



26 May 2023

Scoping workshop outcome

**Cross-sectoral
evidence-based
governance for
One Health**

This document has been produced by the Scientific Advice Mechanism to the European Commission.

The text of this work is licensed under the terms of the Creative Commons Attribution licence which permits unrestricted use, provided the original author and source are credited. The licence is available at <http://creativecommons.org/licenses/by/4.0>. Images reproduced from other publications are not covered by this licence and remain the property of their respective owners, whose licence terms may be different. Every effort has been made to secure permission for reproduction of copyright material. The usage of images reproduced from other publications has not been reviewed by the copyright owners prior to release, and therefore those owners are not responsible for any errors, omissions or inaccuracies, or for any consequences arising from the use or misuse of this document.

The information, facts and opinions set out in this report are those of the authors. They do not necessarily reflect the opinion of the European Union or the European Commission, which are not responsible for the use which may be made of the information contained in this report by anyone.

- ◆ DOI 10.5281/zenodo.14170249
- ◆ Downloadable from <https://scientificadvice.eu/advice/one-health-governance-in-the-european-union/>

Scientific Advice Mechanism

to the European Commission

Cross-sectoral evidence-based governance for One Health

Scoping workshop outcome

26 May 2023

Version history

Version	Date	Summary of changes
1.0	15 November 2024	First published version

List of abbreviations

DG SANTE	Directorate-General for Health and Food Safety
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
ECHA	European Chemicals Agency
EEA	European Environment Agency
EFSA	European Food Safety Authority
EIT	European Institute of Innovation & Technology
EMA	European Medicines Agency
EU-OSHA	European Agency for Safety and Health at Work
EU	European Union
EUROFUND	European Foundation for the Improvement of Living and Working Conditions
FAO	Food and Agriculture Organization of the United Nations
GCSA	Group of Chief Scientific Advisors
OHEJP	One Health European Joint Programme
OHHLP	One Health High-Level Panel
OH JPA	One Health Joint Plan of Action
SAM	Scientific Advice Mechanism to the European Commission
SAPEA	Scientific Advice for Policy by European Academies
UN	United Nations
UNEP	United Nations Environment Programme
WHO	World Health Organisation
WOAH	World Organisation for Animal Health

Table of contents

Workshop objectives and structure	7
<i>Objectives</i>	7
<i>Format</i>	8
Converging towards an enlarged and complex definition of One Health	8
<i>A new definition of One Health</i>	9
<i>The complex dynamic interlinkages between systems within One Health</i>	10
<i>Intervening on the complex nexus between human and animal health and the environment according to One Health</i>	15
<i>About the costs and benefits of the One Health approach</i>	17
Requirements for One Health operationalisation through shared governance	18
<i>Data governance</i>	18
<i>Training and education</i>	19
<i>Expanding the understanding of One Health: involving more actors in policy operationalisation</i>	19
<i>Examples of joint One Health collaborations and initiatives in Europe at the level of agencies</i>	20
Annexes	22
<i>Bibliography</i>	22
<i>Further bibliography</i>	24
<i>List of participants and other attendees</i>	26
<i>Programme</i>	27

The Scientific Advice Mechanism (SAM) provides independent scientific evidence and policy recommendations to the European institutions by request of the College of Commissioners.

The SAM consists of three parts.

The Group of Chief Scientific Advisors

The Group of Chief Scientific Advisors is a key part of the Scientific Advice Mechanism. Their role is to provide independent scientific advice and policy recommendations to the College of European Commissioners to inform their decision-making, and thus contribute to the quality of EU legislation.

The Group is composed of up to seven Advisors. They are chosen for their outstanding level of expertise, covering a wide range of scientific fields.

The goal is to have a broad vision which collectively reflects an understanding of important scientific developments, including interdisciplinary and multidisciplinary research.

SAPEA

SAPEA's role in the Scientific Advice Mechanism is to provide independent, high-quality reviews of the evidence to inform the policy recommendations made by the Group of Chief Scientific Advisors.

SAPEA is a consortium of Academy Networks, funded by Horizon Europe, representing a large number of academies from different countries. Through these Networks, they bring together outstanding expertise from natural sciences, engineering and technology, medical, health, agricultural and social sciences, and the humanities.

The secretariat

The Scientific Advice Mechanism is supported by the SAM secretariat, established within the Directorate-General for Research and Innovation of the European Commission.

This secretariat:

- acts as a liaison between the Advisors, SAPEA, and the European Commission
- analyses the policy background to the requests for advice
- supports the Group of Chief Scientific Advisors in their work
- works with SAPEA and the Advisors to communicate about the work of the SAM

Workshop objectives and structure

Objectives

A scoping workshop on *Cross sectoral evidence-based governance for One Health* was organised on 26 May 2023 to support the finalisation of a scoping paper with key questions for the Group of Chief Scientific Advisors of the EU as part of the Scientific Advice Mechanism to the European Commission (SAM). In the case of particularly complex topics where clear-cut questions are not readily apparent, such workshops provide an important opportunity to clarify concepts, address crucial aspects to be tackled and delimit the scope of the scientific advice that can be provided to policy makers.

In line with lessons learned from the COVID-19 pandemic, the European Commission created a One Health Directorate hosted in the Directorate-General for Health and Food Safety comprising two main areas: public health and food sustainability, including animal and plant health. This newly-established Directorate consists of five teams:

- a unit on antimicrobial resistance and human nutrition
- a unit dedicated to communication
- two units aimed at managing bilateral and multilateral relations, seeking to integrate and promote a One Health approach among external audiences and the media as well as among other institutions and member states
- a dedicated unit to handle interinstitutional relations in full recognition of the cross-sectoral nature of One Health

Cross-sectoral governance is a fundamental dimension of this Directorate, implying high-level and continuous horizontal cooperation with other Directorates-General on issues such as agricultural production, farming, emergency management, climate change, environment and urbanisation. Such a cross-sectoral governance perspective is at the core of the forthcoming request to SAM for scientific advice.

We face a triple planetary crisis concerning the intertwining of climate change, biodiversity loss and pollution, that demonstrates the immense power of nature and the interconnectedness between human health and wellbeing, economy and the environment. The One Health approach that the Commission wishes to endorse is comprehensive and encompasses a broader perspective, moving beyond more traditional approaches that focus on antimicrobial resistance or the collaborative work between veterinarians and medical doctors (Lerner & Berg, 2015). In order to operationalise this change in approach, beyond a legal framework, manpower and financial capacity are needed to ensure proper guidance and communication, including from the Commission to external actors. Political support is also needed at the highest level.

The implementation and operationalisation of One Health are a complex undertaking. Developing a stepwise approach is key to facilitating its operationalisation. This will be the task of the Scientific Opinion, which will provide insights into the most effective means to operationalise One Health at the European Commission level.

Format

The workshop was designed to give the opportunity to policy officers from different European Commission Directorates-General with interest and competences related to One Health to engage with external experts from academic and research institutions as well as from European agencies (in particular EFSA, ECDC, EEA, EMA, EU-OSHA and EUROFUND). The workshop was divided into three sessions, which each addressed a specific question:

- What governance models have been successful in applying One Health?
- What interdisciplinary arrangements have proven effective and what criteria have been proposed to measure progress towards One Health?
- What are good examples of successful One Health integration of environmental, urban planning, climate change adaptation and mitigation?

Each session was divided into two parts. In the first and most extensive segment, external experts, including experts from the agencies, presented their views on the question at stake, followed by a discussion during which policy officers provided comments and asked questions. The workshop featured the participation of ten eminent external experts (see “List of participants and other attendees” on page 28) invited to represent a wide range of disciplinary backgrounds and expertise, including ecologists, medical doctors and urban planners.

Converging towards an enlarged and complex definition of One Health

In recent years, the importance and concern surrounding the interconnection between human, animal and environmental health has gained momentum globally, including at government level (Barton Behravesh, 2019; Sinclair, 2019).

During the 2010 Avian Influenza pathogen outbreak, the World Health Organisation, the Food and Agriculture Organisation and the World Organisation for Animal Health (then the Office International des Epizooties) joined forces to tackle the health risks due to zoonoses and animal diseases. This collaboration was essential given the implications for food safety and security, emphasising the need for multisectoral collaboration. In March 2022, the United Nations Environment Programme joined this group now known as the Quadripartite, thus incorporating the environmental component.

