innovation, scientific evidence and knowledge integration – requires generating data for evidence, technical tools and innovations, guidelines, and instituting surveillance systems. Typically, this encompasses disease surveillance and early warning systems, systems for sharing One Health intelligence, and regularly updating risk assessments (FAO, UNEP, WHO and WOAH, 2023).

There are a number of challenges in monitoring and evaluating One Health, as the current focus is mainly confined to the medical context and too little attention is paid to the social, economic, and climate contexts relevant to One Health. There are too few long-term studies, too few indicators for measuring outcomes, and a general lack of cost-effectiveness analyses and relevant evaluation studies. Missing elements to be developed or improved include standardised frameworks for the systematic evaluation and reporting of One Health outcomes, science-based evaluation protocols, standardised quantitative indicators, and studies that understand health as a quantitative and qualitative interaction and outcome process in socio-ecological systems (SAPEA 2024, Chapter 3, 2024; Ribeiro et al. 2019).

Both qualitative and quantitative indicators will be needed to guide and assess the operationalisation of One Health. Qualitative indicators should include the establishment of the appropriate leadership and coordination bodies, and the documentation of national plans for One Health issues including national integrated surveillance-response systems, the roles and responsibilities of coordinated One Health interventions, and the lines of communication for these interventions. The quantitative indicators should be based on statistical/mathematical assessments of cross-domain and cross-species health effects, and economic analyses including cost-effectiveness. Use of intersectoral approaches for health risk assessment and risk mitigation at the human-animal-environment interface may improve efficiency of surveillance and response.

Some relevant evaluation studies are already available. One cost-benefit analysis of the impact of vaccination campaigns in dogs in African countries demonstrates that coordinated dog vaccination may lead to elimination of

dog rabies in Africa, with substantial welfare gains (Table 4, SAPEA 2024, 2024, Bucher et al. 2023), although additional research will be required on how to apply such policies more broadly. Another analysis examines the integration of laboratory capacities for human and animal diseases in Winnipeg, Canada, showing the reduced costs and improved surveillance that resulted (The World Bank, 2012). A third study of public health and animal health surveillance in Emilia-Romagna, Italy, reveals substantial economic benefits in terms of estimated avoided costs resulting from the integration of health sectors (Paternoster et al. 2017).

OH implementation is clearly improved by the use of evaluation frameworks such as the International Health Regulations Monitoring and Evaluation Framework, or the FAO multisectoral evaluation tools for epidemiology and surveillance (SAPEA 2024, p. 67-77, 2024).

Box 3: Mental Health as a connecting pathway in One Health

Mental health in humans (like stress in plants and animals) is an essential pathway in One Health, connecting physical health outcomes (such as cardiovascular diseases, immune system functioning and vaccine effectiveness) to the broader environment. To take one recent example, mental health and wellbeing are still suffering from the COVID pandemic (itself caused by a zoonotic disease transferred from animals to humans), with marked impacts on the young[43] and their ability to participate in work and educational opportunities and contribute to the economy[44]. According to the Lancet Psychiatry Commission on Youth Mental Health, the mental health of emerging adults has been declining steadily over the past two decades (McGorry et al, 2024). Early diagnosis and rapid access to treatment should be prioritized, even more so as this increase of mental health problems comes with a substantial financial cost, estimated by the European Commission at 4 % of GDP in its Communication "A comprehensive approach to mental health[45]".

More generally, evidence is mounting about effects of global environmental changes on mental as well as physical health (Charlson et al. 2021). This has been explored in the context of climate change, where effects such as psychological stress, depression, anxiety, and increased addiction and

[43] The Mental State of the World Report 2022 (mentalstateoftheworld.report)
[44] Mental health of adolescents (who.int)
[45] A comprehensive approach to mental health - European Commission (europa.eu)

suicide rates due to floods and economic disruption have all been described, with the effects most predominant in vulnerable population groups (Bourque et al, 2014). Measuring mental health in this context is challenging, and more informative when quantified within broader concepts of health and wellbeing, including for example socio-economic factors (Weatherly et al. 2023). Population groups with strong ties to the place they are living may experience higher levels of emotional stress, as measured in the form of environmental worry, environmental distress, climate change worry, or ecoanxiety (Galway et al. 2019, Coffey et al. 2021). One Health interfaces such as ecosystem services or human-wildlife interaction may be affected by social inequities in policies and environmental exposures. To address these impacts on physical and mental health, the One Health approach should incorporate concepts from environmental justice, and disparities in access to nature in rural, suburban, and urban environments, incorporating a sensitivity to history, privilege, and knowledge of local conditions. More equitable One Health studies and policies will help all species to harvest the benefits (Murray et al. 2022).

5. POLICY RECOMMENDATIONS

The One Health concept is highly complex. This figure shows how the recommendations are tightly interconnected and mutually relate to each other each other.

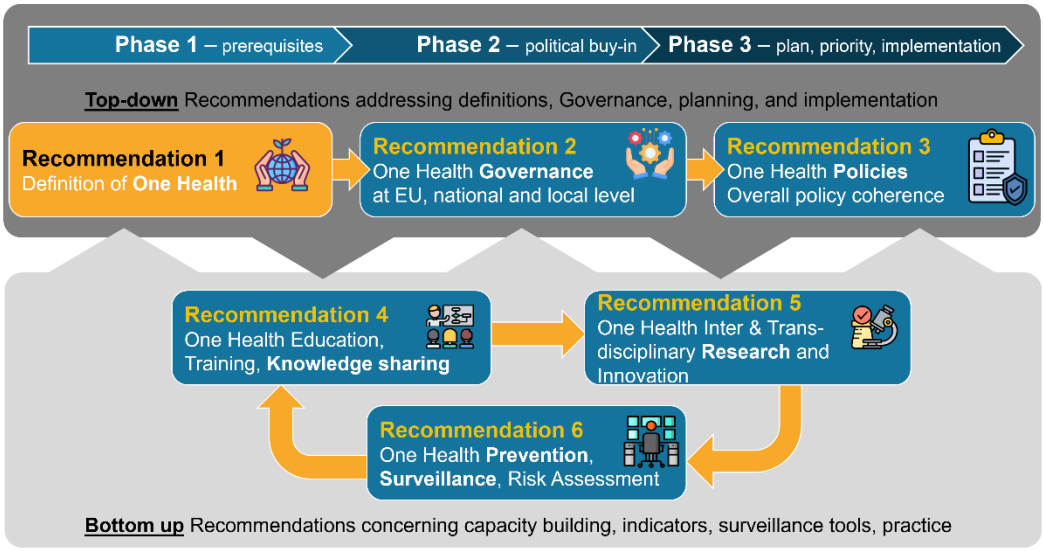


Figure 1: Sketch showing the interdependencies of the six recommendations and the pathway to implementation of One Health concepts in European policy. Source: Nicole Grobert 2024

Recommendation 1: Use the OHHLEP definition as a basis for all future actions related to One Health

A clear, unambiguous definition with consensus on the meaning and implications of the One Health concept is needed to operationalise and coordinate actions in local, regional, national and international policy. Adopting the OHHLEP definition (OHHLEP et al., 2022) would contribute to short-term benefits in achieving such coordination and medium-term benefits in supporting a broader approach to issues relating to health, with a greater focus on prevention. Its formal adoption by the European Commission would offer a unified basis for all future actions to sustain the health of all species and prevent the destruction of ecosystems, prevent climate change, maintain and improve biodiversity, improve animal welfare,

and protect watersheds from chemical contamination, plastic waste and other pollutants (this list is not exhaustive and requires a broader analysis on the basis of this definition).

The One Health approach mobilises multiple sectors, disciplines and communities at varying levels of society to work together to foster wellbeing and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development[46].

The GCSA recommends adopting the OHHLEP definition (see Box 1), as it is the result of in-depth, inclusive discussions and is already the basis for many initiatives at different (including international) levels.

The exact wording of the definition is discussed in the Evidence Review Report (SAPEA 2024). The OHHLEP definition (see Box 1) considers the health of humans, animals and ecosystems. It inherently recognises that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent. Ecosystems can be defined as "a holistic system comprising living and non-living entities that are both interconnected and interdependent." (SAPEA 2024). For SAPEA, "environment" covers ecosystems, but neither humans nor non-human animals; a non-exhaustive list would include plants, microbes, fungi, soil, waterways, the atmosphere, manufactured materials and chemicals, and the climate. An alternative definition could be "One Health is an integrated, unifying approach that aims to sustainably balance and optimise the health of ecosystems. It recognizes the health of humans, domestic and wild animals, and the environment". There is therefore still room for discussion on the exact wording. Despite that, it is clear that One Health concerns all of the elements listed above, including human and animal health.

It goes beyond the medical context and the short-term focus on outbreak and treatment of diseases. It is built on evidence that reveals the importance of balance between sectors and disciplines, socio-political and multicultural parity (the doctrine that all people are equal and deserve equal rights and opportunities) and inclusion and engagement of communities and

[46] One health (who.int)

marginalized voices. It implies that policies impacting on different contexts beyond the medical context need to be taken into account, and that a short-term focus on detection and treatment of diseases needs to be complemented with a medium-term perspective on social and economic conditions that impact the health of plants, animals and humans. A long-term perspective is also needed to demonstrate how the overall conditions of air, soil, water and climate have an impact on resilience and vulnerability of all living organisms.

This approach acknowledges the importance of a socio-ecological system, seeking a harmonious balance between human–animal–environment interactions and research documenting the importance of biodiversity, access to sufficient natural space and resources, and the intrinsic value of all living things within the ecosystem. It is founded in governance approaches that highlight stewardship, the responsibility of humans to change their behaviour and adopt sustainable solutions that recognize the importance of animal welfare and the integrity of the whole ecosystem, and in economic analyses focused on securing the wellbeing of current and future generations of plants, animals, and humans. The key to this approach is transdisciplinary and multisectoral collaboration, which includes all relevant disciplines, both modern and traditional forms of knowledge and a broad representative array of perspectives.

This link between health and wellbeing reflects the views of the WHO, where wellbeing is defined as encompassing "quality of life and the ability of people and societies to contribute to the world with a sense of meaning and purpose. Focusing on wellbeing supports the tracking of the equitable distribution of resources, overall thriving and sustainability. A society's wellbeing can be determined by the extent to which it is resilient, builds capacity for action, and is prepared to transcend challenges[47]". Human wellbeing depends crucially on environmental services, and thus on the wellbeing of nature.

1.1 Convene European Commission services around the One Health concept with a view to setting out a collective One Health vision for Europe

The EU Health focus has been centred on the medical context and on initiatives for the surveillance of zoonosis, infectious diseases and

[47] WHO Health Promotion Glossary 2021

antimicrobial resistance. However, the 2023 Council Recommendations on antimicrobial resistance acknowledge the role of the environment and call for an inclusive process where elements such as integrated surveillance encompassing environmental factors should be considered. To reap the full benefits of One Health, the focus needs to be extended towards the prevention of long-term adverse effects on the health, resilience and recovery potential of all living organisms from a wide variety of threats. In some situations, these threats range from climate change, environmental stressors, whether biological, chemical or physical, and biodiversity loss to changes in the social environment that can create stress, loneliness, anxiety, poverty and depression (all of which impact the functioning of the immune system), and interventions such as vaccine effectiveness, cardiorespiratory system, and mental health.

Together with the definition of One Health, the High-Level Expert Panel also developed a 'Theory of Change'[48] and a Joint Plan of Action to guide its work. This framework is designed to help other organisations, agencies and initiatives working towards similar goals. As well as facilitating an in-depth exploration of values, beliefs and how change happens, the Theory of Change analyses stakeholders, systems and power to ascertain where organisations can collaborate and partner together for the greatest added value. It offers a common narrative that reflects organisational values, models and approaches to achieving the best possible impact. Adopting a version of this Theory of Change would speed up the implementation of One Health at the EU level.

1.2 Support the Regional One Health Coordination Mechanism & One Health platforms that uphold the One Health definition

In order to ensure that the OHHLEP definition of One Health applicable at international level remains a living commitment and keeps pace with developments as new science, evidence and understanding emerge, a Technical Advisory Group (TAG)[49] for One Health has been formed at the WHO Regional Office for Europe and Central Asia (aka "WHO Europe") on the matter. It reviews progress, evaluates and provides guidance on how One Health is operationalised in this region of the WHO. This means identifying

[48] One Health Theory of Change (who.int)
[49] Technical Advisory Group (TAG) for One Health (who.int)

major strategic, scientific, structural, and technical challenges and opportunities. It also suggests priority research questions and innovative approaches to operationalise One Health and reviews and advises WHO Europe on engagement in partnerships so as to enhance impact at its individual Member State levels.

This operates through its Regional One Health Coordination Mechanism (ROHCM)[50] with Regional One Health Partner Platforms which bring together multiple partners and stakeholders from various sectors and backgrounds to provide strategic advice and coordinate the implementation of the One Health approach in Europe and Central Asia.

Recommendation 2: Develop effective One Health Governance by working across silos and creating links at EU, national and local levels

Since effective governance determines how professionals and representatives of respective sectors can and will work together efficiently, a common conceptual framework at European level (as indicated in Recommendation 1) will support the standardisation and harmonisation of approaches that will strengthen One Health systems and tools development[51]. Coherent governance will make efforts towards the One Health objectives more effective and will ensure that outcomes attained are of the highest quality with low cost to ensure the best possible return on investment. Working across silos and connecting governance at EU, national and local levels allow for efficient and equitable allocation of resources, the implementation of policies and regulations guiding delivery, and consistent mechanisms to monitor, evaluate, and review their implementation.

This recommendation aligns with recent trends in approaches to policymaking that emphasize 'policy coherence' (coordination of multiple policy goals), 'policy integration', 'mission-oriented policies', 'innovation portfolio management' (managing across policy projects), and 'strategic agility' (flexibility, inclusion and responsiveness to change). It requires commitment by political leaders and greater collaboration between

[50] Regional One Health Coordination Mechanism for Europe (who.int)
[51] Pelican, K., et al. (2019). "Synergising tools for capacity assessment and One Health operationalisation." Revue scientifique et technique (International Office of Epizootics) 38(1): 71-89.

departments to enable agenda setting and decision making, coherent implementation and evaluation, and flexible responsiveness to changing circumstances. One example that could serve as an inspiration here is the Quality of Administration 'toolbox' developed on behalf of the EC's Inter-Service Group on Public Administration Quality and Innovation (European Commission, 2017), which highlights a fundamental shift in the underlying model of public administration over the last 30 to 40 years from a traditional, hierarchical model, to 'New Public Management' and, most recently, towards more strategic agility.

2.1 Create a High-level One Health coordination mechanism

There has been a discernible shift towards greater institutional recognition of the need for an integrated approach to human, animal and ecosystem health, perhaps strengthened by the impact of the Covid-19 pandemic, and this process needs to be reinforced and improved.

To ensure endorsement at top leadership level, all relevant Commissioners and Directorates General should be involved. This requires collaboration between different policy areas at the level of the European Commission, mainly but not limited to human health, animal health, agriculture, food, climate and the environment.

The first steps in the development of appropriate governance structures at Commission level could take various forms, from an interservice group or task force to a steering group. However, we recommend that DG SANTE coordinates a core group involving at least Directorates General AGRI, ENV, HERA, CLIMA and the SG that liaises with the One Health groups and structures at national, European and international levels. This core group could further support a One Health platform (see recommendation 2.6) modelled on the European Climate and Health Observatory.