In the same year, the Quadripartite published the One Health Joint Plan of Action, which aims to strengthen collaboration, communication, capacity-building and coordination across all sectors responsible for addressing health concerns at the human-animal-plant-environment interface.

The plan focuses on supporting and expanding capacities in six areas:

- enhancing One Health capacities to strengthen health systems
- reducing the risks from emerging and re-emerging zoonotic epidemics and pandemics
- controlling and eliminating endemic zoonotic, neglected tropical and vector-borne diseases
- strengthening the assessment, management and communication of food safety risks
- curbing the silent pandemic of antimicrobial resistance
- integrating environmental concerns into One Health

Significant gaps still need to be filled in order to fully implement the Joint Plan of Action, both at national and European Union level.

A new definition of One Health

The reference definition currently used has been provided by the One Health High-Level Panel, the advisory group to the Quadripartite, and is fully embraced in the Joint Plan of Action:

One Health is 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 interdependent. 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.

(One Health High-Level Panel, 2022)

The progressive expansion of the One Health approach is effectively captured in Figure 1 on page 10, which shows the shift from species-scale dynamics to systems dynamics, integrating a deeper understanding of the interactions between social and ecological systems, and their mutual and intrinsic interlinkages and exchanges. It also underscores the impact of human societies on vital planetary systems on which human and ecosystems life depend. Limiting One Health to simple interactions between animal and human health, even when including food chains and certain environmental determinants such as water, soil and air, does not adequately address the multiple level interlinkages, interdependencies and complex feedback loops that exist. Complex and dynamic interlinkages characterise our planetary environment. However, scientists stress that, because of human intervention, changes have been occurring at an unprecedented pace in the last century and increasingly over the last decades (IPCC, 2021; Watts et al, 2021).

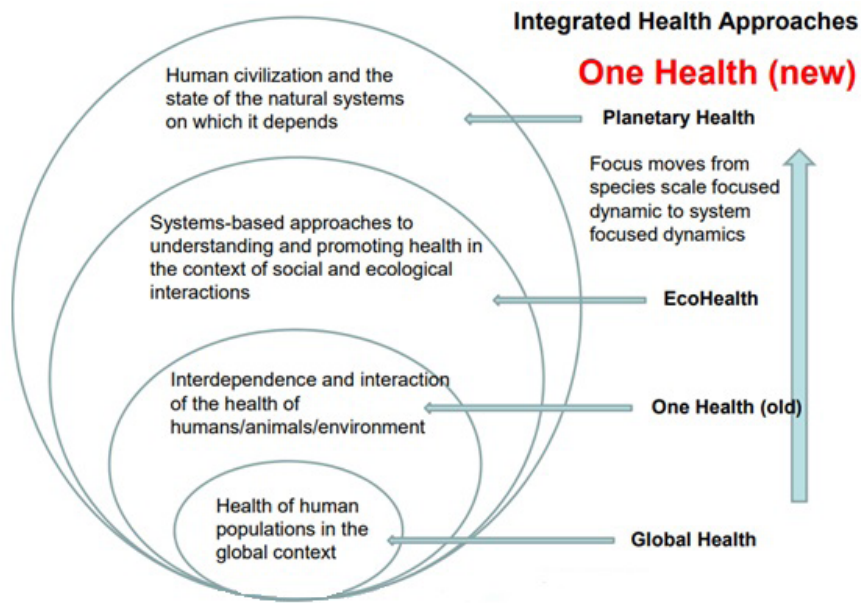


Figure 1. One Health dimensions.
(Grützmacher and Mettenleiter)

The complex dynamic interlinkages between systems within One Health

Figure 2 summarises the High-Level Panel’s definition. However, it does not seem to address in full the multiple interlinkages between the different systems and subsystems, and the feedback loops that exist, as shown in Figure 3 on page 11. Operationalising these interlinkages requires more than just identifying them; they need to be analysed using metrics and actionable steps taken to address the challenges identified.

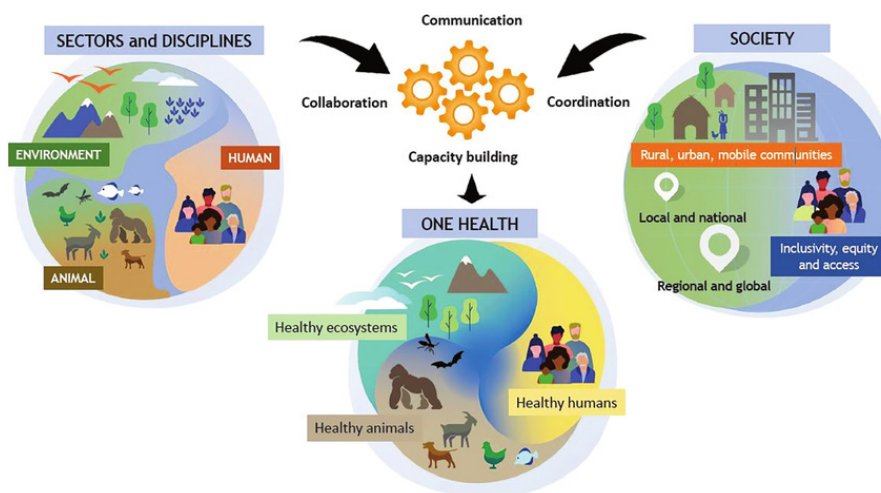


Figure 2. Integrative view of a One Health approach
(OHHLEP, 2022)

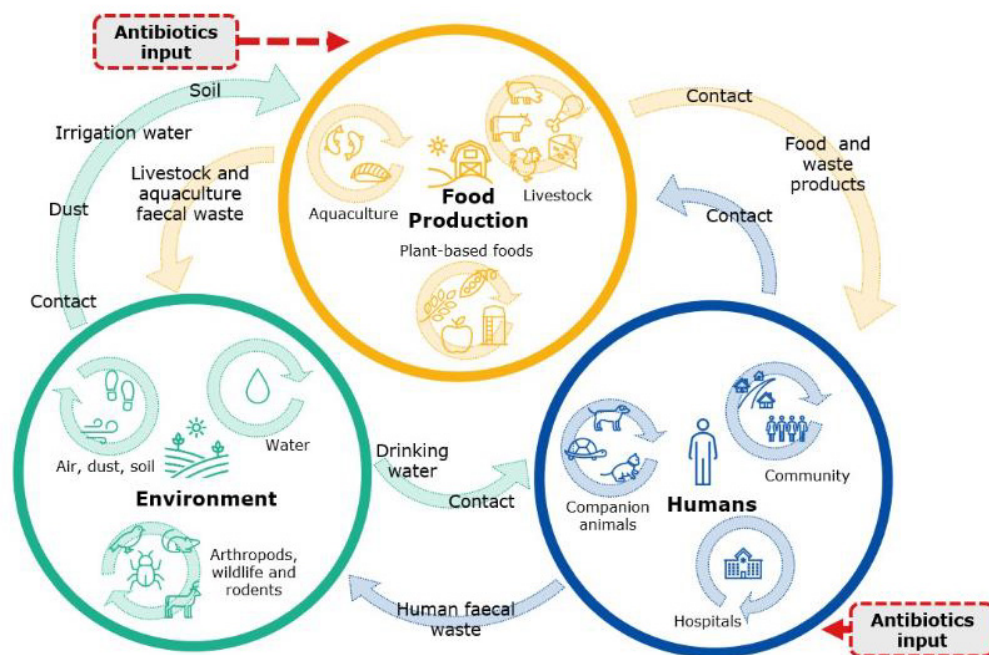


Figure 3. Interactions and feedback loops between humans, food production and environmental systems (JIACRA III, - Antimicrobial consumption and resistance in bacteria from humans and animals, 2021)

The One Health European Joint Programme¹ launched in 2018 was a research initiative and collaborative programme which served 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
- action — prevention and response, with a monitoring system for sharing of best intervention practices

While the programme focused on the interface between animal, human health and the food system, some funded projects also address the integration of environmental and ecosystem studies (see for example projects DISCOVER², FED-AMR³ and MEME⁴).

1 <https://onehealthjep.eu/>

2 <https://onehealthjep.eu/projects/foodborne-zoonoses/jrp-discover>

3 <https://onehealthjep.eu/projects/antimicrobial-resistance/jrp-fed-amr>

4 <https://onehealthjep.eu/projects/emerging-threats/jrp-meme>

The importance of integrating the environment into the One Health paradigm more convincingly was largely debated in the workshop. Indeed, as clearly conveyed in Figure 4, “the environment functions as a reservoir, where substances and nutrients are accumulated and transported” (WHO, 2022), playing a vital role in the processes through which interlinkages between species and with ecosystems are taking place. It is also a reservoir of pathogens and chemicals, including chemicals produced and transformed by humans, that may accumulate and also become integral part of the food chain. In this sense, the environment constitutes the ‘substrate’ where such processes (across and between species, transformation of substances in ecosystems) take place. Therefore “the environment acts also as a health mediator, producing positive or negative effects on human and animal health, depending on the health condition of the environment itself” (WHO, 2022).

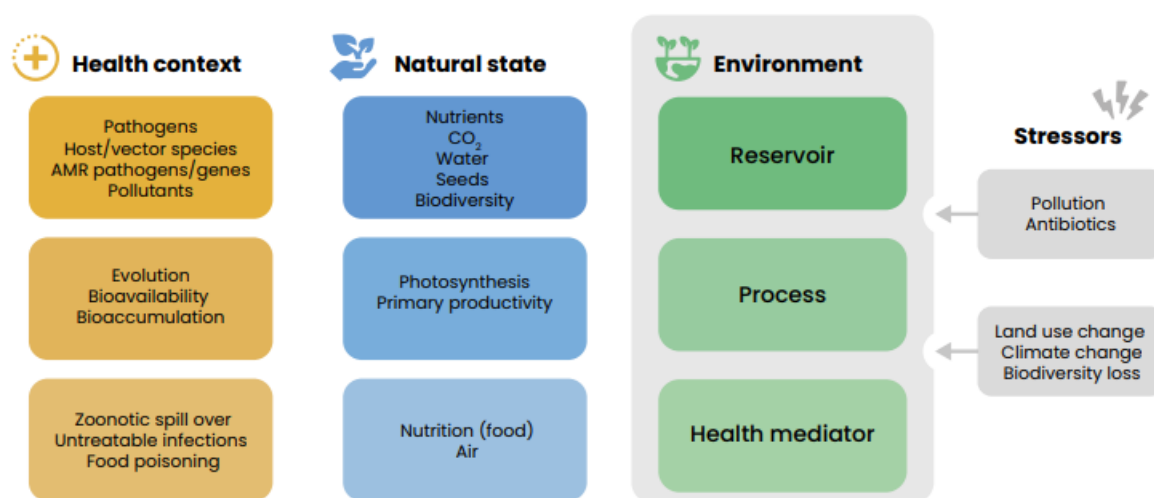


Figure 4. The role of the environment, in the context of One Health, in animal-mediated diseases (WHO, 2022)

Pollution and changes in land use, including the conversion of forests to cultivable land, induce significant pressures and stresses on the environment. These alterations disrupt the dynamic processes within the environment which can have adverse consequences on the health of animals and humans (Allen et al, 2017). A number of such alterations of processes and interactions were discussed during the workshop.

The Living Planet Index shows that biodiversity levels on the planet are declining.⁵ Along with deforestation, changes in land use, food production systems and changes in biodiversity, this has been put forward as one of the reasons for the emergence and reappearance of certain infectious or parasitic diseases (Morand & Lajaunie, 2018). The loss of biodiversity is also leading to an increasing number of non-communicable diseases such as chronic respiratory disease, and of mental disorders (Morand & Lajaunie, 2018; Crump et al, 2021). Conversely, preservation of biodiversity can enhance health conditions within the settled population.

⁵ Data from Living Planet Index (LPI) is available for consultation here: https://www.livingplanetindex.org/latest_results

Land use changes can have an impact on the quality of soil, water and air. In rural areas, agricultural practices including intensive breeding and the use of chemicals can alter the quality of groundwater and soil. Bioaccumulation of heavy metals in the food chain is particularly dangerous as it is not always easy to trace and monitor.

Intensive breeding increases the probability of infections (Marani et al 2021), raising the risk of spillover from animals to humans (Steinfeld et al, 2006).

Concurrently, climate change is affecting health in multiple ways (Patz et al, 2013). Hazards associated with climate change such as floods, droughts and heatwaves have direct effects on mortality and on the availability and quality of freshwater. Climate change is driving some species to migrate from their traditional habitats, thus introducing new pathogens to different regions (Carlson et al, 2022). In addition, climate-induced changes in temperatures, precipitation and humidity are altering the geographic range of disease vectors (e.g., mosquitoes, ticks) and influencing the suitability of certain regions for disease transmission (IPCC, 2021). For example, Europe is experiencing a steady increase in the risk of transmission for the West Nile virus infection, a disease that only led to sporadic cases until the mid-1990s.

Changes in landscapes not only trigger shifts in the dissemination and geographic distribution of pathogens, their vectors and diseases, but also impact antimicrobial resistance: water bodies and wastewater treatment facilities and the air contribute to the transport of antimicrobial residues and antimicrobial resistant genes. The relation between antimicrobial resistance and these new environmental conditions, including deteriorating ecosystems, is still insufficiently understood and monitored.

Pollution in air, water and soil impacts human health and is one of the main drivers of biodiversity loss. Air pollution and noise pollution are known to be the two biggest environmental determinants of health impacts. There are also indications that mixtures of air pollutants and noise may have a bigger health impact than the individual impacts of these pollutants might suggest, or that combinations of various kinds of pollution may be more dangerous, especially for vulnerable population groups.

Soil health and the health of soil organisms are key preconditions for human, animal and plant health. For example, research has shown that children playing in healthy forest soils have stronger immune systems.⁶ Soils not only host the first stages of life of many insects and pollinators, but also provide us with food, regulate the water, carbon, and nutrient cycles, and are instrumental for the resilience to droughts and natural disasters and protect us from pollution by breaking down complex contaminants.

When it comes to air, soil and water pollution, new threats are emerging which need to be addressed, in particular from micropollutants. Such pollutants are difficult to remove from the environment, including during water treatment. They accumulate in seafood, and may have cumulative effects on human health, for example affecting endocrine function. At the same time, polluted, contaminated

⁶ See for example, <https://www.nature.com/articles/s41467-021-25213-2>

environments weaken the immune system of populations exposed to new pathogens, making them even more vulnerable.

The relationship between health and environment in cities, and its relevance to modern urban planning, is another issue that can be addressed through a One Health perspective. This needs to be given due consideration as urban populations now exceed rural populations for the first time in history and are expected to constitute a staggering 70% of the total population by 2050, a total of six billion urban dwellers (United Nations, 2022).

The first stages of the industrial revolution in the 19th century, where cities rapidly expanded, saw unprecedented problems of pollution and crowdedness. These prompted urbanists, many of whom were also medical doctors, to respond. Nowadays, in some cities, people's health conditions are geolocated in order to correlate local environmental conditions in terms of air, water, soil, outdoor and indoor pollution, with health effects. Such geolocation also allows the analysis of the positive impact of green spaces in the vicinity of houses or workplaces as well as the impact of slow mobility (bicycle and walking) on people's health. Although, as the granularity of such monitoring becomes more precise, issues of privacy and sensitivity of such data arise, it can provide very useful insights into the local sources of contamination or determinants of health.

In fact, the overlay of maps with the geolocation of urban functions, health and environmental data allows us to effectively highlight the influence of the urban environment and the distribution of services on health. For example, it is possible to map how effective is the proximity to health care facilities and the availability of territorial healthcare centres. This became very evident during the COVID-19 pandemic. In the same way, it is possible to analyse the health effects on citizens who live close to contaminated areas. From an environmental perspective, industrial or former industrial areas in cities are particularly prone to the accumulation of harmful chemicals.

The examples provided during the workshop, supported by extensive literature and research, point to the need to focus on the systemic dimension of the relationship between the different dimensions of One Health. This includes examining the interplay between different environments and their role in the emergence and resurgence of both communicable and non-communicable diseases, as well as between the degradation of environmental resources and habitats and the development or resurgence of threats to health. There are evident emerging risks within the food chain and system that cannot be considered only at local level but require to be investigated across multiple scales simultaneously. For example, new consumption patterns in Europe may have negative impacts on other areas of the world. Delving deeper into the nexus between biodiversity, water, food and health therefore becomes imperative.