2.2 Strengthen Inter-institutional collaboration to develop an EU One Health strategy setting out ambitions and actions, supported at political level

The objective here is to create a culture to encourage the discussion of new ideas, development of policy and implementation of the One Health concept. These would ideally originate in programmes supported by existing

permanent structures[52]. One example of this action which is already happening at EU level is the delegated or decentralised EU agencies inter agency task force on One Health[53]. This involves the European Centre for Disease Prevention and Control (ECDC), the European Chemicals Agency (ECHA), the European Food Safety Authority (EFSA), the European Environment Agency (EEA) and the European Medicines Agency (EMA). These agencies of the European Union are specialist bodies that advise both the European Institutions and Member States in areas of their expertise that affect EU citizens, providing services, information and know how. Each of them reports to one or more supervisory Directorates-General of the Commission. This specific task force has identified a series of priority work areas common to all of them in the One Health domain to strengthen inter agency collaboration, including mutual strategic direction and policy support, research coordination, stakeholder engagement, and joint procurement and activities[54].

A One Health platform at Commission level (see Recommendation 2.1) could encourage discussions on One Health within the existing Council and European Parliament groups and structures, also considering the global dimensions.

2.3 Arrive at a common vision of how the EU is to engage on One Health at the international level

The EU should continue to support international initiatives that serve to anchor and uphold the definition and further develop and implement One Health. These include the Quadripartite and their Joint Action Plan, OHHLEP and the Technical Advisory Group (TAG) for One Health that has been formed at the WHO Regional Office for Europe and Central Asia on the matter.

One example of such an initiative is the process for an international agreement on pandemic prevention, preparedness and response within the

[52] Hitziger M, Esposito R, Canali M, Aragrande M, Häsler B, Rüegg SR. Knowledge integration in One Health policy formulation, implementation and evaluation. Bulletin of the World Health Organisation 2018; 96: 211-218
[53] Cross-agency knowledge for One Health action, Joint statement by European Union Agencies, European Centre for Disease Prevention and Control (ECDC), European Chemicals Agency (ECHA), European Environment Agency (EEA), European Food Safety Authority (EFSA), European Medicines Agency (EMA), 13 November 2023, https://www.efsa.europa.eu/sites/default/files/2023-11/one-health-2023-joint-statement.pdf
[54] All news - ECHA (europa.eu)

framework of the WHO[55]. In 2022 the European Council tasked the Commission with the negotiations on behalf of the EU. The zero draft of the accord specifically mentioned a One Health approach to tackle antimicrobial resistance and a whole-of-government and whole-of-society approaches to control zoonotic outbreaks. Most recently, the Political Declaration – 'A Global Commitment to Combat Antimicrobial Resistance (AMR)' was approved at the UN General Assembly on 26 September and adopted on 7 October 2024.

A One Health approach is also implicit if the global community is to achieve the 2030 UN Sustainable Development Goals (although the term is comparatively absent from recent declarations by the UN General Assembly and the High-level political forum for sustainable development[56]). The EU could support the further integration of One Health concepts in sustainable development actions, as well as the actionable integration of the environmental aspects in One Health approaches.

One Health approaches are also very relevant for initiatives on food safety and security. The Farm to Fork Strategy, a cornerstone of the Green Deal[57], does not refer explicitly to One Health, but offers a critical link between animal and human health and environmental policy. "In terms of a complementary EU humanitarian and development policy response, it calls for the link between public health and biodiversity to be taken into account, in line with the One Health approach[58]". In this way, the Commission services will be better able to combine efforts with the international and European community to address food sustainability and security in Europe and internationally.

2.4 Support the sharing of good One Health practices across the EU at national, regional and local levels, and support the development of national One Health strategies with a view to their implementation

Approaches to policy implementation and governance include multi-level governance, including vertical and horizontal coordination. This requires

[55] Pandemic prevention, preparedness and response accord (who.int)
[56] UN General Assembly: High level political forum for sustainable development
[57] European Green Deal. Available at https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[58] European Parliament resolution of 6 July 2022 on addressing food security in developing countries (2021/2208(INI)).

coordinated leadership and clear pathways of communication and coordination between local, regional and national governments and EU and intergovernmental institutions. Countries with integrated approaches to disease outbreak preparedness for human and animal health and National Action Plans for threats such as Antimicrobial Resistance are more likely to have key governance structures in place for successful implementation of a One Health approach[59].

It is important to develop good practices which include strategies, approaches and/or activities that have been shown through research and evaluation to be effective, efficient, sustainable and/or transferable, and reliably lead to a desired result. They can take the form of guidelines or working standards for example and can be used and disseminated in place of or next to international standards and codes. The Evidence Review Report presents case studies for successful strategies like integrated West Nile Virus surveillance in Italy and urban One Health strategies like the Cities network (URBACT), but it also notes that there has been a too narrow focus on infectious disease and a lack of assessment.

Examples for Coordination at the regional and local Level, Multi-Sectoral Collaboration, and Capacity Building are listed below:

- **Promote Coordination at the regional and local level**

Although One Health is all-encompassing, choices still need to be made, including through regional prioritisation. Coordination between local, regional and national governments and EU and intergovernmental institutions is essential. Different networks and actors at the regional level include DG REGIO, the Committee of the Regions, the European Regional and Local Health Authorities (EUREGHA), the WHO Regions for Health Network.

EU funding of initiatives and programmes that support cooperation on sustainability at city level should be connected to One Health. The New

[59] Amri et al. (2022) An umbrella review of intersectoral and multisectoral approaches to health policy. Social Science and Medicine. Available at https://www.sciencedirect.com/science/article/pii/S0277953622007754?via%3Dihub

European Bauhaus[60] and the Cities mission[61] could support One Health on the local level, as health care and a healthy environment are highly dependent on local and urban action. The programme URBACT[62] aims to unify efforts for bringing One Health in cities through the One Health 4 Cities network.

- **Support multi-sectoral collaboration**

A diverse range of stakeholders, including government agencies, non-governmental organizations (NGOs), academic institutions, private sector entities, and local communities need to be engaged through "multi-disciplinary and multi- sectoral One Health task forces, technical committees, working groups and appoint Focal Points for specific activities may strengthen One Health initiatives"[63]. These would comprise representatives from health, agriculture, environment, wildlife, and other relevant sectors and take the form of regional committees to coordinate One Health activities. These committees should include representatives from all relevant sectors and require strong leadership and political, institutional and financial will.

Such groups could support research, surveillance, and control measures that exceed the capacity of individual countries, as well as engaging local communities in One Health initiatives through education and awareness-raising campaigns.

- **Enhance capacity building**

Since educational establishments are often based at regional levels, training programmes can be efficiently developed and conducted for professionals across sectors to build capacity in One Health principles and practices, along with appropriate technical assistance and resources that are often not available elsewhere. Data management can be effectively coordinated at higher levels so as to conduct risk assessments to identify and prioritise health threats which may be evolving into more than purely local events. In

[60] New European Bauhaus: beautiful, sustainable, together. - European Union (europa.eu)
[61] Climate-neutral and smart cities - European Commission (europa.eu)
[62] Unifying Efforts for Bringing One Health in Cities (urbact.eu)
[63] Accelerating one health in Asia and the Pacific | ESCAP (unescap.org)

this way, coordinated response plans can be established to manage and mitigate them, including outbreak response and disaster preparedness.

2.5 Ensure actions are supported by adequate resources and funding

All governmental agencies – local, regional, national and international – play a crucial role in funding One Health initiatives. They are uniquely positioned to address the overlapping requirements of public health, environmental conservation, and animal welfare policies. Public funding is typically the most stable and substantial investment for foundational One Health activities such as disease surveillance networks, public health training programs, and emergency response capabilities. While public funds are generally stable and predictable, they are subject to the vicissitudes of political and economic conditions.

Funding from governmental bodies may originate at local, regional, national, or international levels. Locally and nationally, funds are commonly allocated through health departments, environmental agencies, and agricultural departments. Internationally, entities such as the World Health Organisation and the European Union facilitate cross-border One Health initiatives, supporting research, surveillance, and control measures that exceed the capacity of individual countries.

2.6 Consider the establishment of a Multistakeholder Platform on One Health

In line with the integrated, holistic approach reaching across multiple sectors as described for One Health, the recommendations for One Health address actions that are needed in each domain and should by their nature involve **all key players** from the public and private sectors. These can be most effectively and efficiently implemented by establishing a multi-stakeholder platform, such as ClimateADAPT[64] or the EU Platform on Food Losses and Food Waste[65]. These on-line platforms help users access and share data and information, mainly by providing on-line information, data, links to other relevant organisations, educational material, etc., but also through creating

[64] https://climate-adapt.eea.europa.eu/en
[65] EU Platform on Food Losses and Food Waste: Key reports and deliverables - European Commission (europa.eu)

networks and partnerings. They can be hosted by a single entity, or the hosting can be shared by different DGs and agencies.

There are many networks, projects and structures related to One Health at regional, national, European and internation level. Mapping these elements and providing them with an interface for communication would help improve the prioritisation and equitable distribution of existing resource allocations, and help establish more egalitarian networks that encompass the breadth of One Health issues, serving communities most affected by emerging, re-emerging, or endemic threats at the human- animal-environment interface (Mwatondo et al 2023).

Training programmes provided via such a platform could enhance understanding across sectors. Raising awareness about the importance of One Health among policymakers, businesses, and the public could thereby be increased, since knowledge and awareness of the scope of One Health remains a major limitation at present (Chiesa et al. 2021)[66].

[66] Chiesa, F., et al. (2021). "A Survey on One Health Perception and Experiences in Europe and Neighboring Areas." Frontiers in Public Health **9**.

Box 4: Pesticides - an example of One Health interconnections

Producing enough food for the human population whilst also maintaining a healthy environment is a key challenge for humanity. The use of pesticides, and of intensive agriculture, is often directly or indirectly harmful to human health and they frequently affect common goods like clean water and air and biodiversity. Therefore, there are important trade-offs to be considered in the use of pesticides.

A briefing by the European Environment Agency summarizes the latest knowledge on how chemical pesticides impact human health and the environment and presents good practices to reduce their use and risk across Europe[67]. It states that the use of chemical pesticides presents a quintessential 'One Health' challenge: their widespread use impacts human, animal and ecosystem health, as well as food security, in multiple and interacting ways, but these interactions are not yet sufficiently reflected in the EU policy landscape. As a result, pesticide use is currently a driver of biodiversity loss.

At present pesticides must be authorised according to the regulation concerning the placing of plant protection products on the market[68]. The criteria for authorisation include the impact on human health, the fate and behaviour of the chemicals in the environment, but not the impact on biodiversity or the combined effect of different pesticides and other chemical pollutants.

Taking the interconnections between human, animal and environmental impact of pesticides into consideration should be essential in both pesticide research and policy development, to prevent associated risks or to handle them in an appropriate manner.

[67] How pesticides impact human health and ecosystems in Europe — European Environment Agency (europa.eu)
[68] Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (europa.eu)

Recommendation 3: Strengthen EU policies related to One Health and overall policy coherence.

One Health governance has implications for agricultural, health and environmental policies of the European Union and its Member States, including for example the Common Agricultural Policy (CAP), the Green Deal, the Farm to Fork Strategy, the Biodiversity Strategy and the Cross-agency (ECDC, ECHA, EEA, EFSA, EMA) frameworks for action.

The Evidence Review Report (SAPEA 2024) reviews the strengths, weaknesses, opportunities and threats (SWOT analysis) of policies in relation to the One Health governance in Europe. Although some policies have a narrow remit and will not benefit from a systemic approach, many would benefit from transdisciplinary collaboration. This includes developing context-specific approaches to achieving intersectoral collaboration and political cooperation. Areas of particular focus for One Health are:

a) Health (including animal and plant health)

b) Chemicals

c) Environment and climate

d) Food and agriculture (including food safety and nutrition)

e) Research and Innovation

f) Trade

g) Regional, urban and rural development

h) Education

We call for a further integration of the One Health approach from the early stages of policy development.

3.1 Develop a strategy with short-, medium- and long-term goals to match the United Nations' Theory of Change and adapt it to local, national and European-wide needs

Today, strong, effective and evidence-based preventive measures for health-related problems at EU level are for the most part focused on communicable diseases in humans and on mitigating the effects of climate change. To fully optimise human, plant and environmental health in the context of One Health, it will be necessary to also leverage social and behavioural sciences, health promotion, health literacy, health education, behaviour change, while also taking socio-economic risk factors and mental health into account.

To facilitate this process, and following on from the 'Theory of Change' proposed for adaptation at the EU level in Recommendation 1.2 above, and from the Evidence Review Report (SAPEA 2024), the following goals and outcomes are amongst others proposed for consideration at the EU level:

For the **short** term:

- Integration of existing policies and infrastructures so that e.g. human medical epidemiologists and veterinarians work can together in specific and pressing areas (AMR, zoonoses). For example, Health Security[69], Horizon Europe Strategic Plan[70], Animal Health Law[71], EU4Health programme[72], EU Strategy on Climate Change[73] and EU One Health Action Plan against AMR[74] are examples of EU policies with specific relationships with One Health and related to human, animal and environmental health. One example of such integration that is action already happening is the delegated or decentralised EU agencies inter agency task force on One Health, as described above.

- Improved surveillance of emerging pathogens and monitoring of identified priority drivers.

- Improved One Health coordination mechanisms to enhance collaboration, communication, and capacity building at different levels of society.

[69] EU Initiative on Health Security (europa.eu)
[70] Horizon Europe strategic plan 2025-2027 - European Commission (europa.eu)
[71] Animal Health Law - European Commission (europa.eu)
[72] EU4Health - European Commission (europa.eu)
[73] EU Adaptation Strategy - European Commission (europa.eu)
[74] A European One Health Action plan against Antimicrobial Resistance (AMR) (europa.eu)

- Sufficient funding in place for key One Health plans and improved coordination of global One Health financing
- Integration of mental health into all programs related both to physical health and wellbeing.

For the **medium** term:

- Establish an integrated surveillance, preparedness, and response system (including AMR, climate and environment).
- Improved ability to prevent, detect and respond to zoonoses and other cross-sectoral health threats including public health threats of unknown aetiology.
- Alignment of agencies' individual surveillance and early warning systems with the One Health concept.
- Improved stewardship and equitable access to diagnostics, vaccines, therapeutics and other technologies for the control of human, animal and plant diseases
- Implement concrete and ambitious initiatives for mental health promotion and prevention of mental illness by harnessing the actions described above.
- Demonstrated return on investment and reduced economic impact from One Health-relevant threats.

For the **long**-term:

- Sustainable livestock and agricultural development with improved animal welfare and improved food safety and food/nutrition security
- Improved ecosystem protection and management including wildlife, biodiversity, energy security, rural and urban development
- Enhanced resilience of communities through better disease prevention.

Recommendation 4: Support education, training, data, and knowledge sharing.

There is now a strong scientific consensus on the existence and relevance of interdependencies between the health of humans, domestic and wild animals, plants, and the wider environment. However, this knowledge is not generally shared by citizens or non-medical decision makers. Health is often approached from a far more narrow and traditional perspective, emphasising short term diagnosis and treatment of conditions in the medical context.