Intervening on the complex nexus between human and animal health and the environment according to One Health

Implementing the One Health approach not only requires a clear analysis and assessment of the nexus between biodiversity, water, food, and health, but also the development of tools and strategies for successful action. It also needs to demonstrate the advantage of such an approach over traditional ones. To this effect, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services is preparing a comprehensive report on the nexus, the first draft of which can be found online.⁷

Intervention within the One Health framework can be categorised into three key phases: prevention, preparedness and response.

- The definition of **prevention**, as highlighted in the White Paper published by the One Health High-Level Panel,⁸ is still subject to debate. In the context of public health, prevention typically means averting the occurrence of a disease entirely. The White Paper defines it as “the critical first step, i.e. preventing the spillover of pathogens from animals to humans”. A key means of prevention is surveillance and monitoring for early detection of possible potential sources of risk in the food chain and in the environment. The Nature4Health project,⁹ developed under the leadership of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, is a good illustration of this. Other examples of action on the environment to reduce health related risks at the local level can be found in the report *Supporting biocultural diversity, sustainability and society* (UNESCO Biosphere Reserves, 2020). In addition to this, a case study discussed in the workshop which focuses on integrated surveillance of infectious diseases both in the environment and the human-animal interface (Zinsstag et al, 2020) showed through a socio-ecological system analysis¹⁰ that the timelier detection of zoonotic pathogens in the environment, whether in wildlife or domestic animals, and the better human, animal and environmental surveillance communicate with each other, the lower the costs. Delaying action until the pathogen affects livestock escalates the cost, and further delays to the point that it affects public health imply even higher costs. Bringing together surveillance systems and moving towards integrated services is therefore imperative. Considering the wider nexus between health, environment and biodiversity, a study in New Zealand has found that children living in areas rating high in the normalised difference vegetation index have a lower chance of developing asthma (Donovan et al, 2018). This is an example of how biodiversity preservation may provide additional ecosystems services also to human health.

7 <https://www.ipbes.net/sites/default/files/inline-files/Nexus%20scoping%20consolidated.pdf>

8 https://cdn.who.int/media/docs/default-source/one-health/ohhlep/ohhlep-prevention-of-zoonotic-spillover.pdf?sfvrsn=652707eb_1&download=true

9 Nature for Health is a global initiative working nationally to prevent pandemics and related health risks by strengthening the environmental aspects of One Health. More information on this project is available here: <https://nature4health.org/about>

10 Social-ecological systems are interconnected systems of humans and nature, emphasising that humans must be seen as a part of nature and not as something separate from it.

-
- **Response** refers to the actions that can limit the consequences on health and on other areas such as economics, and the spread of an already-traced disease. Their effectiveness hinges on the level of preparedness and on the capacity and willingness to develop joint risk assessment tools encompassing all sectors and implement interventions in a timely manner.
 - **Preparedness** requires proactive measures to ensure swift action when a threat is detected. Oppenheim et al (2019) propose a framework to assess the level of preparedness including indicators on public health and physical infrastructure, economic resources, and resources for public health education and communication. Preparedness and response strategies aimed at controlling the source of non-communicable diseases in the environment require acting on existing sources of contamination to limit their spread, but also reclamation of contaminated land and/or water. Sources of pollution and contamination not only constitute direct hazards, but they also weaken humans' immune system: addressing potential sources and treating already contaminated areas should therefore be a priority. Urban planning has an important role to play in this regard especially as many former industrial areas are now integral part of cities. From a One Health approach perspective, these areas must be considered as opportunities for urban regeneration to create new spaces capable of promoting public health (i.e. urban green spaces, pedestrian areas, public services, cycle paths, etc.) and making cities healthier.

Considering the determinants of health of individuals and populations, both in the European conceptual model of interconnections and in the American one, social and environmental aspects play a very important role in terms of health promotion and prevention. In particular, as the American model highlights, 50% of the risk factors are related to socio-economic factors and lifestyle, 20% to environmental conditions, 20% to genetic inheritance and 10% to healthcare services (Dahlgreen & Whitehead, 1993). Given this, One Health action in an urban setting rests on three pillars (Capolongo et al, 2020):

- reduction of environmental risk factors (e.g. effects of climate change, pollution, waste, inequalities and social inclusion)
- analysis of health outcomes (e.g. non-communicable diseases, mental health disorders, accidents)
- promotion of urban health strategies (e.g. urban green spaces and biodiversity protection, water management and blue spaces, urban mobility, social mix and functional mix, urban solid waste management, sustainability and resilience of buildings, monitoring of project impacts).

Good practices have already shown significant positive outcomes. For example, Barcelona's 'superblock' model converted public spaces that were previously used by motor vehicles into green and community areas. The Barcelona Institute for Global Health, ISGlobal, measured the resulting improvements in environmental health determinants, notably in term of reduced air and acoustic pollution (Mueller et al, 2019). There are other similar success stories which highlight the effective collaboration between research institutions, public administrations and citizens, such as the Safely Connected project¹¹ financed by the call EIT Crisis Response Initiative. In this project, a new pedestrian area was created in the city centre, aimed at relaunching community-based economic and social activities in Saint Germain-

¹¹ <https://eit.europa.eu/our-activities/covid-19-response/solutions/safely-connected>

en-Laye in France. The range of actions and interventions that can be considered for cities is extensive and must be integrated with other initiatives aimed at sustainability, climate change mitigation and adaptation. To this effect, UN Habitat and the WHO (2020)¹² have produced a Handbook to mainstream health in urban planning.

To address the determinants of health, a Tool for Urban Plans¹³ has been proposed and applied in a project funded by the Centre for Disease Control in Italy in 2017 (see Buffoli et al, 2022). The Tool provides indicators in seven macro-areas, with the first focusing on prerequisites, and the remaining six serving as an assessment tool for the following areas (Progetto CCM, 2017):

- environment
- soil and subsoil
- sustainability and hygiene of the built environment
- urban and social development
- mobility and transport
- outdoor spaces

The One Health approach requires that any mitigation or adaptation strategy against climate change be carefully designed. For example, the greening of cities is recognised as an essential component of both climate change mitigation and adaptation forming part of nature-based solutions. Given that larger green spaces featuring certain type of vegetation may attract more pathogens vectors (Ligsay, et al, 2021), urban greening needs to be implemented carefully, taking into account a comprehensive set of variables and the intricate interactions between different systems often referred to as the nexus.

About the costs and benefits of the One Health approach

One Health approaches appear to be most effective and sustainable in prevention, preparedness, early detection and analysis of evolving risks and hazards. Their track record is particularly good in controlling endemic and neglected tropical diseases. The profitability of the One Health approach can be demonstrated by drawing on mathematical models and economic analyses. A case study presented at the workshop showcased the mass vaccination of 25 million sheep, goats and cattle in Mongolia as a preventative measure against human brucellosis (Roth et al, 2003). An economic analysis solely considering the costs of the intervention and the payoff for public health suggested that this intervention was not financially viable. However, a more comprehensive evaluation that, in addition to the returns to public health took into account private health benefits, household income loss avoidance, and agricultural benefits, painted a very different picture: if the costs of vaccination of livestock against brucellosis were allocated to all sectors in proportion to the benefits, the intervention might have been profitable and cost effective for both agricultural and health sectors.

12 <https://unhabitat.org/the-new-urban-agenda-illustrated>

13 <https://www.ccm-network.it/pagina.jsp?id=node/2306>

Another case study looked at the gains of rabies control in dogs through mass vaccination in N'Djaména, Chad (Zinsstag et al, 2017; Mindekem et al, 2017). The results showed that canine rabies transmission to humans can be stopped where canine rabies vaccines are already available, provided that the area of vaccination encompasses large adjacent regions and that local communities are well informed and engaged in the endeavour.

Requirements for One Health operationalisation through shared governance

To maximise and extend the benefits listed in the previous section, the operationalisation of One Health needs to be improved by strengthening multisectoral coordination mechanisms at national, regional and global levels (Zinsstag, 2023).