The concept of One Health implies a significant shift away from the current concept of human health being considered in isolation, and a dramatic change in thinking will be required for a broad range of citizens, professionals and policymakers. The first step in this direction should be through education, research and in particular popularisation of One Health research. This education and training should not be restricted to knowledge gathering and awareness raising but should be tailored to the needs of different target groups. If the processes and interconnections within life on Earth are better known, there will be increased awareness of key risks and indicators that are not commonly seen as relevant to health and correspondingly greater support for One Health policies.

The EU (through e.g. the on-line platform proposed in recommendation 2.6, the Executive Agencies, the Joint Research Centre and so forth) can contribute by collecting and making available relevant evidence and scientific insights that support the One Health concept, and making this information accessible to a broad group of citizens and professionals.

4.1 Integrate One Health concepts in education and training at all levels

The One Health concept should be included in education and training programmes, from kindergarten educational and academic institutions to training in professional settings such as public health institutions. This should cover issues such as understanding the complexity of the human-animal and environment system and basic concepts of the inter- and transdisciplinary nature of One Health. The curricula should comprise interdisciplinary study programmes and include methods to develop key performance indicators and tools to evaluate One Health and assess benefits of integrated OH approaches (SAPEA 2024, p.. 132, 2024).

4.2 Support the integration of One Health principles in professional training

There are some good examples already in place which could replicated elsewhere. One example is the training on antimicrobial resistance, zoonoses control and foodborne diseases through the Better Training for Safer Food (BTSF) initiative of the European Commission[75]. The BTSF initiative features a dedicated One Health pillar, which covers a number of issues relevant to One Health. BTSF training courses promoting the One Health approach and raising awareness on combatting AMR are also available for countries outside the EU. Other topics that could be addressed include preventing and recognising zoonoses, urban development and architecture and health, sustainable and healthy diets, etc.

4.3 Utilise new technologies like Artificial Intelligence and Virtual Reality for interactive and immersive learning and knowledge sharing

Digital technologies like Artificial Intelligence, Virtual Reality, big data and related technologies could enable better responses to the global human, animal and plant health challenges that appear in the context of One Health. These technologies can provide deeper and more rapid insights along with better predictive models of these challenges which in turn can help deliver better public health measures, and preventive strategies that are more targeted and precise.

Their deployment however will not be straightforward. The data landscape is fragmented and access to certain types of data is increasingly restricted as individuals, communities and countries seek to assert greater control over data harvested from them.

Data sharing across key One Health knowledge and data domains needs to be designed, so that tailor-made data-driven solutions can be found. This may also require the creation of an interdisciplinary workforce to deliver and implement such solutions. All genetic resources and data, including Digitally Sequenced Information, should be made available, in line with FAIR principles of Findability, Accessibility, Interoperability, and Reusability, with

[75] Better Training for Safer Food (BTSF) academy (europa.eu)

a focus on the fair and equitable sharing of benefits and, most crucially for a multi-disciplinary workforce, the use of multilateral approaches to data sharing (through federated data One Health Digitalisation systems, for example[76]) and to Access and Benefit Sharing (ABS).

4.4 Promote public awareness of the One Health concept and practice

A more widespread understanding of One Health could contribute to lifestyle improvements and better public health. This includes, for example, a better understanding of the links between the physical and socioeconomic environments and mental health issues such as burnout in employed populations, depression and anxiety in adolescents and stress. These can also be linked with obesity and diabetes in impoverished populations, undiagnosed specific diseases and health risks in cultural minorities and migrant populations, combating inappropriate diagnosis, medication and the treatment of women, and prevention of ill health in general. It should address risk behaviours, assess the risk related to the types of behaviour, and raise awareness among the public.

Recommendation 5: Support inter- and trans-disciplinarity in Research and Innovation on One Health

Evidence for the existence and importance of One Health is clear and unequivocal, but more research is still needed to unravel further specific pathways that lead to diseases, links between environmental factors and health, validate monitoring instruments, and develop effective therapies.

In line with the findings of the Evidence Review Report, we recommend that future research should focus on interdisciplinary collaboration, developing evaluation mechanisms, and promoting cross-sectoral dialogue and collaboration to enhance the effectiveness and sustainability of integrated health approaches within the One Health framework[77]. It should support the

[76] Ho CW-L (2022) Operationalizing "One Health" as "One Digital Health" Through a Global Framework That Emphasizes Fair and Equitable Sharing of Benefits From the Use of Artificial Intelligence and Related Digital Technologies. Frontiers in Public Health 10:768977. doi: 10.3389/fpubh.2022.768977
[77] SAPEA 2024 (Fajiue et al. 2024).

integration of knowledge and data through the standardisation of methodologies and data formats and explore strategies for policy integration.

5.1 Identify and tackle the institutional and structural barriers that hinder inter- and transdisciplinary research collaboration in and across OH-related domains

The interdependence of humans, animals, and their environment calls for inter- and transdisciplinary research, policy and implementation, using a holistic approach that integrates perspectives from human and veterinary medicine as well as from the humanities, and social and natural sciences. Interdisciplinary collaboration should take account of geographical and structural differences between EU and low- and middle-income countries, where innovative solutions have been deployed. Other challenges to be addressed include the need to find a common scientific language across disciplines, and the difficulty of integrating differing views on the relative importance of quantitative and qualitative research (SAPEA 2024. P. 25-27, 2024).

Transdisciplinary approaches and collaborations should include non-academic contributions which also serve to enhance community engagement. There may be institutional or cultural barriers to these advances, and these will need to be addressed. When designing inter- and trans-disciplinary collaborative frameworks, equity between the different sectors involved should be included from the outset.

Engagement with public and community groups can be transformative. Collaboration with and knowledge of local communities and the people affected may lead to the adoption of One Health approaches in a contextualised manner resulting in more productive outcomes, including for example through a more wide-spread recognition of win-win situations.

5.2 Ensure guidance, frameworks and incentives that facilitate R&I across disciplines and sectors, both in academia and in the private sector

Guidance will be needed to address the collaboration and implementation challenges of One Health. As diverse disciplines (including social and behavioural science on governance issues, decision making, and the achievement of behavioural change) and stakeholders will be involved, it may prove challenging to coordinate the development of these guidelines, which should also cover monitoring and evaluation. Guidelines backed by

robust scientific evidence will facilitate the execution of One Health initiatives (SAPEA 2024, p. 61-62, 2024).

Strategic research frameworks should be further developed, consisting of joint research and integrative projects that use data from human, animal, and ecological/environmental data sources. Partnerships involving academic, private and government resources will be pivotal for developing adequate One Health systems that involve the appropriate socio-cultural and ethical considerations, covering issues such as the vulnerabilities of population subgroups, the interests of different stakeholders, and ethical concerns relating to animals and the environment. Developing these frameworks should include:

- The use of common integrative models for the design of studies compatible with One Health

- Harmonisation of protocols, data collection and the development of best practices

- Creating and maintaining databases to collect and store One Health data from humans, animals and the environment.

Switching from disciplinary research to One Health involves a major institutional and cultural change. To make the change, it will be essential to organise One Health practitioner networks, and to involve policymakers, communities, and major European and international organisations. Guidance will be essential here.

5.3 Develop integrated models and Key Performance Indicators to assess effectiveness of One Health implementation

The successful implementation of One Health will depend on monitoring and evaluating the initiatives involved, with a clear demonstration of the benefits they bring. This requires the development of appropriate indicators (SAPEA 2024, p.63-77, 2024).

A core set of indicators for One Health in Europe should therefore be developed, with harmonised indicators that facilitate regular assessments and proper adaptation.

Qualitative indicators for implementation should include evidence of One Health leadership and coordination bodies, documentation of relevant national plans including, for example, national integrated surveillance-response systems, the roles and responsibilities in coordinated One Health interventions, and relevant lines of communication, which should be both bottom-up and top-down.

One Health assessments should also be guided by quantitative indicators based on statistical/mathematical assessments and economic analyses, including cost-effectiveness. As noted in Chapter Four above, the Evidence Review Report provides several good examples that could serve as inspiration, from substantial welfare gains resulting from vaccination campaigns in dogs in African countries (Table 4, SAPEA 2024, Bucher et al. 2023) to reduced costs and improved surveillance resulting from the integration of laboratory capacities for human and animal diseases (The World Bank, 2012).

Evaluation systems already shown to have improved One Health implementation include the International Health Regulations Monitoring and Evaluation Framework, and the FAO multisectoral evaluation tools for epidemiology and surveillance (De la Rocque et al (2019), De la Rocque et al. (2023)).

Data for guidelines, indicators, assessment tools, and surveillance systems should come predominantly from reliable official sources, such as established national surveillance and early warning systems that integrate One Health intelligence, although sources for data that are difficult to obtain in a systematic manner should not be ignored. In addition to standard typical health indicators, others based on environmental, ecological, climatic, population/demographic and behavioural factors should also be researched and considered.

5.4 Support research in nexus and cross-cutting areas

Although evidence about the benefits of a One Health approach continues to grow, substantial knowledge gaps remain. Further research in the areas proposed below could help further understanding, and support governance and policy implementation. The aim is not to provide a complete agenda or an exhaustive list at this stage, but rather to initiate an iterative process of evaluation and identification of new priorities.

Research gaps exist in the following areas:

- Research on One Health Policy and Governance: Research is needed to develop innovative regulatory frameworks to underpin One Health initiatives and ensure coordinated responses to health threats. This should include economic evaluations of One Health interventions and their cost-effectiveness, and cost-benefit modelling exercises that take stock of broader outcomes and can therefore inform subsequent policy decisions. Research is needed to deepen understanding of the relationships between mental health, social conditions, and physical health. Barriers preventing access to health resources and services across different populations and sectors need to be uncovered, leading to greater accountability in decision-making, taking full account of equity and justice concerns.

- Surveillance and Data Sharing: Integrated surveillance systems need to be developed and implemented to detect and respond to health threats across species and environments. This includes research on standardising data collection, sharing, and analysis across different health domains, taking due account of ethical and privacy concerns to enable intersectoral comparability.

- Behavioural Drivers: Research is needed to understand the behavioural drivers of practices that affect One Health, such as wildlife trade, farming practices, and personal health behaviours such as vaccination acceptance, including investigations into cultural factors that may impede the acceptance and implementation of One Health initiatives. This would be most effective at local level with a view to stimulating community engagement strategies to promote One Health practices at these levels.

- Technological Innovations: New diagnostic tools should be developed and deployed in diverse settings to detect health threats in humans, animals and plants. This also includes regulatory levels, so that they can be deployed to appropriate policy development and monitoring. Remote sensing and technologies to monitor environmental changes that impact health are key elements here, as are leveraging big data and artificial intelligence to integrate and analyse complex health data from multiple sources, with a view to developing One Health models for these purposes.

- Disease ecology: The scientific community still needs to better understand how pathogens emerge and how transmission cycles are amplified between different species (including humans) for different infections and under specific ecological and climate conditions. Land-use changes and changes in human behaviours are key driving forces of the emergence of zoonotic diseases. Research to better model and predict the dynamics of socio-ecological systems leading to these emergences is needed to improve the timely adoption of preventive measures.

- Specific knowledge needs for policy implementation: Regulators and organisations implementing policy have specific knowledge needs, e.g. in 'Regulatory science' related to the quality, safety and efficacy assessment of medicinal products, or the behaviour of chemical and pesticides in the environment. It encompasses basic and applied biomedical and social sciences and contributes to the regulatory decision making and the development of standards and tools.

Other areas where more research is needed include biodiversity, climate change impacts on health, water management, animal welfare, ethics, and prevention schemes.

Projects that focus on and document co-benefits and trade-offs between different health outcomes and different One Health domains are also needed (including, for example, how project outcomes in AMR will affect resilience, mental health, and physical health of animals and humans). Due consideration should be given to potential conflicts of interest that are likely to arise and to the compromises that will be needed to harness available information for better decision making in the context of One Health. Social and behavioural science and research will play a vital role in investigating the feasibility and impact of specific measures and policies among populations resistant to change, and among populations where context variables or social conditions may preclude the implementation of such measures.

Recommendation 6: Improve prevention, surveillance and risk assessment related to One Health

6.1 Integrate existing infrastructures for surveillance

Existing public health surveillance systems for humans and animals focusing on the medical context should be expanded, and integrated into sustainable infrastructures that also have the capacity to monitor drivers of disease emergence, i.e. meteorological and environmental data systems. These systems should be capable of delivering information swiftly, when near real-time information is essential. Links between the systems currently in place should be improved, to deliver an integrated surveillance system that meets the needs of the sectors concerned.

Health risk analyses could then be carried out using methodologies adapted to One Health, i.e. combining surveillance systems for human and animal health indicators, with surveillance for insects, environmental parameters, remote sensing and geographical information systems, risk mapping, and mathematical/statistical modelling.

In OHHLEP 2023 a six-step approach for the development of a One Health surveillance system in described. The first step proposed is for all stakeholders to agree on the scope of the One Health surveillance. AT EU level the five relevant agencies (ECDC, EFSA, EEA, ECHA and EMA, respectively responsible for responsible for the areas of health, food safety, the environment, chemicals and medicines) have developed a joint framework for action[78]. They aim to support the development of integrated surveillance and early warning systems by facilitating and promoting greater availability, accessibility and interoperability of data, improving the quality of information for risk assessment and working towards aligning surveillance and early warning systems in Europe with the One Health approach. They should work together with the earth observation programme Copernicus, which provides information services that draw from satellite Earth Observation and in-situ (non-space) data, and has recently created a health hub with environmental data and products pertinent to Health, including data related to physical health, mental health and well-being[79].

The next steps proposed by OHHLEP are the definition of data collection components, the design of an integral system (including IT) that is flexible enough to respond to abrupt changes, to define the governance for the

[78] cross-agency-one-health.pdf
[79] Copernicus Health Hub

surveillance systems, to develop protocols, and to produce a roadmap for the implementation of a One Health surveillance system.

It will be essential to make use of new digital technologies and integrate them into surveillance and risk assessment techniques. Syndromic surveillance information using unstructured data from the internet can also be used for early detection of emerging health threats and spill overs, and this information can then be combined with structured data (e.g. surveillance) to improve impact and health risk assessments.

ANNEX 1 – METHODOLOGY

The Group of Chief Scientific Advisors (GCSA) provides independent scientific advice to the to the European Commission (EC) to inform policy making. The advisors work closely with the Scientific Advice for Policy by European Academies (SAPEA) consortium, which collects expertise in natural, biomedical, and social sciences, humanities, and engineering from a network of more than 100 academies and societies across Europe. The GCSA is supported by an administrative/scientific group in the EC's Research and Innovation Directorate General (DG RTD). GCSA, the DG RTD group and SAPEA constitute collectively the Scientific Advice Mechanism (SAM).

In this framework, the GSCDA has been asked to provide a Scientific Opinion on 'Cross sectoral evidence-based governance for One Health in the EU'.

Specifically, the question was on 'how should One Health be defined in the EU context and what are the synergies with and demarcations to other approaches such as sustainability, One Planet, Health Planet, and which EU policies could significantly benefit from the implementation of a One Health approach'. Moreover, it was asked to identify and specify ways of building capacities for One Health implementation in the EU. Finally, capacities and structures should be monitored, and effectiveness assessment should be performed based on proper indicators. The background to this request and the above-mentioned specific question to be addressed by the GSCA is presented in the 'Scoping Paper' (Annex 2). The recommendations presented in this Opinion build upon the Evidence Review Report (ERR) carried out by SAPEA (SAPEA 2024), additional literature, and expert and stakeholder consultation (Annex 3).

The scoping of the question was based almost entirely on peer-reviewed literature and occasionally grey literature such as reports of international organisations, and scientific experts. Based on this a Scoping Paper (Annex 2) was prepared. The Scoping Paper was the result of consultation with Directorates-General responsible for climate policies. The request originated

from the DG SANTE. The scientific advisors Eva Zažímalová, Nicole Grobert, and Naomi Ellemers have worked on the scientific opinion on behalf of the GCSA.

The work of the scientific advisors was supported by SAPEA, which provided the scientific evidence in a state-of-the-art report underpinning the scientific opinion. SAPEA established working groups of experts to write the Evidence Review Report. The groups addressed different pillars of the topic. The working groups carried out the work on the definition of One Health under consideration of the EU context and the EU policies benefiting from a One Health approach. They also addressed leverage points for building capacities planning and implementing One Health policies also providing exemplary case studies. Criteria and indicators to assess effectiveness were explored and suggested. The report concluded with evidence-based options for policy, and it also touched upon some research gaps. The evidence was discussed in meetings of academic experts and policy experts and practitioners (Annex 3). SAPEA also organised an expert workshop with independent scientific experts.

The SAM Secretariat helped the CSGA in organising a discussion with policy experts of the EC on the scientific evidence and this emerged from the Evidence Review Report and the associated policy relevance and an expert 'sounding board meeting' on the draft scientific opinion.

A stakeholder meeting was organised by the SAM administrative/scientific group. In this meeting the SAPEA Working Groups members and the Scientific Advisor presented the output of the SAPEA Evidence Review Report and the specific topics addressed in the scientific opinion.

Therefore, the present scientific opinion was informed by the:

- Scoping paper: 'Cross sectoral evidence-based governance for One Health in the EU', (SAM 2023).

- Evidence Review Report of the scientific literature on Cross sectoral evidence-based governance for One Health in the EU carried out by SAPEA 2024
- SAPEA Expert Scoping Workshop May 2024
- Sounding board meeting September 2024
- Policy Makers meeting October 2024
- Stakeholders meeting November 2024.

Meeting reports are published online.

ANNEX 2 – PREVIOUS OPINIONS

Historically, the One Health approach aimed to improve public human health by understanding, monitoring and improving animal health, especially in the context of zoonotic diseases. More recently, the approach has been extended to also include plant health and the environment more generally.

The recognition that human, animal, and plant health are strongly interlinked and cannot be separated from the environment leads to a better understanding of factors determining health and interactions between these factors. However, it also makes a One Health approach more complex to devise, implement and govern, and to measure the benefits such an approach has.

The European Commission's Scientific Advice Mechanism (SAM) has previously given advice on many issues that relate directly or indirectly to human, animal, and/or plant health and the environment more generally. SAM has also discussed and given recommendations for aspects that are relevant for the governance of One Health at EU level. This chapter provides a summary of relevant Scientific Opinions.

Discussions relevant to One Health

One obvious application for One Health is in improving pandemic preparedness. The 2020 Scientific Opinion "Improving pandemics preparedness and management" states that the "majority of human infectious diseases […] is zoonotic" and that "the emergence of [transmissions of such diseases to humans] is typically driven by human activities, including deforestation and other changes to land use (e.g. for construction or intensive crop and livestock farming), wildlife exploitation, as well as increased meat consumption, urbanisation and mobility with globalised trade, travel and migration" [PANDEMIC 2020]. It also highlights the link between climate change (which affects all of life on earth) and the likely increase of "outbreaks of infectious diseases, in particular zoonoses and vector-borne diseases" [ibid.].

In 2020, the SAM also delivered advice on "Adaptation to health effects of climate change in Europe" [CLIMATE 2020]. It recalls that "the temperature increase in Europe has been faster than the global average" (indeed, Europe is the fastest warming continent/is warming twice as fast as the global

average [European State of Climate Report 2024]) and that, beyond the rise in temperature, "climate change can also lead to unexpected high-impact events, as a consequence of the complexity and non-linearity of many processes involved" [CLIMATE 2020]. Such consequences could be the re-emergence of diseases such as anthrax, due to the thawing of the permafrost, and the increased incidence of food-, water- and vector-borne diseases — not least "through changes in ecosystems, which also lead to changes in interactions between animals and humans" [CLIMATE 2020]. But the impacts on human health were already concrete enough in 2020 to have warranted the statement that climate change "is undermining the 'right to health' cited in the Paris Agreement" and will do so increasingly [CLIMATE 2020]. Rising global temperatures, for example, will likely lead to a more than ten-fold increase in annual human fatalities from extreme heat [CLIMATE 2020], with likely higher numbers for livestock and wildlife.

The [health effects of climate change] Opinion discusses this more in detail and explicitly refers to the relevance of One Health: "Human health is further adversely affected in indirect ways through ecosystem effects of climate change. These include loss of biodiversity, air pollution, ocean acidification, or changes in wildlife behaviour due to habitat changes or degradation. These changes shift the range and activity patterns of disease vectors including ticks, mosquitoes, or bats. Thus, the health of humans, animals, plants and ecosystems is connected and is often referred to as 'One Health'." [CLIMATE 2020].

The [health effects of climate change] Opinion further argues that "direct climate impacts such as heat waves and floods also have diverse socioeconomic effects, e.g., productivity loss, reduced access to other basic services, and food insecurity – which in turn exacerbate the negative effects on health" [CLIMATE 2020], which is also analysed in the Opinions on the COVID-19 pandemic and on crisis management [PANDEMIC 2020, CRISIS 2022].

The 2020 Opinion on pandemics discussed another threat that has long been recognised by One Health practitioners: the rise of antimicrobial resistance (AMR). Due to the mis- and overuse of antibiotics "there is an increasing emergence of antimicrobial-resistant (AMR) bacterial strains" [PANDEMIC 2020].

However, the Opinion also expands on the threats posed by pandemics that go beyond infection: "epidemics and pandemics have devastating effects on

societal and individual wellbeing more largely. They strongly impact economies, livelihoods and psychosocial wellbeing across entire communities" and lead, for example, to rising unemployment and poverty rates [PANDEMIC 2020]. It goes even further to describe the link between socio-economic disadvantage and increased health vulnerability: "socio-economically disadvantaged groups are disproportionately affected by infectious diseases" [ibid.].

Beyond infectious diseases, the food system is also relevant for One Health in many direct and indirect ways. Firstly, "food production […] consumes large amounts of natural resources such as water and energy, results in the loss of biodiversity, and contributes to climate change" [SFS 2020; see also SFC 2023], including using plant protection products [PPP 2018]. Secondly, it is directly relevant for non-communicable diseases, such as malnutrition, obesity, and diabetes, which are "often related to unhealthy food offering and poor dietary choices" and "have become a major public health issue in the EU" [SFS 2020; see also SFC 2023].

Furthermore, "climate change will affect production, processing, distribution and storage of food," [SFS 2020] as will biodiversity loss. One of the main reasons for high greenhouse gas emissions related to agriculture – which drive climate change – is livestock production [SFS 2020, SFC 2023]. Here, the food system also links to other One Health issues, such as AMR – which is related to disproportionate antibiotics use in traditional animal agriculture – as well as zoonoses, air and water pollution, and animal health – which is often negatively impacted by traditional husbandry and transport practices [SFS 2020, SFC 2023].

Recommendations relevant to One Health

Both the 2020 Opinion on Sustainable Food Systems and the 2023 Opinion on Sustainable Food Consumption argue strongly for an integrated approach to a sustainable food system, based on a common "set of balanced environmental, social and economic sustainability objectives to shift the culture of food policy making" [SFS 2020; see also SFC 2023] and lead to the "adoption of practices that conserve biodiversity and provide animal welfare benefits" [SFC 2023]. "A crucial expected benefit of a truly integrated approach is greater assurance that initiatives in one policy area do not contradict policies […] in another area. Indeed, all key future food-relevant policies would be developed together based on a single strategy, coming from the same starting point in support of the central sustainability

objective" [SFS 2020]. Similarly, the 2023 Opinion argued: "All possible synergies between policy interventions should be explored, maximising opportunities and benefits while managing unavoidable trade-offs. Existing policies therefore need to be carefully evaluated in order to assess how they serve and support (or contradict) the goal" [SFC 2023]. A related recommendation was included also in the Opinion on plant protection products [PPP 2018].

The Scientific Opinion on crisis management similarly recalls that "the speed of change and the complexity of crises are increasing, and consequent processes are more often irreversible" and that the European Green Deal [see chapter on policy background] "is endangered by the cascade of crises that we are living through now" [CRISIS 2022]. It then recommends that "the European Commission develops a roadmap and create synergies and interlinkages between existing and future legislation and instruments to better deal with the increasingly systemic nature of large-scale crises, in a structural manner" and that it should develop "adaptive instruments to deal with cascading failures and transboundary and cross-sectoral impacts, to overcome the tendency of adding new specific tools at each crisis" [CRISIS 2022].

This is mirrored in the need for a coherent and integrated approach to One Health.

The 2020 Opinion on pandemics recommends increasing efforts to investigate emerging infectious diseases and how to reduce their risks, as well as the effects of pandemics and mitigation measures. For this, it recommends greater multi- and interdisciplinary scientific efforts and increased coordination between EU Member States and at global level. Beyond this, the Opinion also urged EU Member States to strengthen public health infrastructure and ensure healthcare for all. Crucially, it also urged for finding solidarity-based and sustainable ways of living that address "the links between health crises and environmental degradation" and "update existing policies in related fields, such as environmental protection, food, transport and urban planning" [PANDEMIC 2020].

While the Opinion on pandemics recalls that "adequate preparedness for pandemics is a national obligation under the International Health Regulations (2005) and the EU Decision on serious cross-border threats to health (1082/2013/EU)" [PANDEMIC 2020], it is clear that these can be tackled more effectively with greater international collaboration and data sharing

(see also the European Commission's communication on effective, accessible and resilient health systems (COM/2014/0215)). The 2022 follow-up Scientific Opinion on crisis management recommends providing "interoperable, high-quality data" and developing "interoperable monitoring, detection, information, and alert systems to allow the use and reuse of data and information for multiple purposes, including risk assessments, early warning, early action, enhanced situational awareness, response, and recovery" [CRISIS 2022]. Monitoring should be systematic, and data "with relevance to both health and the environment" should be gathered comprehensively [PPP 2018]. It may also be relevant to integrate socio-economic data into One Health planning to be able to consider the effects on sub-groups of the population [CLIMATE 2020].

Related to this, the 2018 Opinion on plant protection products criticises that the EU's "precautionary principle"[1] is often too vague and should be complemented by "realistic, practical, unambiguous and quantifiable protection goals […] [that] cover human and animal health, and the environment, including wildlife" [PPP 2018].

Further, the need to strengthen European governance for strategic (crisis) management, expressed in the Scientific Opinion on "Strategic crisis management in the EU" from 2022, is reiterated in the scoping questions for the present Opinion [reference to Scoping Paper annex]. On this, the Opinion on crisis management recommends creating "more cohesive, supportive, and complementary mechanisms for preparedness, response, and recovery, developing stronger synergies across European institutions and between European Institutions and Member States" [CRISIS 2022]. This governance should be based on "adaptive, flexible management that is context-sensitive," which would reinforce "mutual trust between communities and decision-makers and between Member States and EU institutions and bodies" [ibid.]. In the One Health context, this is obviously relevant during health crises, such as the COVID-10 pandemic, but also when it comes to preventive and mitigating measures, such as reducing the consumption of animal-derived foods [see also FOOD SYSTEM 2020, FOOD CONSUMPTION 2023].

Arguments in favour of EU climate mitigation efforts are easily adapted to justify a One Health approach: "Since climate change effects in other regions have consequences for Europe (EASAC 2019) and the EU also has global commitments, a broader perspective on an EU climate-resilient health system also requires aligning relevant policies with global goals for

sustainable development and for disaster risk reduction goals. The EU's global role, particularly through its development aid policies, should include funding and support for countries in the global south in improving their climate change adaptation plans. That aid is a part of addressing global climate risks and impacts and is therefore in the EU's direct interest as well" [CLIMATE 2020].

The Opinion on crisis management also recommends stress-testing critical infrastructure and the provision of essential services [CRISIS 2022]; in the One Health context, this could mean stress-testing healthcare infrastructure (e.g., for extreme weather events, pandemics), but also testing resistance and resilience against the effects of climate change more broadly. This includes developing measures to protecting essential workers, though the notion of who counts as essential should be dynamic and adapted to the crisis at hand (e.g., healthcare workers, veterinarians, first responders) [CRISIS 2022; see also CLIMATE 2020].

Interestingly, and highly relevant for One Health, the Opinion also recalls that "facts and values cannot be disentangled in risk and crisis management" and that "defining accepted risk is not only a technical exercise based on probabilities but implies a judgement on the severity of potential impacts. The latter varies among individuals and cultures" [CRISIS 2022]. This is relevant for advocating for and implementing a One Health approach both globally and within the EU.

The Opinion also stresses that close collaboration with society is essential to manage crises effectively and warns that "in times of crisis, and especially in long-lasting crises, trust can deteriorate rapidly" [CRISIS 2022]. For this, it recommends to "communicate reasons and values behind decisions, possible dissenting viewpoints, and uncertainties clearly, concisely, and consistently" and provides further details on how to do this [CRISIS 2022]. This is stated more generally in the 2019 Opinion on scientific advice: "Complex policy issues addressed by scientific advice may be socially contested – which means that there are widely different opinions in society about the desired goals and courses of action. Contestation is typically due to different values, beliefs and attitudes […] Whenever scientific advice is called upon to inform contested or polarising issues, members or representatives of the public should be involved from early stages" [MASOS 2019].

ANNEX 3 – SCOPING PAPER

Scientific Advice Mechanism

European Commission's Group of Chief Scientific Advisors

Scoping paper:

«Cross sectoral evidence based governance for one health in the eu »

29 September 2023

« Cross sectoral evidence based governance for One Health in the EU »

The EU is facing many intrinsically systemic and cross-sectoral challenges, including the management of complex crises, the energy transition, the pandemic, the development of a sustainable food system and the operationalisation of One Health. These challenges often require a knowledge paradigm shift towards truly transdisciplinary approaches and rapid application in the real world with little room to experiment in a safe space ahead of time. A systemic approach effectively means that multiple policy departments must work together in a coherent manner to ensure that i) relevant expertise and competences are integrated and that ii) synergies, possible trade-offs, and unintended consequences are taken into account from the earliest stages. Whilst recommendations towards such systemic approaches and cross-sectoral governance at the EU level have already been provided by the Group of Chief Scientific Advisors (GCSA) in the Scientific Opinions "*Towards a Sustainable Food System*"[80] and "*Strategic Crisis Management in the EU*"[81], there is still a need for more general in-depth analysis of scientific evidence, knowledge, and practical examples of approaches to manage policymaking for other complex fields in a systemic manner. One Health is a prime candidate for such a complex challenge.