Addressing the interlinkages between different aspects of One Health requires breaking down existing silos and barriers: this means involving a broader range of disciplines and understanding the economic implications of adopting, or not adopting, One Health principles. The success of transdisciplinary efforts hinges on the quality and the depth of partnerships within public administrations and with a wide range of actors, including workers and citizens. Transdisciplinary and multisectoral collaboration encompassing all relevant disciplines, modern and traditional forms of knowledge, and a broad representative range of perspectives, along with a commitment to fairness across sectors and disciplines, are two foundational principles of the One Health approach in the work of the One Health High-Level Panel.

It was pointed out at the workshop that effectively implementing the One Health approach across all institutional levels requires:

- establishing governance and legal frameworks that support One Health cooperation
- facilitating communication, coordination, and cooperation between stakeholders from different sectors
- supporting the change in the mindset of experts and decision-makers, encouraging them to look at and assess problems from a comprehensive One Health perspective

Data governance

Data governance is a key area where progress is needed at EU level. For example, the joint surveillance report on zoonoses produced by ECDC and EFSA (2022) provides data submitted through the different reporting systems of the two agencies, with an agreement at the supranational data integration

level between both agencies. While some maps reporting on zoonotic diseases developed by ECDC¹⁴ integrate data from different systems, there is still a notable absence of unified and shared data governance across the different Commission services and agencies involved in surveillance, prevention, preparedness and response to health threats. Workshop discussions noted that gathering and sharing data might be the most important step forward towards effective cross sectoral collaboration. Concerns were also raised about data collected through European projects that remain underutilised or lack follow-up after the end of the projects.

Training and education

As demonstrated by the One Health European Joint Programme, training and education has a key role to play in developing future professionals capable of embracing and effectively implementing One Health. In this regard, it was suggested at the workshop that the focus should not be limited to training medical doctors and veterinarians on One Health, but should also be extended to non-medical experts. Engineers, urban planners, environmental scientists can greatly benefit from gaining an in-depth understanding of how their work can contribute to One Health. Promising examples of this type of training for non-medical professionals are available at the Politecnico di Milano in Italy, with the Masters degree in urban design for Healthy Cities at the UIC in Barcelona, Spain, and at the Healthy City Lecture Series at Leiden University in the Netherlands.

Expanding the understanding of One Health: involving more actors in policy operationalisation

The need to frame the One Health concept and provide a clear and focused scope was stressed during the workshop since the broad scope entails significant coordination challenges. Experts concurred on the need for more research to demonstrate the incremental benefits of closer cooperation at a One Health level, particularly from an economic, but also from a social and environmental perspective. It is essential to demonstrate that One Health extends beyond human health but plays an increasingly pivotal role in enhancing animal welfare and improving environmental services.

The recognition of the inextricable linkages between human, livestock, companion animal and wildlife health and the environment are a necessary but not sufficient requirement to a One Health approach. Its success lies in its ability to deliver added value to both human and animal health and welfare and/or financial savings, social resilience and environmental sustainability resulting from the closer cooperation between human and animal health and other sectors. The social dimension of any measures and policies in a One Health context needed to be addressed and including equality, safe and healthy work and equal access to services. The needs of specific population groups (for instance,

¹⁴ The maps produced by the ECDC are available for consultation here: <https://www.ecdc.europa.eu/en/publications-data>

essential healthcare workers both in human and animal health, along with social services) must also be considered

At the implementation level, particular care must be given to developing comprehensive policy within member states. The success of these initiatives depends on the strength, inclusivity, and quality of partnerships which will determine the quality of the results. Trust, transparency in the allocation of responsibilities, and effective leadership are all key requirements for successful partnerships. Such an approach has important implications for society including through its impact on public services, the economic sector, and on workers.

There are obvious links between public health, veterinary, environmental or urban planning measures and occupational safety and health. Occupational health has a pivotal role on the operationalisation of the One Health approach. For instance, the 2020 EU-OSHA report *Review of the future of agriculture and occupational safety and health*¹⁵ offers interesting insights into future developments in the agricultural sector with an impact on occupation health and safety, including considerations on the spread of zoonoses and on climate change. Mindful that workers are expected to be at the forefront of any outbreaks of zoonoses, several joint interagency efforts have been carried out to provide worker-related information in guidance on countering zoonotic diseases such as the report *Testing and detection of zoonotic influenza virus infections in humans in the EU/EEA, and occupational safety and health measures for those exposed at work* (ECDC, 2022)¹⁶ jointly developed by ECDC, EU-OSHA, EFSA, and the European Reference Laboratory for Avian Influenza and Newcastle Disease.

Examples of joint One Health collaborations and initiatives in Europe at the level of agencies

One important aspect of cross-sectoral governance for One Health in the European Union consists in the need for increasingly integrated scientific advice, incorporating human, animal and ecosystem health dimensions. This also requires filling existing knowledge gaps, for example by expanding EU-level environmental monitoring of contaminants and pathogens. Policies such as *Strategic approach to pharmaceuticals in the environment* (European Commission, 2019), the EU soil strategy for 2023,¹⁷ and the zero pollution action plan¹⁸ (including its zero-pollution package with proposals for revised legislation on water and air) exemplify a proactive approach to environmental action aimed at preventing impacts on antimicrobial resistance and on both communicable and non-communicable diseases prevention.

15 <https://osha.europa.eu/en/publications/future-agriculture-and-forestry-implications-managing-worker-safety-and-health>

16 <https://osha.europa.eu/en/publications/testing-and-detection-zoonotic-influenza-virus-infections-humans-eeea-and-occupational-safety-and-health-measures-those-exposed-work>

17 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0699>

18 Information on the Zero pollution action plan is available for consultation here: https://environment.ec.europa.eu/strategy/zero-pollution-action-plan_en

In order to transition to more integrated scientific advice, strengthening collaboration between European agencies is critical. This collaboration is currently determined by the specific topic at hand as each agency operates within its defined mandate, role and responsibility. For example, ECDC and EFSA collaborate on zoonotic and food-borne events, which includes the production of joint surveillance reports, joint rapid outbreak assessments and joint projects; EMA and EEA collaborate through the Climate and Health Observatory and also engage with ECHA in areas of mutual interest such as biocides for vector control.

The Climate and Health Observatory is an initiative hosted in the Climate Adapt platform that is managed jointly by the European Commission and the EEA.¹⁹ As stated on their website, “the Observatory aims to become the authoritative source of actionable knowledge on the past, current and projected climate change risks to health at all life stages and in all settings, as well as on policies and actions addressing them”. It is a partnership with several organisations and covers the 38 EEA member states and cooperating countries.

Several initiatives have been launched to support the implementation of the flagship 1 of the zero-pollution action plan *Reducing health inequalities through zero pollution*, through collaborative efforts undertaken by various European Commission departments and agencies. In May 2023, the EEA launched the European Environment and Health Atlas,²⁰ which allows users to visualise how pollution and other environmental risks around them affect their health and wellbeing, and how environmental assets protect them. The atlas covers topics such as air quality, noise, water quality, green and blue spaces, and climate change, and highlights inequalities in the distribution of environmental risks to health across Europe. Another example of cross-sectoral collaboration is the European Cancer Inequalities Registry,²¹ managed by the European Commission and the Joint Research Centre, which among others integrates data on country-specific situation concerning the impact of environmental pollution on cancer.²²

However, there is a consensus that existing collaborations among the agencies should evolve towards a more established form of strategic and transdisciplinary collaboration, which aims to align scientific advice with the One Health approach. A paper on *One Health collaboration with and among EU agencies: Bridging research and policy* (Bronzwaer et al, 2022) by members of ECDC, ECHA, EEA, EFSA, EMA, European Commission, European Parliament and OHEJP, underlined the need for such transdisciplinary cooperation, identified challenges and provided recommendations for improving collaboration. Among the challenges highlighted by the paper is the divergence in mandates of different European agencies. If joint work must be carried out for One Health, time and resources need to be committed specifically for this. The fragmentation of information and the gap between theory and actual implementation pose significant barriers to the effective and timely provision of integrated scientific knowledge essential for policy makers to adopt a One Health perspective. For One Health to become

19 <https://climate-adapt.eea.europa.eu/en/observatory/About/about-the-observatory/>

20 <https://discomap.eea.europa.eu/atlas/?page=Home>

21 <https://cancer-inequalities.jrc.ec.europa.eu/>

22 <https://cancer-inequalities.jrc.ec.europa.eu/environmental-indicators>

operational and effective, changes are needed to the current legislation and regulatory frameworks which are often vertical in nature, resulting in isolated risk and task management. For example, activities related to human health, animal husbandry and ecosystems are often fragmented at both EU and member state level. To respond to these challenges, a cross-agency task force on One Health, involving ECDC, ECHA, EFSA, EEA and EMA, was recently created. The task force also identified a series of priority work areas to strengthen cross-agency collaboration, including strategic direction and policy support, research coordination, stakeholder engagement and joint procurement and activities.