Originally, the concept of "One Health" has developed from the recognition of the strong links and interdependencies of human and animal health (Schwabe, et al., 1964[82]). During the Covid-19 pandemic, the One Health approach received a strong boost. The pandemic has shown very clearly how interlinked the prevention of and response to pandemics, tackling antimicrobial resistance, equitable access to high-quality health care and protection of the environment are. More recently, aspects of ecosystems health have also been included, whereby the influence of changing landscapes, deteriorating environmental conditions and climate change on the emergence and resurgence of both infectious and non-communicable diseases are also considered (Zinsstag et al 2012; Hulme 2020). Furthermore, both human physical and mental health have been correlated with healthy ecosystems

[80] https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/scientific-support-eu-policies/group-chief-scientific-advisors/towards-sustainable-food-consumption_en
[81] https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/scientific-support-eu-policies/group-chief-scientific-advisors/strategic-crisis-management-eu_en
[82] Schwabe was pioneering the idea in the Sixties even though he actually used the term "One medicine" later in the Eighties.

(Jimenez et al., 2021). Understanding the complexity of ecosystems is becoming increasingly important in the face of accelerated global environmental change and biodiversity degradation and requires indeed knowledge and actions from many disciplines. In the context of food security and sustainability (Garcia et al 2020), One Health permits to better manage transboundary diseases that may potentially impact on food production and availability (as in the case of preventing the introduction and spread of plant pests in the Union). The connection between urban areas and health has been recognised and acted upon since the early 19th century (Coburn 2015) and has been more recently taken up again by an UN-HABITAT and WHO (2020) report on One Health initiatives in cities.

'One Health', similar to other concepts developed to synthesise new approaches for solving complex problems such as 'sustainability' or 'resilience', is often perceived as new 'buzzword' that lacks the necessary theoretical and operational foundation and that instead duplicates existing ones. To counteract this risk and the perception of One Health as being too broad, *i.e.*, covering too many aspects and topics ranging from human and animal health to ecosystems and landscape changes to urban infrastructures (Ramaswami 2020) and social determinants of health, making it difficult to operate, it needs to be understood as the nexus between those different but tightly interconnected fields. Such nexus is framed in the One Health definition of the Quadripartite that constitutes the reference for ongoing applications of One Health in different countries. According to the Quadripartite Joint Action Plan One Health is defined as *"an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent"*[83].

As stated in the Budapest Declaration, adopted on 6 July 2023 by the ministers and representatives of the WHO-Europe Region responsible for health and the environment, this nexus needs to be operationalised in dual direction: making health systems more environmentally friendly and climate neutral and on the

[83] The term environment is intended as the surroundings where different kinds of organisms live, whilst an ecosystem is a place where different kinds of biotic creatures live, eat, and stay for their daily living, acting as a transversal layer where interactions between environmental abiotic factors and living organisms occur.

other hand better integrate environmental and health policies. (Seventh Ministerial Conference on Environment and Health 2023).

Some lessons can already be learned from applications of One Health. Firstly, the goals for which the One Health approach is promoted must be clearly outlined at beginning of the process. A non-exhaustive list of examples of such objectives are:

- tackling antimicrobial resistance considered as "the silent pandemic"[84], including the use of antibiotics and fungicides in agriculture (Miller et al 2022),
- managing crises with health implications, whether or not caused by a medical trigger (Dacso et al 2022),
- pandemic surveillance and early warning, enforcing cross-surveillance of diseases in animals and humans bringing together veterinarians and medical doctors investigating similarities and differences between illnesses in humans and animals (Angelou et al 2021),
- monitoring food safety to minimise the risk of foodborne pathogens and of toxic residues,
- promoting well-being across different age and social groups in communities both in urban and rural environments, taking into consideration the differential risk of exposure to work related diseases (EU-OSHA 2020),
- promoting healthy ecosystems that provide services supporting also human well-being,
- ensuring healthy food production as well as quality and availability of freshwater by monitoring of the environment, in particular the quality of soils,
- surveillance of contaminants that can impact the diversity of environmental microbiomes (soil, water, food, etc.) as well as agro-chemicals (e.g. plant protection products) that can impact on human and environmental health, including non-targeted species such as pollinators.

For One Health to achieve its goals the concurrent contribution of different sectors with different competences and expertise is indispensable. Cross sectoral governance arrangements are required by the systemic integration of

[84] Council conclusions of 22 June 2012 on the impact of antimicrobial resistance in the human health sector and in the veterinary sector — a 'One Health' perspective (2012/C 211/02).

disciplines and fields to be interconnected by the One Health approach (see Deere-Birkbeck, 2009). Integrated arrangements beyond traditional ones are needed to overcome the barriers between separated offices and departments pursuing well defined agendas and with clearly delimited objectives (National Academies of Science 2023). Cross sectoral governance, though, entails a number of challenges. The most obvious relate to clear mandates, resources, and financing.

Equally important, though, are challenges related to data management and knowledge. Solutions for improving One Health surveillance focus mainly on enhancing the integration and sharing of surveillance data, added to IT infrastructures and analytical capabilities (Ribeiro et al 2019). The evaluations that have been carried out insofar on One Health initiatives highlight how sharing and co-producing knowledge across sectors is particularly critical (Pelican et al 2019). Sharing and co-producing knowledge requires time, commitment, trust, and open mindset, being able and disposed to work outside well-defined boundaries. An additional burden derives from the difficulty to carry out transdisciplinary research and studies for a number of reasons that include the lack of criteria to evaluate what constitutes good quality transdisciplinary research and its outputs (Belcher et al 2016). Specific training to conduct such type of research seems necessary, as pioneering examples of educational programs in One Health demonstrate[85].

Challenges of cross sectoral governance at the EU level have already been addressed and solutions highlighted by the GCSA in the Opinion on "Strategic Crisis Management in the EU", in which they have pinpointed the need for a truly networked setting with a core-periphery configuration. There is still the need to explore to what extent such governance networked approach can function also for other complex problems requiring cross sectoral and cross stakeholder collaboration; and how governance needs to be adapted to the specificities of the One Health approach.

The examples and case studies that have been analysed until now refer to an international context including but not limited to the EU (Hitziger et al 2021). Others refer to national cases, such as the One Health approach to anti-microbial resistance developed in Denmark (Queenan et al 2016). Useful evaluations of the tools to implement One Health that have been applied

[85] See for example the educational and training modules developed within he EJP on One Health: https://onehealthejp.eu/community/education-and-training

insofar are also available. Here the issue is not limited to the identification of the best tools, but also on eliciting criteria that help discriminate the tools that are most effective to achieve a specific goal and those that are more suitable in a specific geographic, political, and cultural context. The applicability of the identified tools to the EU level needs to be analysed.

Question asked to the GCSA

The GCSA are asked to provide scientific advice on the following overarching question:

Considering a complex policy area, i.e. One Health, what forms of management and cross-sectoral collaborations are best suited to ensure that synergies, possible trade-offs, and unintended consequences are taken into account?

In order to apply this overarching question to the example of One Health, a number of sub questions need to be addressed:

- How should One Health be defined in the EU context and what are the synergies with and demarcations to other approaches such as 'sustainability', 'One Planet' and 'Healthy Planet'?
- Which tools and leverage points for building capacities, planning and implementing One Health are most suitable for the EU level to maximise synergies, consistency and coherence of interventions and avoid duplication of efforts?
- What are the criteria and the indicators that are most useful to assess the effectiveness of the tools and for monitoring the implementation of complex policies such as One Health?

The advice should respect the EU competence and remit, and the principle of subsidiarity. The focus should be on the EU policy level but take into consideration that One Health policies require cross level collaboration. The advice should provide a clear direction for the formation of One Health policy at the European Commission level, with the aim to achieve its operationalisation and adaptation to MS across Europe. This means to develop recommendations for EU policy taking into account the multiple scales required for One Health implementation, from the local to the national and in the coordination at the international levels. For this the experience gained by EFSA, ECDC, EEA, EMA and ECHA in developing multiagency

collaboration[86],report of the EC Junior Professionals Project 'Operationalisation of the One Health approach across the EC' ("internal to the Commission, unpublished") and the research conducted by the JRC[87] on One Health could be leveraged upon.'

The scientific opinion should be handed over by Q2 2024 on a date to be established with the Commissioners for Health and Food Safety and for Innovation, Research, Culture, Education and Youth. It will rely on the work of the Science Advice to Policy by European Academies (SAPEA) consortium, which should be tasked with developing a comprehensive and cross-disciplinary evidence review for that purpose (including natural sciences, social sciences, and the humanities).

References

Angelou A., Kioutsioukis I., Stilianakis N. I. (2021), A climate-dependent spatial epidemiological model for the transmission risk of West Nile virus at local scale, One Health, 13.

Belcher et al (2016), Defining and assessing research quality in a transdisciplinary context, Research Evaluation, 25, pp. 1–17

Berthe F.C.J., Bouley T., Karesh W.B., Le Gall F.G., Machalaba C.C., Plante C.A. & Seifman R.M. (2018). One Health – Operational framework for strengthening human, animal and environmental public health systems at their interface. World Bank, Washington, D.C., USA, 152 pp. Available at: http://documents.worldbank.org/curated/en/703711517234402168/ (Last accessed June 2023).

Coburn J. (2015), Reconnecting urban planning and public health, Weber R. and crane R. (Eds) The Oxford Handbook of Urban Plannin, Oxford University Press.

Dacso M et al. (2022). Texas professionals are employing a one health approach to protect the United States against biosecurity threats, One Health, 15, 2022.

[86] https://www.efsa.europa.eu/sites/default/files/documents/news/one-health-cross-agency-task-force.pdf, see also Bronzwaer et al (2022), One Health collaboration with and among EU Agencies – Bridging research and policy, One Health 15.

[87] Health crises response (europa.eu); Healthy biodiversity (europa.eu)

Deere-Birkbeck C. et al (2009), Global Governance in the Context of Climate Change: The Challenges of Increasingly Complex Risk Parameters, in International Affairs, Vol. 85, No. 6, Tackling Resource Challenges in the 21st Century: Avoiding Worst Case Scenarios, pp. 1173-1194.

EU-OSHA (2020), Biological agents and prevention of work-related diseases: a review. European Risk Observatory, Luxembourg: Publications Office of the European Union.

Garcia, S. N., Osburn, B. I., & Jay-Russell, M. T. (2020). One health for food safety, food security, and sustainable food production. Frontiers in Sustainable Food Systems, 4, 1

Jimenez M.P., DeVille N.V., Elliott E.G., Schiff J.E., Wilt G.E., Hart J.E., James P. (2021) Associations between Nature Exposure and Health: A Review of the Evidence. Int J Environ Res Public Health, 18:9, pp. 4790.

Hitziger M et al (2021), System thinking and citizen participation is still missing in One Health initiatives – lessons from fifteen evaluations. Frontiers in Public Health 9:653398.

Hulme PE. (2020), One Biosecurity: a unified concept to integrate human, animal, plant, and environmental health, Emerg Top Life Sci. 4(5), pp. 539-549.

Miller S. A., Ferreira J. P., LeJeune J. T. (2022), Antimicrobial use and resistance in plant agriculture: A one health perspective, Agriculture, 12:2, 289.

National Academies of Sciences, Engineering, and Medicine, (2023), Integrating Public and Ecosystem Health Systems to Foster Resilience: A Workshop to Identify Research to Bridge the Knowledge-to-Action Gap, Proceedings of a Workshop. Washington, DC: The National Academies Press. https://doi.org/10.17226/26896.

One Health High Level Expert Panel (OHHLEP), OHHLEP Annual Report 2021.

Pelican K. et al, (2019), Synergising tools for capacity assessment and One Health operationalization, Revue Scientifique et Technique (International Office of Epizootics), May, 38(1)

Quadripartite Organizations (Food and Agriculture Organization of the United Nations (FAO), Nations Environment Programme (UNEP), World Organisation

for Animal Health (WOAH), and the World Health Organization (WHO)) (2022), One health joint plan of action (2022–2026): working together for the health of humans, animals, plants and the environment, October 14 2022.

Queenan K., Häsler B., Rushton J. (2016), A One Health approach to antimicrobial resistance surveillance: is there a business case for it?, International Journal of Antimicrobial Agents, 48:4, pp. 422-427.

Ramaswami A., Unpacking the Urban Infrastructure Nexus with Environment, Health, Livability, Well-Being, and Equity, One Earth, CellPress, 2, 2020.

Ribeiro C.D., van de Burgwal L.H., Regeer B.J. (2019) Overcoming challenges for designing and implementing the One Health approach: A systematic review of the literature, One Health, Jun 1:7.

Seventh Ministerial Conference on Environment and Health, Declaration of the Seventh Ministerial Conference on Environment and Health, Budapest, 5-7 July 2023, EURO/Budapest2023/6, available at: https://www.who.int/europe/event/seventh-ministerial-conference-on-environment-and-health (accessed July 14 2023).

Schwabe C. (1964), Veterinary medicine and human health, The William and Wilkins Company, Baltimore.

UN-HABITAT and World Health Organization, Integrating health in urban and territorial planning: a sourcebook. Geneva, 2020. Licence: CC BY-NC-SA 3.0 IGO.

Zinsstag J., Mackenzie J.S., Jeggo M., Heymann D.L., Patz J.A., Daszak P. (2012) Mainstreaming one health, Ecohealth, June, 9:2, pp. 107-110

ANNEX 4 – LIST OF EXPERTS AND STAKEHOLDER REPRESENTATIVES CONSULTED

Sounding Board Meeting Participants

Name	Current Institution
RIZZOLI Annapaola	R& I Centre, Fondazione Edmund Mach, Trento, IT
TIMMERMANS Danielle	Dept. Public and Occupational Health, VUB Amsterdam NL
OTTERSEN Ole Petter	University of Oslo, NO University of Oslo, NO
LAPINSKI Maria K	Michigan State University, MI, USA
CAPPS Benjamin	Dalhousie University (Nova Scotia), CA
PFLEGER Sharon	The Robert Gordon University, Aberdeen, UK
CALLEGARI Arnaud	French Agency for Food, Environmental & Occupational Health & Safety, FR
DAR Osman	Chatham House/London School of Hygiene and Tropical Medicine/Public Health England, UK
CHIOTAN Cristina	EIT Health, Brussels

Stakeholder Meeting Participants

Name	Current Institution
Olcay Bingol	European Coordination Via Campesina (ECVC)
Renaud Vatrinet	Pasteur Network
Paul De Raeve	EFN - European Federation of Nurses Associations
Julian Blanc	UNEP - United Nations Environment Programme
Barbara Brusca	AESGP - Association of the European Self-Care Industry
Edward De Beukelaeer	EUROCAM
Ghada Zoubiane	ICARS - International Centre for AMR Solutions
Ricard Celorio	FoodDrinkEurope
Fanny Courivaud	EDA - European Dairy Association
Alice Diana	Federation of Veterinarians of Europe (FVE)
Luis Rhodes Baiao	AESGP - Association of the European Self-Care Industry
Siska Pottie	IMACE European Margarine Association

Jeremy Belzunces	IBMA - International Biocontrol Manufacturers Association
DiogoTeixeira Pereira	Standing Committee of European Doctors (CPME)
Marleen Kestens	EHN, European Heart Network
Ana Granados Chapatte	EFFAB - European Forum of Farm Animal Breeders
Sascha Marschang	HOPE - European Hospital and Healthcare Federation
Pablo Sagredo Martín	UNEP, United Nations Environment Programme
Sarah Abitbol	EUPHA European Public Health Association

Policy officers consulted

EC Service	**Name of the PO**
DG SANTE	ROGGE Alexander
	AMSLER Sandrine
	VALENCIANO Marta
	WEILAND Sigrid

	TUIJTELAARS Alexandra
DG ENV	KOROSEC Lorena
	D'EUGENIO Joachim
DG JRC	BATOROVA Michaela
	COECKE Sandra
	CUBRIA RADIO Marta
DG GROW	ROEBBEN Gert
	CHASSAGNE Olivier
	FILIPESCU Daniela
DG HERA	ASHOUR Dina
	PERRIN Jean-Baptiste
	ALHO Margarida
	GERN Olivia Luise
DG RTD	MOLINA VILLANUEVA Jorge David
	FRITZ Marco

	VAN DE GOOR Gianpietro
	GOYENS Petra
DG CLIMA	LOEFFLER Peter
DG AGRI	LOPEZ BLANCO Ana Patricia
	CAVITTE Jean-Charles
	ABBADESSA Valerio
EFSA	BRONZWAER Stephan
	DAS NEVES Carlos
ECDC	HEUER Ole
EEA	MARNANE Ian
	VUAILLE Jeanne
ECHA	KORJUS Pia
	FABJAN Evelin

ANNEX 5 – POLICY LANDSCAPE

A INTERNATION LEVEL

One Health High Level Expert Panel (OHHLEP)

The definition of One Health has been put forward by an expert advisory group, the **One Health High Level Expert Panel (OHHLEP)[88],** which has been formed under the auspices of the **Food and Agriculture Organisation of the United Nations (FAO), the World Organisation for Animal Health (OIE), the United Nations Environment Programme (UNEP) and the World Health Organisation (WHO),** known as the Quadripartite and who have collectively endorsed this definition.

It inherently recognises a holistic view that conditions for the health of a living being cannot be properly analysed and understood without considering the health and well-being of other entities which it interacts. This takes stock of all complex interactions and interdependencies, including plants, microbes, soil, food safety, waterways, the atmosphere, manufactured materials and chemicals, and the climate, although this is by no means an exhaustive list.

This finds practical expression in **the One Health Joint Plan of Action (2022–2026) (OH JPA) of the Quadripartite[89]** and the **Implementation Guide of the One Health JPA** of the Quadripartite[90] provide countries with practical guidance on how to implement the One Health approach through the adoption and adaptation of the One Health JPA (endorsed in December 2023).

Technical Advisory Group (TAG) for One Health

In addition, a **Technical Advisory Group (TAG)** for **One Health[91]** has been formed at the **WHO Regional Office for Europe and Central Asia (**aka **"WHO Europe")** on the matter. It reviews progress, evaluates and provides guidance on how One Health is operationalised in this region of WHO. This means identifying major strategic, scientific, structural, and technical

[88] https://www.who.int/groups/one-health-high-level-expert-panel
[89] https://www.who.int/publications/i/item/9789240059139
[90] https://openknowledge.fao.org/items/d5be526e-36a6-4c90-8b7c-75ac01bc340c
[91] https://www.who.int/europe/groups/technical-advisory-group-(tag)-for-one-health/tag-for-one-health-terms-of-reference

challenges and opportunities. It also suggests priority research questions and innovative approaches to operationalise **One Health** and reviews and advises **WHO Europe** on engagement in partnerships to enhance impact at its individual Member State levels.

This operates through its **Regional One Health Coordination Mechanism (ROHCM)**[92] with a **One Health Partner Platform**[93] which brings together multiple partners and stakeholders from various sectors and backgrounds to provide strategic advice and coordinate the implementation of the **One Health** approach in Europe and Central Asia.

B European Legislative Actions relevant to One Health

An effective European **One Health** approach requires cooperation and collaboration between relevant sectors and disciplines, such as agriculture, environment, climate, human medicine, veterinary medicine, epidemiology, environmental and social sciences, governance, etc. Professionals and representatives of these sectors now work together at national, regional, and international level to prevent, identify and monitor **existing and emerging cross border threats** and reduce and stop their spread. Measures are in place **to protect the health and safety of animals** and to visualise **climate change-related health risks** to act and respond to these risks. A **One Health** approach therefore contributes to better human, animal and environmental health, as well improved food safety. Hence, to be effective, a One Health approach requires coherent and cross cutting actions across policy areas that rely or impact the health of humans, animals, plants, or ecosystems. It is therefore closely related to bioeconomy providing sustainable solutions based on biological resources.

Cross-Border Health Threats

For over two decades already, the European Union has had in place legislation to ensure a coordinated response to cross-border health threats from infectious diseases, chemical, biological, environmental, and unknown origin, either accidentally or deliberately released. This legislation has been

[92] https://rr-europe.woah.org/en/Projects/regional-one-health-coordination-mechanism/
[93] https://rr-europe.woah.org/app/uploads/2021/09/tor-joint-reg-tripartite-on-one-health-20-april-final.pdf

strengthened with a new **Regulation on Serious Cross-Border Threats to Health**[94]**.**

It creates a more robust legal framework to improve the EU's capacity in the vital areas of prevention, preparedness, surveillance, risk assessment, early warning, and response. It is the main legal act that sets the structures, processes and mechanisms at EU level to respond to threats to public health of biological, chemical, environmental or unknown origin. The EU now has:

- the possibility of declaring an **EU public health emergency** to trigger increased coordination, the deployment of ECDC support and mechanisms for joint procurement and implementation of medical countermeasures such as treatments or vaccines.
- more robust preparedness planning at EU level, and regular monitoring of Member States' preparedness capacities
- an expanded early warning and response system that is interoperable with other alert systems at EU and international levels and that will support efficient contact tracing and a new medical evacuation module
- a strengthened, integrated surveillance system at EU level, using artificial intelligence and other advanced technological means
- a strengthened **Health Security Committee**
- a new risk assessment framework for all hazards, including rapid and appropriate recommendations for response measures, involving several EU agencies: **ECDC, EFSA, ECHA, EEA, EMCDDA, Europol, EMA**

Zoonotic threats

The European Commission also supports a One Health approach when it comes to the prevention, preparedness and response to zoonoses, especially major threats such as Avian influenza, West Nile Fever, Zika, Ebola, etc.

Prevention, robust surveillance, rapid detection and swift response are vital when dealing with serious cross-border health threats such as zoonoses. Through actions under the EU4Health programme the Commission works towards developing integrated surveillance and prevention of zoonotic spillovers as another important area where the One Health approach is critical.

[94] Regulation (EU) 2022/2371 of the European Parliament and of the Council of 23 November 2022 on Serious Cross-Border Threats to Health and repealing Decision No 1082/2013/EU (Text with EEA relevance), PE/40/2022/REV/1

These come in the form of specific measures for example against BSE[95], the inspection of meat for parasites, such as *Cysticercus* and *Trichinella* as part of the legislation concerning meat hygiene[96], as well as acts designed to cut the incidence of food borne diseases such as Salmonella[97] and other monitoring processes for zoonoses and zoonotic agents[98].

One Health principles are deployed in many different policy areas of the Commission at European and international level and stretching beyond the fields of AMR and zoonoses control, like animal welfare, biodiversity, soil health, sustainable use of pesticides, climate and health, prevention, detection, and rapid response to future health emergencies. Relevant initiatives include in particular:

- As well as being a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems, the **EU Biodiversity Strategy (2030)**[99], aims to take measures against illegal wildlife trade which is considered as one of the causes behind the emergence of zoonotic diseases, as well as the protection and restoration of ecosystems,

- The **EU Zero Pollution Action Plan (COM (2021) 400 final)**[100], which aims for air, water and soil pollution to be reduced to levels no longer considered harmful to health and natural ecosystems,

- the **European Health Emergency Preparedness and Response Authority**[101] **(HERA)**, created in 2021 to prevent, detect, and rapidly respond to health emergencies, including AMR related threats and other potential crises, and

[95] Regulation (EC) No 999/2001
[96] Regulations (EC) No 853/2004, No 854/2004 and (EU) No 2015/1375
[97] Regulation (EC) 2160/2003
[98] Directive 2003/99/EC
[99] https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en
[100] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All COM(2021) 400 final, Brussels, 12.5.2021
[101] Commission Decision of 16 September 2021 establishing the Health Emergency Preparedness and Response Authority 2021/C 393 I/02

- the **Global Health Strategy (2022)**[102]**.**

Animal Health and Welfare

The EU has established comprehensive legislation[103] governing animal health, including measures to prevent and control the spread of animal diseases. This legislation emphasises the importance of a coordinated approach involving veterinary and public health authorities, as well as other stakeholders, to protect both animal and human health and that of ecosystems.

The Commission has also initiated in 2024 on-site visits to Member States exploring the controls and One Health mechanisms in place for the prevention, detection and response to zoonotic threats with pandemic potential such as avian influenza in fur animal and poultry farms.

Animal Welfare

Harmonised EU rules are in place covering a range of animal species and welfare-affecting issues. **Council Directive 98/58/EC**[104] lays down the minimum standards for the protection of all farmed animals at farm level. EU legislation also sets welfare standards for the **transport of animals**[105] and **conditions at the time of stunning and slaughter**[106]**.**

The Commission has proposed a **new Regulation**[107] to overhaul EU rules for the protection of animals in transport and new rules on the welfare and traceability of dogs and cats. This focusses on the following main objectives, which are essential for the good welfare of animals in transport:

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[102] https://op.europa.eu/en/publication-detail/-/publication/c32fc28c-80e0-11ed-9887-01aa75ed71a1

[103] The main legal instruments are the Animal Health Law, Regulation (EU) 2016/429 and Directive 2003/99/EC of the European Parliament and of the Council of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC

[104] https://eur-lex.europa.eu/eli/dir/1998/58/oj

[105] Council Regulation (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No 1255/97

[106] Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing (Text with EEA relevance)

[107] Proposal for a Regulation of the European Parliament and of the Council on the protection of animals during transport and related operations, amending Council Regulation (EC) No 1255/97 and repealing Council Regulation (EC) No 1/2005

- reduce animal welfare problems linked to long journeys and repetitive unloading and re-loading linked to several rest periods;
- ensure that animals have more space when transported;
- improve the conditions of transport of vulnerable animals;
- avoid exposing animals to extreme temperatures;
- facilitate enforcement of EU rules on the protection of animals, including trough digitalisation;
- better protect animals exported to non-EU countries.

Wildlife Trafficking

Recognising the role of wildlife trafficking in the spread of zoonotic diseases and threats to biodiversity, the EU has developed an action plan to combat illegal wildlife trade. The EU Action Plan against Wildlife Trafficking108 includes measures to strengthen enforcement, enhance international cooperation, and address the underlying drivers of wildlife trafficking.

EU Farm to Fork Strategy

The **Farm to Fork Strategy**[109] is at the heart of the Green Deal. It addresses comprehensively the challenges of sustainable food systems and recognises the inextricable links between healthy people, healthy societies and a healthy planet. The strategy is also central to the Commission's agenda to achieve the **United Nations' Sustainable Development Goals (SDGs)**[110]. All citizens and operators across value chains, in the EU and elsewhere, should benefit from a just transition, especially in the aftermath of the COVID-19 pandemic and the economic downturn. A shift to a sustainable food system can bring environmental, health and social benefits, offer economic gains and ensure

[108] Preventing Illegal Trade in Wildlife, file:///C:/Users/donnefe/Downloads/090166e5e2d53254.pdf, Ref. Ares(2021)6044041 - 05/10/2021
[109] https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf
[110] https://sdgs.un.org/goals

that the recovery from the crisis leads towards a sustainable path. Ensuring a sustainable livelihood for primary producers, who are still lagging behind in terms of income, is essential for the success of the recovery and the transition.

This also aims at an overall reduction of EU sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030.

Veterinary Medicinal Products

The new **Veterinary Medicinal Products Regulation**[111] updates the rules on the authorisation and use of veterinary medicines. It includes a wide range of measures promoting the prudent use of antimicrobial medicinal products in animals, including a new obligation to monitor and report the use of antimicrobials in animals in the EU. It bans their use for growth promotion and yield increase and those reserved for treatment of infections in humans, in animals and products of animal origin intended for human consumption (also for imported animals & animal products). Other measures relate to new vaccines to control zoonotic diseases, which are crucial to preserving animal health and welfare of both farm and companion animals and to protecting human health from diseases that can be transmitted from animals, thus contributing to the **One Health** approach.

Other measures cover market and use of medicated feed[112], the prudent use of antimicrobials in veterinary medicine[113] and establishing maximum residue limits of pharmacologically active substances in food stuffs of animal origin[114].

Chemicals

Chemical substances can have significant impacts on human and environmental health. There are over 50 pieces of related EU legislation that

[111] Regulation (EU) 2019/6 of the European Parliament and of the Council of 11 December 2018 on veterinary medicinal products and repealing Directive 2001/82/EC (Text with EEA relevance)
[112] Regulation (EU) 2019/4 of the European Parliament and of the Council of 11 December 2018 on the manufacture, placing on the market and use of medicated feed, amending Regulation (EC) No 183/2005 of the European Parliament and of the Council and repealing Council Directive 90/167/EEC (Text with EEA relevance)
[113] Commission Notice, Guidelines for the prudent use of antimicrobials in veterinary medicine, (2015/C 299/04)
[114] Regulation (EU) 470/2009 on the establishment of maximum residue limits of pharmacologically active substances in food stuffs of animal origin

are relevant. The **EUCLEF search facility**[115] lists and allows users to search legal obligations related to chemicals.

The **EU's REACH Regulation**[116] aims to ensure the safe use of chemicals by requiring manufacturers and importers to assess and manage the risks associated with their products. This regulation contributes to both human and environmental health protection.

The **Classification, Labelling and Packaging Regulation**[117] from 2008 aligns the European Union system of classification, labelling and packaging of chemical substances and mixtures to the Globally Harmonised System (GHS). It is expected to facilitate global trade and the harmonised communication of hazard information of chemicals and to promote regulatory efficiency. It complements the REACH Regulation and replaces previous older measures.

Plant Health

The **Plant Law Regulation**[118] aims to modernise the plant health regime, enhancing more effective measures for the protection of the Union's territory and its plants. These aim to ensure safe trade, as well as to mitigate the impacts of climate change on the health of our crops and forests. Different stakeholders will benefit from this new approach:

- Citizens: better protection of landscapes and forests, public and private green spaces, reduced need for pesticide use;

[115] EUCLEF - ECHA (europa.eu)
[116] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
[117] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance)
[118] Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants, amending Regulations (EU) No 228/2013, (EU) No 652/2014 and (EU) No 1143/2014 of the European Parliament and of the Council and repealing Council Directives 69/464/EEC, 74/647/EEC, 93/85/EEC, 98/57/EC, 2000/29/EC, 2006/91/EC and 2007/33/EC

- Growers and farmers: simpler and more transparent documentation (plant passport), better protection of their production, more financial support for fighting pests;
- Other business operators: common operators' register, harmonised traceability;
- Public authorities: EU financial support for the implementation of surveillance and eradication/containment measures.

Human Pharmaceuticals

Antimicrobial Resistance (AMR)

Antimicrobial resistance is a significant threat to public health and addressing it requires a **One Health** approach. The EU has developed an ***EU One Health Action Plan against Antimicrobial Resistance (AMR)***[119] to confront AMR, focusing on reducing the unnecessary use of antibiotics in humans and animals, improving surveillance and monitoring of resistance, and promoting research and innovation in this area.