Annexes

Bibliography

- Allen, T., Murray, K. A., Zambrana-Torrel, C., Morse, S. S., Rondinini, C., Di Marco, M. & Daszak, P. (2017). Global hotspots and correlates of emerging zoonotic diseases. *Nature communications*, 8(1), 1124. doi:10.1038/s41467-017-00923-8
- Barton Behravesh C. (2019). Introduction. *One Health: over a decade of progress on the road to sustainability. Revue scientifique et technique (International Office of Epizootics)*, 38(1), 21–50. doi: 10.20506/rst.38.1.2939
- Bronzwaer, S., Catchpole, M., de Coen, W., Dingwall, Z., Fabbri, K., Foltz, C., Ganzleben, C., van Gorcom, R., Humphreys, A., Jokelainen, P., Liebana, E., Rizzi, V., & Url, B. (2022). One Health collaboration with and among EU Agencies - Bridging research and policy. *One health (Amsterdam, Netherlands)*, 15, 100464. doi: 10.1016/j.onehlt.2022.100464
- Capolongo, S., Buffoli, M., Brambilla, A., & Rebecchi, A. (2020). Strategie urbane di pianificazione e progettazione in salute, per migliorare la qualità e l'attrattività dei luoghi.[Healthy urban planning and design strategies to improve urban quality and attractiveness of places.]. *Techne*, 19, 271-279. hdl: 11311/1141482
- Carlson, C. J., Albery, G. F., Merow, C., Trisos, C. H., Zipfel, C. M., Eskew, E. A., Olival, K. J., Ross, N., & Bansal, S. (2022). Climate change increases cross-species viral transmission risk. *Nature*, 607(7919), 555–562. doi: 10.1038/s41586-022-04788-w
- Crump, L., Martinoli, D., & Zinsstag, J. (2021). Links between biodiversity and human infectious and non-communicable diseases: a review. *Swiss medical weekly*, 151, w20485. doi: 10.4414/smw.2021.20485
- Dahlgren, G. and Whitehead, M. (1993) Tackling inequalities in health: what can we learn from what has been tried? Working paper prepared for the King's Fund International Seminar on Tackling Inequalities in Health, September 1993, Ditchley Park, Oxfordshire. London, King's Fund. In Dahlgren, G. and Whitehead, M. (2007). Editors. *European Strategies for Tackling Social Inequities in Health: Levelling Up Part 2*. Copenhagen: WHO Regional Office for Europe; pp. 20 to 3
- Donovan, G. H., Gatzliolis, D., Longley, I., & Douwes, J. (2018). Vegetation diversity protects against childhood asthma: results from a large New Zealand birth cohort. *Nature plants*, 4(6), 358–364. doi: 10.1038/s41477-018-0151-8
- ECDC- European Centre for Disease Prevention and Control (2022) Testing and detection of zoonotic influenza virus infections in humans in the EU/EEA, and occupational safety and health measures for those exposed at work. Stockholm: ECDC. https://www.ecdc.europa.eu/sites/default/files/documents/zoonotic-influenza-virus-infections-testing-detection_0.pdf
- ECDC & EFSA- European Centre for Disease Prevention and Control, European Food Safety Authority and European Medicines Agency (2021). Antimicrobial consumption and resistance in bacteria from humans and animals. <https://www.ecdc.europa.eu/sites/default/files/documents/JIACRA-III-Antimicrobial-Consumption-and-Resistance-in-Bacteria-from-Humans-and-Animals.pdf>
- EU-OSHA- European Agency for Safety and Health at Work (2020) Review of the future of agriculture and occupational safety and health (OSH)- Foresight on new and emerging risks in OSH. European Risk Observatory Report. https://osha.europa.eu/sites/default/files/Review_%20future_Agriculture_OSH.pdf
- European Commission (2019). Strategic approach to pharmaceuticals in the environment. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0128&qid=1605854880622>
- European Environment Agency (2023). The benefits to biodiversity of a strong circular economy. <https://www.eea.europa.eu/publications/the-benefits-to-biodiversity/the-benefits-to-biodiversity-of>
- European Food Safety Authority and European Centre for Disease Prevention and Control (2022). The European Union One Health 2021 Zoonoses Report. *EFSA Journal* 2022; 20(12):7666, 273. doi: 10.2903/j.efsa.2022.7666
- Elnaiem, A., Mohamed-Ahmed, O., Zumla, A., Mecaskey, J., Charron, N., Abakar, M. F., Raji, T., Bahalim, A., Manikam, L., Risk, O., Okereke, E., Squires, N., Nkengasong, J., Rüegg, S. R., Abdel Hamid, M. M., Osman, A. Y., Kapata, N., Alders, R., Heymann, D. L., Kock, R., Dar, O. (2023). Global and regional governance of One Health and implications for global health security. *Lancet (London, England)*, 401(10377), 688–704. doi: 10.1016/S0140-6736(22)01597-5
- Intergovernmental Panel on Climate Change (2021). Sixth Assessment Report (AR6). https://report.ipcc.ch/ar6/wg1/IPCC_AR6_WGI_FullReport.pdf
- IUFRO (2023). Forests and trees for human health: Pathways, impacts, challenges and response options. World Series Volume 41. Vienna. 232. <https://www.iufro.org/news/article/2023/03/21/world-series-vol-41-forests-and-trees-for-human-health-pathways-impacts-challenges-and-responses/>