Secondly, a **Council Recommendation**[120] on stepping up EU actions to combat antimicrobial resistance based on a **One Health** approach has been adopted on 13 June 2023. Its objectives are to foster the prudent use of antimicrobials by setting concrete targets on AMR and antimicrobial consumption in human health.

They recommend to:

- Strengthen One Health National Action Plans on AMR
- Reinforce surveillance and monitoring of antimicrobial resistance and antimicrobial consumption

[119] https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52017DC0339
[120] Council Recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health approach 2023/C 220/01, ST/9581/2023/INIT, OJ C 220, 22.6.2023, p. 1–20

- Strengthen infection prevention and control
- Strengthen antimicrobial stewardship and prudent use of antimicrobials
- Establish targets for AMR and antimicrobial consumption in human health
- Improve awareness, education and training
- Foster research & development, and incentives for innovation and access to antimicrobials and other AMR medical countermeasures
- Increase cooperation between the Member States through in particular the AMR One Health Network[121]
- Voluntary EU targets set for 2030, translated for each national level and developed with ECDC are:
- A 20% reduction of the total consumption of antibiotics in humans,
- At least 65% of the total consumption of antibiotics in humans should be effective (use of the right antibiotic),
- A reduction of infections of three key antibiotic-resistant bacteria, which will apply mainly to hospitals.

The **Nature Restoration Law**[122] is the first continent-wide, comprehensive law of its kind. It is a key element of the **EU Biodiversity Strategy**, which sets binding targets to restore degraded ecosystems, particularly those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. This aims to restore ecosystems, habitats and species across the EU's land and sea areas in order to:

[121] https://health.ec.europa.eu/events/amr-one-health-network_en
[122] Regulation (EU) 2024/https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1991&qid=1722240349976 1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 (Text with EEA relevance)

- enable the long-term and sustained recovery of biodiverse and resilient nature,
- contribute to achieving the EU's climate mitigation and climate adaptation objectives,
- meet international commitments.

C European Non-Legislative Actions relevant to One Health

One Health Education and Training

The Commission promotes **One Health** through training on AMR, zoonoses control and food safety through the **Better Training for Safer Food (BTSF)**[123] initiative. There is furthermore a dedicated **One Health** pillar that covers different **One Health** issues under the BTSF. Finally, there are BTSF training courses also for third countries promoting the **One Health** approach and raising awareness on combatting AMR.

Actions related to Cancer

Europe's Beating Cancer Plan[124] is structured around **four key action areas** with 10 flagship initiatives and multiple supporting actions. It will be implemented using the whole range of Commission funding instruments, with a total of **€4 billion** being earmarked for actions addressing cancer, including from the EU4Health programme, Horizon Europe and the Digital Europe programme.

- **Prevention** through actions addressing key risk factors such as **tobacco** (with the aim to ensure that less than 5% of the population uses tobacco by 2040), **harm related to alcohol consumption, environmental pollution and hazardous substances**[125]. Additionally, a 'HealthyLifestyle4All' campaign is designed to link sport and active lifestyles with health, food and other policies and has the

[123] https://better-training-for-safer-food.ec.europa.eu/training/course/index.php?categoryid=41
[124] https://health.ec.europa.eu/system/files/2022-02/eu_cancer-plan_en_0.pdf
[125] https://knowledge4policy.ec.europa.eu/health-promotion-knowledge-gateway/topic/risk-factors-non-communicable-diseases_en

objective of awareness raising, easier access to sport, physical activity and healthy diets following a holistic approach. To prevent cancers caused by infections, the Commission presented, in January 2024, a proposal for a Council Recommendation on vaccine-preventable cancers[126], focused on boosting the uptake of vaccination against Human papillomaviruses and Hepatitis B virus.

- **Early detection** of cancer by improving access, quality and diagnostics and support Member States ensuring that 90% of the EU population who qualify for breast, cervical and colorectal cancer screenings are offered screening by 2025. A new EU-supported Cancer Screening Scheme has been put forward through a **Council Recommendation on cancer screening**[127] adopted in December 2022, including the ambition to extend cancer screening programmes to lung, prostate, and gastric cancer screening, based on further research. Dedicated funding has been committed to support the implementation of the Council Recommendation.

- **Diagnosis and treatment** through actions to ensure better integrated and comprehensive cancer care and addressing unequal access to quality care and medicines. The Joint Action CraNE[128] and its' follow-up project is making possible the creation of a new EU Network of Comprehensible Cancer Centres that will ensure that 90% of eligible patients have access to such centres by 2030. In addition, several projects[129] have been launched under the new "Cancer Diagnostic and Treatment for All" initiative that are helping Member States to improve access for individuals, cancer patients and survivors to prevention, diagnosis and treatment of cancer through personalised medicine and the use of the latest innovations in cancer care. The **European**

[126] Proposal for a Council Recommendation on vaccine-preventable cancers - European Commission (europa.eu)
[127] Council Recommendation of 9 December 2022 on strengthening prevention through early detection: A new EU approach on cancer screening replacing Council Recommendation 2003/878/EC 2022/C 473/01 and https://cancer-screening-and-care.jrc.ec.europa.eu/en
[128] https://health.ec.europa.eu/non-communicable-diseases/cancer/europes-beating-cancer-plan-eu4health-financed-projects/projects/crane_en
[129] https://health.ec.europa.eu/non-communicable-diseases/cancer/europes-beating-cancer-plan-eu4health-financed-projects/projects_en?f%5B0%5D=gopa_projects_eu4health_projects%3A212

Initiative to Understand Cancer[130] will help identify individuals at high risk from common cancers.

- **Improve quality of life** of cancer patients and survivors, including rehabilitation, potential tumour recurrence, metastatic disease, and measures to support social integration and re-integration in the workplace. With a 'Better Life for Cancer Patients Initiative', a "Cancer Survivor Smart Card" is being developed. A study on quality of life for cancer patients and survivor is planned to be completed in June 2024 aiming to identify common indicators to measure quality of life for cancer patients and survivors across the EU27, Norway and Iceland, document inequalities across countries and provide recommendations on improving data collection.

- **Childhood cancer** is also in the spotlight, with the flagship on 'Helping Children with Cancer Initiative' with actions addressing access to diagnosis and treatment through the new EU Network of Comprehensive Cancer Centres. This will complement the actions implemented by the **European Reference Network for Paediatric Cancer (PaedCAN)**[131], which aims to increase childhood cancer survival and quality of life by fostering cooperation, research, and training, with the goal of reducing current inequalities between EU Member States. A **Youth Cancer Survivors Network** is also up and running.

- Europe's Beating Cancer Plan furthermore aims to address **inequalities across the entire disease pathway**. To do so the **European Cancer Inequalities Registry**[132] was set up to identify trends, disparities and inequalities between Member States and regions, and help guide investment and interventions at EU, national and regional level. It incorporates data on environmental factors influencing cancer risk, namely air quality data and other environmental indicators. This helps monitor exposure to pollutants and its impact on cancer burden across EU regions. It can also point to where targeted action at EU, national, and local levels can effectively contribute to reducing environmental pollution and health inequalities.

[130] https://uncan.eu/
[131] https://paedcan.ern-net.eu/home/about-ern-paedcan/
[132] https://cancer-inequalities.jrc.ec.europa.eu/

The Registry also addresses the need to reduce inequalities through zero pollution, by integrating data on exposure to environmental pollutants and the impact on cancer burden across EU regions.

The Green Deal

The **European Union Green Deal**[133] is a comprehensive plan aimed at making the EU's economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and a just transition for all. One Health is an integral part of this initiative. Within this, One Health principles are applied to various policy areas, including agriculture, food safety, climate change adaptation, biodiversity conservation, and antimicrobial resistance. By adopting a **One Health** approach, the EU aims to promote sustainable agriculture, ensure food and nutrition security, prevent the spread of zoonotic diseases (diseases transmissible between animals and humans) and protect ecosystems. Promoting One Health under the Green Deal involves:

- Promoting sustainable agriculture practices that ensure the prudent use of antimicrobials, minimise the use of pesticides, reduce greenhouse gas emissions, environmental pollution and protect biodiversity.

- Supporting a sustainable bioeconomy where the use of biomass and its associated value chains respect environment and health safety standards.

- Enhancing surveillance and monitoring systems to detect and respond to emerging infectious diseases that pose threats to human and animal health.

- Implementing regulations and standards to ensure the safety and quality of food products, with a focus on preventing contamination and foodborne illnesses, thus contributing to the **Farm to Fork** strategy. This continues to promote sustainable healthy and safe food **by confronting the use of chemical pesticides and nutrient**

[133] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

pollution in agriculture[134], the imprudent use of antimicrobials in animals which is associated with the occurrence of antimicrobial resistance, food and nutrition security and food safety.

- Investing in research and innovation to develop new technologies and solutions for addressing health challenges at the intersection of humans, animals, and the environment, for example on the microbiome.

- Strengthening international cooperation and partnerships to address global health threats and promote sustainable development.

- Supporting biodiversity and ecosystems protection and restoration, contributing to the aims of the EU Biodiversity Strategy 2030.Reducing air, water and soil pollution to levels no longer considered harmful to health and natural ecosystems, in line with the EU's Zero Pollution Action Plan.

- The Ocean and its ecosystems provide essential ecosystem services (biodiversity, food, energy, climate regulation, etc.) including regulating the climate and are at the same time hugely impacted by climate change. Actions undertaken by the EU include protection and restoration of marine ecosystems and biodiversity, preventing and eliminating pollution, decarbonising the fishing sector to reduce dependency on fossil (primarily diesel) fuels, development of offshore wind and ocean energy as part of the solution for achieving its goal of becoming climate neutral by 2050. Other potential actions on ocean health related to over-fishing, pollution, ability to capture CO_2 and plant health underwater.

Overall, the EU's Green Deal integrates One Health principles into its broader agenda for achieving a sustainable and resilient economy that benefits both people and the planet.

[134] Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC and Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (Text with EEA relevance)

D EUROPEAN UNION ACTIONS IN SUPPORT OF THE ENVIRONMENT

A follow on from the **Green Deal** is the **8th Environment Action Programme (EAP)**[135], which will guide European environmental policy until 2030. It has six priority objectives to be achieved:

- achieving the 2030 greenhouse gas emission reduction target and **climate neutrality by 2050** as part of the **Green Deal**[136]

- enhancing **adaptive capacity**, strengthening **resilience** and **reducing vulnerability to climate change** (to combat floods, droughts, wildfires, storms, rising sea levels, and salination of ground water[137]

- advancing towards a **regenerative growth model**, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a **circular economy**, and developing cross-cutting **bioeconomy**[138] solutions, based on biological resources, to address interconnected challenges in food, agriculture, forestry, energy and industry, to better reconcile the objectives of a healthy planet, the well-being of people, and prosperity.

- pursuing a **zero-pollution ambition**, including for air, water and soil and protecting the health and well-being of Europeans. The Zero Pollution Action Plan with its cross-sectoral approach addresses the connections and interrelations between planetary health and human health. Pollution disproportionally affects the most vulnerable groups in our society and the action plan addresses socio-economic aspects in its flagship **"Reducing Health Inequalities through Zero Pollution".**[139]

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[135] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030
[136] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[137] https://climate.ec.europa.eu/climate-change/consequences-climate-change_en
[138] A sustainable bioeconomy for Europe: Strengthening the connection between economy, society and the environment COM/2018/673 final
[139] https://environment.ec.europa.eu/strategy/zero-pollution-stakeholder-platform/actions_en

- Air and noise pollution are the two biggest environmental determinants of human health. The 2030 targets under the Zero Pollution Action Plan include improving air quality to reduce the number of premature deaths caused by air pollution by 55% and reducing the share of people chronically disturbed by transport noise by 30%. The revision of the Ambient Air Quality Directives[140] sets stricter EU air quality standards for air pollutants (sulphur dioxide, nitrogen dioxide / nitrogen oxides, particulate matter (PM10, PM2.5), ozone, benzene, lead, carbon monoxide, arsenic, cadmium, nickel, and benzo(a)pyrene), bringing them closer with the World Health Organisation global air quality guidelines.

- protecting, preserving and restoring **biodiversity**, and **enhancing natural capital EU Strategy on Biodiversity**. The EU has developed a **strategy to halt biodiversity loss and restore ecosystems**[141], recognising the importance of healthy ecosystems for supporting human well-being and resilience to disease.

- The definition of ecosystem health includes soil health and soil organisms, which is a key precondition for human, animal and plant health. Not only that soils host the first stages of life of many insects and pollinators, but they also provide food, regulate the water, carbon, and nutrient cycles, and are instrumental for the resilience to droughts and natural disasters. Concrete links between soil, water and air, recognised in the **EU Soil Strategy**[142]. As specified in the strategy, coordinating water and soil policies is essential to achieving healthy soils and aquatic ecosystems through better soil and water management, including across borders, and reducing the impact of floods on people's health and well-being.

- When it comes to soil and water pollution, new threats are emerging from micropollutants, which need to be addressed. This is supported with ongoing revisions of the lists of pollutants in surface water and

[140] Directive 2008/50/EC, Directive 2004/107/EC, Commission Directive (EU) 2015/1480 and 2011/850/EU
[141] Biodiversity strategy for 2030
[142] Soil strategy for 2030

groundwater and the revision of the **Urban Waste-Water Treatment Directive**[143].

- **reducing environmental and climate pressures** related to production and consumption (particularly in the areas of energy, industry, buildings and infrastructure, mobility, tourism, international trade and the food system)

E EU Decentralised Agencies and One Health

Distinct from the EU institutions, the **Decentralised Agencies** of the European Union are specialist bodies that have been set up to advise both the European Institutions and Member States in areas of their expertise that affect European citizens. They provide services, information, and know-how. Their total budget is approximately 0.8% of the EU's annual budget and each of them reports to one or more supervisory or "parent" Directorates General of the Commission.

Currently there are 37 such agencies spread throughout the European Union who have many and varied tasks. Some have the power to adopt binding rules and/or individual decisions with direct effect, such as the so-called "regulatory" agencies like the **European Chemicals Agency (ECHA)** which is one of the driving forces among regulatory authorities in implementing the EU's main pieces of Chemicals Legislation such as **REACH**[144] and **CLP**[145].

Others help the Commission and/or to Member States, in the form of technical or scientific opinions and/or inspection reports (e.g., the **European Food Safety Authority (EFSA)**, the **European Centre for Disease Prevention and Control (ECDC)** or the **European Medicines' Agency (EMA))**. Yet

[143] Commission Directive 98/15/EC of 27 February 1998 amending Council Directive 91/271/EEC with respect to certain requirements established in Annex I thereof (Text with EEA relevance)

[144] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

[145] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance)

others again focus on connecting the competent national authorities and on organising cooperation between them to gather, exchange and compare information and good practices (e.g., the **European Environment Agency (EEA)**, and the **European Centre for Disease Prevention and Control (ECDC))**.

European Centre for Disease Prevention and Control (ECDC) (Parent DG SANTE)

The **European Centre for Disease Prevention and Control (ECDC)**[146] has a mandate to collect, analyse and share data on over 50 infectious disease topics such as COVID-19, influenza, HIV/AIDS, hepatitis, measles, tuberculosis, antimicrobial resistance and vaccination strategies. Its experts assess risks to Europe and provide guidance to help both Member States and the European institutions to prevent and respond to outbreaks and public health threats.