- Lerner, H. & Berg, C. (2015). The concept of health in One Health and some practical implications for research and education: what is One Health?. *Infection ecology & epidemiology*, 5, 25300 doi: 10.3402/iee.v5.25300
- Ligsay A., Telle O., Paul R. (2021) Challenges to Mitigating the Urban Health Burden of Mosquito-Borne Diseases in the Face of Climate Change. *Int J Environ Res Public Health*. May 10;18(9) doi: 10.3390/ijerph18095035
- Marani, M., Katul, G. G., Pan, W. K., & Parolari, A. J. (2021). Intensity and frequency of extreme novel epidemics. *Proceedings of the National Academy of Sciences of the United States of America*, 118(35), e2105482118. doi: 10.1073/pnas.2105482118
- Mindekem, R., Lechenne, M. S., Naissengar, K. S., Oussiguéré, A., Kebkiba, B., Moto, D. D., Alfaroukh, I. O., Ouedraogo, L. T., Salifou, S., & Zinsstag, J. (2017). Cost Description and Comparative Cost Efficiency of Post-Exposure Prophylaxis and Canine Mass Vaccination against Rabies in N'Djamena, Chad. *Frontiers in veterinary science*, 4, 38. doi: 10.3389/fvets.2017.00038
- Morand S. & Lajaunie C. (2018). Loss of Biological Diversity and Emergence of Infectious Diseases. *Biodiversity and Health*, 29-47. doi.org: 10.1016/B978-1-78548-115-4.50003-2
- Mueller N., Rojas-Rueda D., Khreis H., Cirach M., Andrés D., Ballester J., Bartoll X., Daher C., Deluca A., Echave C., Milà C., Márquez S., Palou J., Pérez K., Tonne C., Stevenson M., Rueda S., Nieuwenhuijsen M. (2019) Changing the urban design of cities for health: The superblock model. *Environ Int*. 2020 Jan;134:105132. doi: 10.1016/j.envint.2019.105132
- 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. doi: 10.1371/journal.ppat.1010537
- Oppenheim, B., Gallivan, M., Madhav, N. K., Brown, N., Serhiyenko, V., Wolfe, N. D., & Ayscue, P. (2019). Assessing global preparedness for the next pandemic: development and application of an Epidemic Preparedness Index. *BMJ global health*, 4(1), e001157.
- Patz, J. A. & Hahn, M. B. (2013). Climate change and human health: a One Health approach. *Current topics in microbiology and immunology*, 366, 141–171. doi: 10.1007/82_2012_274
- Progetto CCM – 2017, “Urban Health: buone pratiche per la valutazione di impatto sulla salute degli interventi di riqualificazione e rigenerazione urbana e ambientale”. https://www.ccm-network.it/imgs/C_27_MAIN_progetto_550_1_file.pdf
- Ratnadass, Al. & Deguine, J. P. (June 2021). Crop protection practices and viral zoonotic risks within a One Health framework. *Science of the Total Environment*. 774: 145172. Doi: 10.1016/j.scitotenv.2021.145172
- Roth, F., Zinsstag, J., Orkhon, D., Chimed-Ochir, G., Hutton, G., Cosivi, O., Carrin, G., & Otte, J. (2003). Human health benefits from livestock vaccination for brucellosis: case study. *Bulletin of the World Health Organization*, 81(12), 867–876. PMID: 14997239
- Sinclair J. R. (2019). Importance of a One Health approach in advancing global health security and the Sustainable Development Goals. *Revue scientifique et technique (International Office of Epizootics)*, 38(1), 145–154. doi: 10.20506/rst.38.1.2949
- Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M. and de Haan, C. (2006) *Livestock's Long Shadow: Environmental Issues and Options*. Food and Agriculture Organization of the United Nations (FAO), Rome. <https://www.fao.org/3/a0701e/a0701e.pdf>
- UNESCO Biosphere Reserves (2020). Supporting Biocultural Diversity, Sustainability and Society report. <https://unesdoc.unesco.org/ark:/48223/pf0000384367>
- United Nations (2022). 2022 Revision of World Population Prospects. <https://population.un.org/wpp/>
- UN Habitat and WHO (2020). Integrating health in urban and territorial planning: a sourcebook. Geneva: UN-HABITAT and World Health Organization. <https://www.who.int/publications/i/item/9789240003170>
- Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Beagley, J., Belesova, K., Boykoff, M., Byass, P., Cai, W., Campbell-Lendrum, D., Capstick, S., Chambers, J., Coleman, S., Dalin, C., Daly, M., Dasandi, N., Dasgupta, S., Davies, M., Napoli, C. D., ... Costello, A. (2021). The 2020 report of The Lancet Countdown on health and climate change: Responding to converging crises. *The Lancet*, 397(10269), 129–170. doi: 10.1016/S0140-6736(20)32290-X
- WHO- World Health Organization. Regional Office for Europe (2022) . A health perspective on the role of the environment in One Health. World Health Organization. Regional Office for Europe. <https://apps.who.int/iris/handle/10665/354574>
- Zinsstag, J., Lechenne, M., Laager, M., Mindekem, R., Naissengar, S., Oussiguéré, A., Bidjeh, K., Rives, G., Tessier, J., Madjaninan, S., Ouagal, M., Moto, D. D., Alfaroukh, I. O., Muthiani, Y., Traoré, A., Hattendorf, J., Lepelletier, A., Kergoat, L., Bourhy, H., Dacheux, L., Chitnis, N. (2017). Vaccination of dogs in an African city interrupts rabies transmission and reduces human exposure. *Science translational medicine*, 9(421), eaaf6984. doi: 10.1126/scitranslmed.aaf6984
- Zinsstag J, Kaiser-Grolimund A, Heitz-Tokpa K, Sreedharan R, Lubroth J, Caya F, Stone M, Brown H, Bonfoh B, Dobell E, Morgan D, Homaira N, Kock R, Hattendorf J, Crump L, Mauti S, Del Rio Vilas V, Saikat S, Zumla A, Heymann D, Dar O, de la Rocque S. (2023). Advancing One human-animal-environment Health for global health security: what does the evidence say?. *Lancet* 401(10376):591-604. doi: 10.1016/S0140-6736(22)01595-1
- Zinsstag, J., Utzinger, J., Probst-Hensch, N., Shan, L., & Zhou, X. N. (2020). Towards integrated surveillance-response systems for the prevention of future pandemics. *Infectious diseases of poverty*, 9(1), 140. doi: 10.1186/s40249-020-00757-5

Further bibliography

- Akhtar A. (2013). The need to include animal protection in public health policies. *Journal of public health policy*, 34(4), 549–559. doi: 10.1057/jphp.2013.29
- Allel, K., Day, L., Hamilton, A., Lin, L., Furuya-Kanamori, L., Moore, C. E., Van Boeckel, T., Laxminarayan, R., & Yakob, L. (2023). Global antimicrobial-resistance drivers: an ecological country-level study at the human-animal interface. *The Lancet. Planetary health*, 7(4), e291–e303. doi: 10.1016/S2542-5196(23)00026-8
- Angelou A., Kioutsoukis 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. doi: 10.1016/j.onehlt.2021.100330
- Berkes, F. and Folke, C. (1998). Linking Social and Ecological Systems for Resilience and Sustainability. In: Berkes, F., Folke, C. and Colding, J., Eds., *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*, Cambridge University Press, New York, p. 27. doi: 10.5751/ES-00202-040205
- Buffoli M., Vilella F., Voynov N.S., Rebecchi A. (2022). Urban Green Space to Promote Urban Public Health: Green Areas' Design Features and Accessibility Assessment in Milano City, Italy. hdl: 11311/1231601
- European Parliament (2023). Report on the COVID-19 pandemic: lessons learned and recommendations for the future. Available for consultation here: https://www.europarl.europa.eu/doceo/document/COVI-PR-739788_EN.pdf (Amendments 1338 and 1344 point to the need to have a One Health approach as the guiding principle of all public policy initiatives and call for a cross-agency One Health task force to advance transdisciplinary research and cross-sectoral scientific advice.)
- Gianfredi, V., Buffoli, M., Rebecchi, A., Croci, R., Oradini-Alacreu, A., Stirparo, G., Marino, A., Odone, A., Capolongo, S., & Signorelli, C. (2021). Association between Urban Greenspace and Health: A Systematic Review of Literature. *International journal of environmental research and public health*, 18(10), 5137. doi: 10.3390/ijerph18105137
- Humboldt-Dachroeden S. (2022). A governance and coordination perspective - Sweden's and Italy's approaches to implementing One Health. *SSM - Qualitative Research in Health*, Volume 2 doi: 10.1016/j.ssmqr.2022.100198
- Kengne K., L. S., Voordouw, A. C. G., de Vries, M. C., Belfroid, E., Koopmans, M., & Timen, A. (2022). Identifying the sectors involved in the European public health emergency preparedness and response: a systematic review. *BMJ open*, 12(11), e062624. doi: 10.1136/bmjopen-2022-062624
- Lederman, Z., Magalhães-Sant'Ana, M., & Voo, T. C. (2021). Stamping Out Animal Culling: From Anthropocentrism to One Health Ethics. *Journal of agricultural & environmental ethics*, 34(5), 27. doi: 10.1007/s10806-021-09868-x
- Mackenzie, J. S., & Jeggo, M. (2019). The One Health Approach-Why Is It So Important?. *Tropical medicine and infectious disease*, 4(2), 88. doi: 10.3390/tropicalmed4020088
- Markotter, W., Mettenleiter, T.C., Adisasmito, W.B., Almuhairi, S., Barton Behravesh, C., Bilivogui, P., Bukachi, S.A., Casas, N., Cediel Becerra, N., Charron, D.F., Chaudhary, A., Ciacci Zanella, J.R., Cunningham, A., Dar, O., Debnath, N., Dungu, B., Farag, E., Gao, G.F., Hayman, D.T.S., Khaita, M., Koopmans M., Machalaba, C., Mackenzie, J., Morand, S., Smolenskiy, V., Zhou, L. (2023). Prevention of zoonotic spillover: From relying on response to reducing the risk at source. *PLoS pathogens*, 19(10), e1011504. doi: 10.1371/journal.ppat.1011504
- Morand, S., Jittapalpong, S., Suputtamongkol, Y., Abdullah, M. T., & Huan, T. B. (2014). Infectious diseases and their outbreaks in Asia-Pacific: biodiversity and its regulation loss matter. *PLoS one*, 9(2), e90032. doi: 10.1371/journal.pone.0090032
- Muylaert, R. L., Kingston, T., Luo, J., Vancine, M. H., Galli, N., Carlson, C. J., John, R. S., Rulli, M. C., & Hayman, D. T. S. (2022). Present and future distribution of bat hosts of sarbecoviruses: implications for conservation and public health. *Proceedings. Biological sciences*, 289(1975), 20220397. doi: 10.1098/rspb.2022.0397
- Official Journal of the European Union. Regulation (EU) 2022/2371 on serious cross-border threats to health and repealing Decision No 1082/2013/EU. Available for consultation here: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R2371> (Articles 5, 11 and 20 include references on One Health).
- Paternoster, G., Babo Martins, S., Mattivi, A., Cagarelli, R., Angelini, P., Bellini, R., Santi, A., Galletti, G., Pupella, S., Marano, G., Copello, F., Rushton, J., Stärk, K. D. C., & Tamba, M. (2017). Economics of One Health: Costs and benefits of integrated West Nile virus surveillance in Emilia-Romagna. *PLoS one*, 12(11), e0188156. doi: 10.1371/journal.pone.0188156
- Rebecchi A., Buffoli M., Dettori M. Appoloni L., Azara A., Castiglia P. D'Allessandro, D., Capalongo, S. (2019). Walkable Environments and Healthy Urban Moves: Urban Context Features Assessment Framework Experienced in Milan. *Sustainability* 11, no. 10: 2778. doi: 10.3390/su11102778
- Smith, M., Hosking, J., Woodward, A., Witten, K., MacMillan, A., Field, A., Baas, P., & Mackie, H. (2017). Systematic literature review of built environment effects on physical activity and active transport - an update and new findings on health equity. *The international journal of behavioral nutrition and physical activity*, 14(1), 158. doi: 10.1186/s12966-017-0613-9