Specific actions related to **One Health** of recent note include the monitoring and surveillance of zoonoses, the and the provision of online training modules for field workers confronting vector-borne infectious -diseases. It has recently developed and launched a **One Health Technical Framework** contributing to the **One Health Cross Agency Task Force**[147].

European Chemicals Agency (ECHA) (Parent DG ENV, DG GROW, DG SANTE)

The **European Chemicals Agency (ECHA)** manages the technical and administrative aspects of the implementation of the European Union Regulation on the **Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)**[148]. This has the aim of ensuring the safe use of chemicals in all aspects including their release in the environment.

[146] Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004 establishing a European Centre for Disease Prevention and Control
[147] https://www.ecdc.europa.eu/en/publications-data/ecdc-one-health-framework
[148] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

European Environment Agency (EEA) (Parent DG ENV)

The **European Environment Agency (EEA)**[149] is tasked with assisting the EU and its Member States to take informed decisions about improving the environment, integrating environmental considerations into EU policies and moving towards sustainable development. It also develops and coordinates the **European Environment Information and Observation Network (EIONET)**, the network of national environmental bodies set up to help the agency in its work. It provides information on the environment to the public to help them gain a broader understanding of environmental and climate change issues. for example, through the European Environment and Health Atlas[150]. This atlas displays information on how pollution and other environmental factors may affect the health and well-being of Europeans. It also provides information on inequalities in the distribution of environmental risks to health.

The EEA has provided assessments of impacts on human health caused by environmental pollutants as well as other environmental stressors. Recent examples include the briefings and web reports on veterinary antimicrobials[151], environmental and occupational cancer risk factors[152] and the impact of air pollution on children's health[153].

European Food Safety Authority (EFSA) (Parent DG SANTE)

As a result of the mad cow crisis and other food related- health threats, the **European Food Safety Authority (EFSA)**[154] was set up to provide independent scientific advice on existing and emerging food risks. This advice

[149] Regulation (EC) No 401/2009 of the European Parliament and of the Council of 23 April 2009 on the European Environment Agency and the European Environment Information and Observation Network and https://www.eionet.europa.eu/

[150] EEA, European Environment and Health Atlas: https://discomap.eea.europa.eu/atlas/

[151] EEA (2024), Veterinary antimicrobials in Europe's environment: a One Health perspective. Available at: https://www.eea.europa.eu/publications/veterinary-antimicrobials-in-europes-environment

[152] EEA (2022), Beating cancer — the role of Europe's environment. Available at: https://www.eea.europa.eu/publications/environmental-burden-of-cancer/beating-cancer-the-role-of-europes

[153] EEA (2023), Air pollution and children's health. Available at : https://www.eea.europa.eu/publications/air-pollution-and-childrens-health

[154] Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety

informs European laws, rules and policymaking – and so helps protect consumers from risks in the food chain.

Its remit covers food and feed safety, nutrition, animal health and welfare, plant protection and plant health. Its work that is most relevant to **One Health** involves gathering scientific data and expertise, providing independent, up-to-date scientific advice on food safety issues, communicating its scientific work to the public, cooperating with EU countries, international bodies, and other stakeholders and boosting trust in the EU's food safety system by providing dependable advice.

European Medicines Agency (EMA) (Parent DG SANTE)

According to the Regulation establishing it[155], the main responsibility of the **European Medicines Agency (EMA)** is to be responsible for coordinating the existing scientific resources put at its disposal by Member States for the evaluation, supervision and pharmacovigilance of medicinal products for human use and of veterinary medicinal products. More specifically, it coordinates the scientific evaluation of centrally authorised medicinal products (those that are authorised at EU level) and the monitoring of medicinal products authorised in the European Union. It also provides scientific advice to the Commission and the Member States on the evaluation and use of those products. Via the **Environmental Risk Assessment** of medicinal products, EMA also protects the environment. Through its expert committees, it develops technical guidance and provides advice to marketing authorisation applicants on the required tests and trials necessary to demonstrate the quality, safety and efficacy of medicinal products. The scientific advice and guidance provided include all regulatory aspects related to **One Health** issues such as **antimicrobial- -resistance**, responsible use of antimicrobials, the development of new products and information gathering on the subject so as to guide future policy and research.

[155] Regulation (EC) No 726/2004 of the European Parliament and of the Council of 31 March 2004 laying down Union procedures for the authorisation and supervision of medicinal products for human and veterinary use and establishing a European Medicines Agency (Text with EEA relevance)

Interagency Collaborations on One Health

In 2022 an inter-agency task force on **One Health**[156], involving **ECDC, ECHA, EFSA, EEA and EMA** was established. This task force identified a series of priority work areas common to all of them to strengthen inter-agency collaboration, including mutual strategic direction and policy support, research coordination, stakeholder engagement, and joint procurement and activities[157].

It specifically recognises that the scientific evidence base for One Health action needs to be strengthened. This involves obtaining a scientific opinion on **One Health** from the **Group of Chief Scientific Advisers to the Commission**. Secondly, it underlines the need to mainstream the One Health approach in all their individual areas of scientific advice and risk assessments. Intersectoral One Health coordination mechanisms including human, animal and environmental sectors will be established and agencies' individual surveillance and early warning systems will be aligned with the One Health concept. Finally, **One Health** educational and training programmes will be suitably adjusted to design and implement **One Health** initiatives and policies.

European Climate and Health Observatory

This follows another application of the **One Health** approach in February 2021, when the Commission launched **the European Climate and Health Observatory**[158]**.** Hosted by the **European Environment Agency (EEA)**, this partnership between it, the **European Commission, the,** the **European Centre for Disease Prevention and Control (ECDC),** the **European Food Safety Authority (EFSA)** and two other organisations (the **Lancet Countdown in Europe**, and the **World Health Organisation Regional Office for Europe**) allows policy and decision-makers to visualise actionable knowledge on the past, current, and projected climate-related risks to human

[156] Cross-agency knowledge for One Health action, Joint statement by European Union Agencies, European Centre for Disease Prevention and Control (ECDC), European Chemicals Agency (ECHA), European Environment Agency (EEA), European Food Safety Authority (EFSA), European Medicines Agency (EMA), 13 November 2023, https://www.efsa.europa.eu/sites/default/files/2023-11/one-health-2023-joint-statement.pdf
[157] All news - ECHA (europa.eu)
[158] https://climate-adapt.eea.europa.eu/en/observatory

health at all life stages and in all settings, as well as on policies and actions addressing these climate-related health risks, within the broader context of the One Health approach. On this basis, it will help them to act and respond to these risks, in keeping with the provisions of the **EU Climate Law**[159] and the **Green Deal**[160].

Its vision for 2030 is that:

- National and sub-national health policies and systems can integrate adaptation more systematically and consistently.
- Public authorities have greater capacity to anticipate and prevent climate-related threats to health in a timely manner.
- Observatory users can monitor key climate-related health risks, impacts and adaptive responses through robust indicators.
- The health community in the EU is climate-literate and better involved into adaptation decision-making.
- Evidence-based efficient, effective and inclusive adaptation solutions and public health and healthcare interventions are widely known. Observatory users can monitor key climate-related health risks, impacts and adaptive responses through robust indicators.

F RESEARCH AND INNOVATION POLICY

The EU Framework for Research and Innovation – Horizon Europe

Through **Horizon Europe**[161] the EU provides funding for numerous research and innovation projects that address health challenges from a One Health perspective. This includes funding for interdisciplinary research projects that

[159] Regulation (EU) 2021/1119 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')
[160] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[161] Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013 (Text with EEA relevance)

explore the connections between human health, animal health, and the environment, the relation between zoonotic diseases and biodiversity, planetary health, nature-based therapy for health and wellbeing, health impacts of climate change, as well as initiatives to develop new technologies and strategies for disease prevention and control (including on food systems through the Food 2030 R&I framework).

The One Health approach can prevent outbreaks of zoonotic diseases in animals and people, improving food safety and security, and so contributing to co-benefits and systems thinking. R&I is needed to support the implementation of a One Health approach; to integrate knowledge, data and expertise across a wide range of disciplines, sectors and actors; and to attain optimal health outcomes that account for the inextricable link between the health of humans, animals, plants and their shared environment. This will enable assessments that support the necessary transition to sustainable food systems.

The ***One Health European Joint Programme***[162], launched in 2018 is a **Horizon Europe** research initiative that takes the form of a partnership between 38 acclaimed food, veterinary and medical laboratories and institutes across 19 Member States in Europe. This collaborative programme serves as a platform for co--funding a wide array of joint research and integrative projects which stimulated the cross sector and cross border collaboration and proposed practical methodologies to support the ongoing discussions on One Health. These projects cover:

- the design and implementation of surveillance activities;
- laboratory methods – harmonising protocols and sharing best practices;
- producing and organising reference materials and data;
- methods and models for the interpretation of surveillance data;
- cross-sector communication of such data; and

[162] https://onehealthejp.eu/

- action (prevention and response, with a monitoring system for sharing of best intervention practices).

Another is the European Partnership for the Assessment of Risks from Chemicals (PARC)[163], which aims to develop next-generation chemical risk assessment to protect human health and the environment.

More broadly, the project cluster European Human Exposome Network[164] looks at exposure not only to chemicals but overall environmental exposures throughout one's life.

The European Biodiversity Partnership has also funded specific projects around the biodiversity-health nexus: "Biodiversity and its influence on animal, human and plant health.

The EU4Health Programme

The EU4Health Programme[165] provides funding for projects that promote public health and address health inequalities across Europe. This programme supports also initiatives that align with a **One Health** approach, such as surveillance of infectious diseases, risk assessment, and capacity building in healthcare systems.

[163] https://www.eu-parc.eu/
[164] https://www.humanexposome.eu/
[165] Regulation (EU) 2021/522 of the European Parliament and of the Council of 24 March 2021 establishing a Programme for the Union's action in the field of health ('EU4Health Programme') for the period 2021-2027, and repealing Regulation (EU) No 282/2014 (Text with EEA relevance)

ANNEX 6 - REFERENCES

Bourque F., Cunsolo Willox A., Climate change: the next challenge for public mental health? Int. Rev. Psychiatry. 26 (2014) 415–422, https://doi.org/10.3109/09540261.2014.925851

Charlson F., Ali S., Benmarhnia T., Pearl M/, Massazza A., Augustinavicius J., et al., Climate change and mental health: a scoping review, Int. J. Environ. Res. Public Health 18 (2021), https://doi.org/10.3390/ijerph18094486

Coffey Y., Bhullar N., Durkin J., Islam M.S., Usher K., Understanding eco-anxiety: a systematic scoping review of current literature and identified knowledge gaps, J. Clim. Chang. Heal. 3

De La Rocque S. Et al, (2019) One Health operations: a critical component in the International Health Regulations Monitoring and Evaluation Framework. Rev Sci Tech. 2019 May;38(1):303-314. doi: 10.20506/rst.38.1.2962.

De la Rocque et al. (2023) One health systems strengthening in countries: Tripartite tools and approaches at the human-Animal-environment interface BMJ Global Health 8(1):e011236 DOI: 10.1136/bmjgh-2022-011236

dos S. Ribeiro C., van de Burgwal L.H.M, Regger B. J. Overcoming challenges for designing and implementing the One Health approach: A systematic review of the literature, One Health, 2019, 100085.

Galway L.P., Beery T., Jones-Casey K., Tasala K., Mapping the solastalgia literature: a scoping review study, Int. J. Environ. Res. Public Health 16 (2019) 2662, https://doi.org/10.3390/ijerph16152662

FAO, UNEP WHO, and WOAH. 2023. One Health and the United Nations Sustainable Development Cooperation Framework Guidance for United Nations country teams. Rome. https://doi.org/10.4060/cc5067en

Horton R., 1, Beaglehole R., Bonita R., Raeburn J., McKee M., Wall S. (2014), From public to planetary health: a manifesto. Lancet. 2014 Mar 8;383(9920):847 PMID: 24607088 DOI: 10.1016/S0140-6736(14)60409-8

McGorry P.D., Mei C., Dalal N., Alvarez-Jimenez M., Blakemore S., Browne V. (2024) The Lancet Psychiatry Commission on youth mental health. Lancet Psychiatry Volume 11, Issue 9

Mwatondo A. et al. (2023) A global analysis of One Health Networks and the proliferation of One Health collaborations Lancet. 2023 Feb 18;401(10376):605-616. doi: 10.1016/S0140-6736(22)01596-3. Epub 2023 Jan 19.

M. Murray, J. Backley, K. A. Byers, K. Fake, E. W. Lehrer, S. B. Magle, C. Stone, H. Tuten, C. J. Schell, One Health for all: Advancing human and ecosystem health in cities by integrating an environmental justice lens, Annu Rev Ecol Evol Syst (2022), 53:403-26 https://doi.org/10.1146/annurev-ecolsys-102220-031745

OECD 2023 , Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris, https://doi.org/10.1787/7a7afb35-en

One Health High-Level Expert Panel (OHHLEP), OHHLEP Annual Report 2021.

OHHLEP 2022: One Health High-Level Expert Panel (OHHLEP), Adisasmito WB, Almuhairi S, Behravesh CB, Bilivogui P, Bukachi SA, et al. (2022) One Health: A new definition for a sustainable and healthy future. PLoS Pathog 18(6): e1010537. https://doi.org/10.1371/journal.ppat.1010537

Pelican K. et al, (2019), Synergising tools for capacity assessment and One Health operationalization, Revue Scientifique et Technique (International Office of Epizootics), May, 38(1)

OHHLEP 2023: One Health High-Level Expert Panel (OHHLEP), Hayman D. et al. (2023) Developing One Health surveillance systems. One Health Volume 17, December 2023, 100617

OHJPA 2022: Quadripartite Organizations (Food and Agriculture Organization of the United Nations (FAO), Nations Environment Programme (UNEP), World Organisation for Animal Health (WOAH), and the World Health Organization (WHO)) (2022), One health joint plan of action (2022–2026): working together for the health of humans, animals, plants and the environment, October 14 2022.

Ribeiro C.D., van de Burgwal L.H., Regeer B.J. (2019) Overcoming challenges for designing and implementing the One Health approach: A systematic review of the literature, One Health, Jun 1:7.

SAPEA (2024). One Health governance in the European Union. Berlin: SAPEA. doi:10.5281/zenodo.14055991Weatherly, C., Carag, J., Zohdy, S., Morrison M. (2023) The mental health impacts of human-ecosystem-animal relationships: A systematic scoping review of Eco-, Planetary, and One Health Approaches. One Health. 17(2023). 100621 https://doi.org/10.1016/j.onehlt.2023.100621

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One Health means recognition that human health, animal health and the health of our environment are inherently connected. They form a common system that demands to be treated as a whole. All too often, policy areas like agriculture, biodiversity and crisis management are treated in isolation, rather than in recognition of their place as part of a larger, interconnected ecosystem.

This scientific opinion by the Group of Chief Scientific Advisors (GCSA) provides recommendations to support the successful implementation of EU policies deriving from a One Health approach. It focusses on the forms of management and governance that are best suited for encouraging collaboration across the different sectors that make up One Health whilst minimising any unintended consequences that might result from such new in approach.

This opinion is published in the context of the Scientific Advice Mechanism (SAM) which provides independent scientific evidence and policy recommendations to the European institutions by request of the College of Commissioners.

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