Swanson, D., Koren, C., Hopp, P., Jonsson, M.E., Rø, G. I., White, R. A., Grøneng, G. M. (2022). A One Health real-time surveillance system for nowcasting *Campylobacter* gastrointestinal illness outbreaks, Norway, week 30 2010 to week 11 2022. *Euro Surveillance*. 27(43): 2101121. Available for consultation at: <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2022.27.43.2101121>

Westenhöfer, J., Nouri, E., Reschke, M. L., Seebach, F., & Buchcik, J. (2023). Walkability and urban built environments—a systematic review of health impact assessments (HIA). *BMC public health*, 23(1), 518. doi: 10.1186/s12889-023-15394-4

Zinsstag, J., Kaiser-Grolimund, A., Heitz-Tokpa, K., Sreedharan, R., Lubroth, J., Caya, F., Stone, M., Brown, H., Bonfoh, B., Dobell, E., Morgan, D., Homaira, N., Kock, R., Hattendorf, J., Crump, L., Mauti, S., Del Rio Vilas, V., Saikat, S., Zumla, A., Heymann, D., de la Rocque, S. (2023). Advancing One human-animal-environment Health for global health security: what does the evidence say?. *Lancet* (London, England), 401(10376), 591–604. doi: 10.1016/S0140-6736(22)01595-1

List of participants and other attendees

Experts / speakers

- Marion Koopmans, Erasmus MC Rotterdam
- Thomas C Mettenleiter, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health
- Serge Morand, French National Centre for Scientific Research (CNRS)
- Maddalena Buffoli, Politecnico di Milano
- Hein Imberechts, Scientific Coordinator of the One Health EJP
- Jakob Zinsstag, University of Basel and Swiss Tropical and Public Health Institute
- Roser Domenech Amado, DG SANTE
- Tamas Bakonyi, ECDC
- Dario Piselli, EEA
- Stef Bronzwaer, EFSA

Other attendees

- Nicole Grobert, Chair of the Group of Chief Scientific Advisors
- Ingrid Zegers, DG RTD
- Jean Charles Cavitte, DG AGRI
- Massimiliano Mascherini, EUROFOUND
- Xavier Pavard, DG INTP
- Peter Loffler, DG CLIMA
- Elke Schneider, OSHA
- Helen Clayton, DG ENV
- Jean Baptiste Perrin, DG HERA
- Nikolaos Stilianakis, JRC
- Dolores Ibarreta, JRC
- Altieri Andrea, ECHA
- Eric Lambin, Member of the Group of Chief Scientific Advisors
- Eva Zazimalova, Member of the Group of Chief Scientific Advisors
- Janusz Bujnicki, former Member of the Group of Chief Scientific Advisors
- Julien Gaffuri, Eurostat
- Kritof Bonnarens, DG SANTE
- Leonard Engels, DG RTD
- Lorena Korosec, DG ENV
- Luigi Spagnolo, JRC
- Nicola Magnani, DG RTD
- Nebojsa Nakicenovic, Deputy Chair of the Group of Chief Scientific Advisors
- Ole Heuer, ECDC
- Olimpia Imperiali, DG ECHO
- Pearl Dykstra, former Member of the Group of Chief Scientific Advisors
- Scira Menoni, DG RTD
- Thomas Van Cangh, DG SANTE
- Mery Ciacci, DG ENV
- Agnieszka Friedrichs, DG RTD
- Alice Pignacca, DG SANTE
- Frederico Alves, EFSA
- Ana Vidal, EMA
- Carina Keskitalo, former Member of the Group of Chief Scientific Advisors
- Cristian Fetic, DG ESTAT (Eurostat)
- Ferry C. Breedveld, FEAM Vice President
- Arnaud Callegari, Coordinator of the One Health EJP
- Rudolf Hielscher, SAPEA Coordinator
- Alison Weightman, Cardiff University
- Stephany Mazon, SAPEA Scientific Policy Officer
- Louise Edwards, SAPEA Scientific Policy Officer
- Marie Jo A. Cortijo, Scientific writer
- Céline Tschirhart, SAPEA Scientific Policy Officer
- Rafael Marzo, SAPEA Scientific Policy Officer
- Rúben Castro, SAPEA Scientific Policy Officer

Programme

Chaired by Nicole Grobert, chair of the Group of Chief Scientific Advisors

10:00	Welcome and introduction (Ferry C. Breedveld, FEAM Vice President) Introduction to the Scientific Advice Mechanism (Ingrid Zegers, DG RTD) The scoping questions framing the request to the Advisors (Nicole Grobert)
Models of cross-sectoral governance for One Health	
10:10	The One Health Directorate in DG SANTE: mandates and mission (Roser Domenech Amado, DG SANTE)
10:20	Cross-governance aspects of One Health (Marion Koopmans, Erasmus MC Rotterdam)
10:30	The needed systemic understanding of One Health (Tamas Bakonyi, ECDC)
10:40	Operationalising the definition of One Health (Thomas C Mettenleiter, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Germany)
10:50	Discussion Jean Charles Cavitte, DG AGRI Massimiliano Mascherini, EUROFOUND Xavier Pavard, DG INTPA Open discussion and questions
11:05	Break
Multiple dimensions of One Health	
11:20	The environmental dimension of One Health (Serge Morand, French National Centre for Scientific Research)
11:30	The urban environment as determinant of One Health (Maddalena Buffoli, Politecnico di Milano)
11:40	Cases of One Health approaches integrating the environmental dimension (Dario Piselli, EEA)
11:50	Discussion Peter Loffler, DG CLIMA Elke Schneider, OSHA Helen Clayton, DG ENV Open discussion and questions
Transdisciplinary approaches and criteria to measure progress towards One Health	
12:05	The One Health Integrative Strategic Matrix: the One Health EJP approach to share data across partners and sectors to enhance preparedness for foodborne zoonoses and antimicrobial resistance outbreaks (Hein Imberechts, Scientific Coordinator of the One Health EJP, Belgium)
12:25	Transdisciplinary interagency cooperation (Stef Bronzwaer, EFSA)
12:35	Measuring the added value of One Health (Jakob Zinsstag, University of Basel)
12:45	Discussion Jean-Baptiste Perrin, DG HERA Nikolaos Stilianakis, JRC Open discussion
13:00	Wrap-up and end (Roser Domenech Amado, DG SANTE)



scientificadvice.eu
[@EUScienceAdvice](#)

Contact us
EC-SAM@ec.europa.eu

Within the Scientific Advice Mechanism, SAPEA is funded by the European Union.
The activities of associated partners Academia Europaea and Cardiff University
are funded by UKRI (grant number 10033786).