

Research agenda of the One Health Platform

adopted by the Scientific Advisory Boards (SAB) on February 5, 2025

The research agenda of the One Health Platform (OHP) provides a substantive framework for the research activities that are currently to be funded by the Federal Ministry of Education and Research (BMBF), the Federal Ministry of Food and Agriculture (BMEL), Federal Ministry of Health (BMG), the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), the Federal Ministry of Defence (BMVg) and the Federal Ministry for Economic Cooperation and Development (BMZ) under the umbrella of the OHP. It builds on the research agenda of the German Research Platform for Zoonoses, which was first adopted in 2011.

"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 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 clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development."¹

OHP's mission is to support the implementation of the One Health approach in research and to promote inter- and transdisciplinary research activities in order to contribute to the improvement of human, animal and environmental health as well as to the sustainability goals of Germany and the United Nations. Human-induced changes such as increasing livestock densities, land-use changes, pollution, biodiversity loss, climate change, environmental adaptation measures and reduced soil fertility are interrelated, lead to unstable environmental conditions and can increase the risk of the emergence and spread of communicable and non-communicable diseases. The aim is therefore to enable an even faster, more effective and more targeted response to changing research issues in the One Health area.

OHP's activities centre on One Health issues relevant to human, animal and environmental health. In particular, the interfaces between these sectors in the sense of bringing together expertise from research and practice to build a One Health research community are addressed. This includes communicable and non-communicable diseases, antimicrobial resistance (AMR) and their links to climate change, environmental adaptation measures, the environment, biodiversity and human behaviour. Within this thematic framework, the OHP strives for a science-driven and demand-orientated inclusion of further thematic priorities, such as

¹ One Health definition of the One Health High Level Expert Panel (OHHLEP), a joint advisory body of the Food and Agriculture Organisation of the United Nations (FAO), World Organisation for Animal Health (WOAH), World Health Organisation (WHO) and the United Nations Environment Programme (UNEP) (2021).

environmental health protection. **This research agenda is continuously developed by the SAB**

In terms of the further development of OHP, the aim is to achieve closer integration of the various disciplines of (human and veterinary) medical research with public health, climate, biodiversity and environmental research, also at an international level. This should, for example, lead to a better understanding of the connection between environmental pollution or environmental changes, land use concepts, farm animals, biodiversity changes and climate change and the health of animals and humans. As social, economic, cultural, ethical and political influences also play a role here, the aim is to integrate other scientific disciplines, such as the social sciences and humanities, into OHP. The aim is to consistently think about the environment and health together and to generate interdisciplinary and transdisciplinary results that lead to improved human, animal and environmental health.

Project funding can be provided in two project formats, as 1) pilot projects or 2) interdisciplinary and/or transdisciplinary networking project. Project type 2) is to be implemented as a joint project with at least two scientific partners at different locations and from different sectors. Project applications should be orientated towards the research topics identified in the research agenda as well as the methodological and structural aspects. Applications can be submitted by researchers at all career levels. Project funding can be seen as start-up funding for new interdisciplinary and/or transdisciplinary research ideas in order to create the basis for follow-up funding.

In accordance with the strategy outlined above, the following **research topics** will be addressed first:

a) Research topics

I. Influence of environmental and climate change as well as socio-economic processes on the emergence, spread and characteristics of diseases, reservoirs, vectors and antibiotic resistance

The health of humans and animals and therefore the occurrence of communicable and non-communicable diseases depends crucially on intact ecosystems, the exact interactions of which are not yet known in detail. The emergence and spread of known, new and novel zoonotic pathogens as well as changes in the habitats and reservoirs for these known and as yet unknown pathogens pose new challenges for research.

Another area of research is the impact of climate and other environmental changes (e.g. land use, biodiversity/loss of biodiversity, pollution and nutrient loads) on the health of animals and humans - both with regard to transmissible and non-communicable diseases. The transmission of pathogens between different hosts and changes in the characteristics of antimicrobial resistance are influenced by a variety of factors (environment, climate, reservoir species, vectors and the pathogens themselves). It is therefore important to closely examine the occurrence and associated factors of pathogen reservoirs, vectors and infection chains of environmentally associated animal and human pathogenic diseases and antibiotic resistance. This also includes the resulting (new) health risks and associated aspects of environmental health protection.

The question of which diseases, pathogens, resistances, hosts and reservoirs play a role on a global level and which environmental and climate changes as well as socio-economic processes are associated with this is also of great importance with regard to the social and economic effects. There is also the question of which types of behaviour are particularly risky and which factors are responsible for them. When planning and analysing such studies, attention must be paid to the inclusion of epidemiology as a cross-sectional discipline.

II. development of innovative predictive, diagnostic, immunological and therapeutic methods at the human-animal-environment interface, as well as research into contextual cultural and socio-economic factors

A deeper understanding of the abiotic and biotic factors influencing the development of infectious and non-infectious diseases and the emergence and spread of new or novel pathogens and their transmission routes between the environment, wild animals, farm animals and humans is important in order to understand the influence of anthropogenic disturbances on health-related processes

Knowledge of the molecular mechanisms of host-pathogen interaction is also essential for research into host factors and environmentally associated animal and human pathogens in order to develop or improve diagnostic markers. These form the basis for the detection and characterisation of (new) pathogens and resistances, as well as the tracking of infection

processes in individual hosts or populations. Knowledge of the interaction between pathogen and host also forms the basis for the development of therapeutic strategies. Knowledge of the mechanisms of the development of non-infectious diseases is also required in order to understand the interactions between health-promoting and harmful environmental influences, infectious agents and human susceptibility factors.

Research into the factors associated with pathogens, the ecological niche that determines the virulence and pathogenicity of a pathogen and the effects of chemicals and physical environmental influences such as noise or heat on humans is a prerequisite for understanding environmentally mediated health risks and resources and for developing predictive models. These are essential for the risk assessment of transmissible infectious agents and antibiotic resistance in the One Health context.

To ensure the acceptance and effectiveness of preventive and therapeutic measures against communicable and non-communicable diseases in society, an understanding of the contextual cultural and socio-economic factors is crucial. It enables the design of targeted interventions adapted to the needs and realities of the affected communities and contributes to the promotion of successful prevention strategies and holistic health care between the human-animal-environment sectors.

b) methodological and structural aspects

I. Systematic data pooling, networking and evaluation: One Health data management

The collection and consolidation of epidemiological data on the spread of diseases and infectious agents in the One Health context and of data on the characterisation of antibiotic resistance, virulence, pathogenicity and host-pathogen interaction as well as environmental data enables the identification of risk factors.

Resources from the responsible authorities (public health services/veterinary services/environmental agencies), clinics and research, which enable meaningful data networking and systematic evaluation in compliance with legal data protection regulations, form the basis for transdisciplinary cooperation, an understanding of complex interrelationships and solid modelling and its validation. This is an important prerequisite for qualified forecasting and risk assessment.

Based on the results of data modelling and risk assessments (e.g. using artificial intelligence), preventive measures can be taken to protect humans, animals and the environment.

II. Networking between scientific institutions and authorities at all levels

Close and equal networking between scientific institutions and competent authorities (public health services/veterinary services/environmental authorities) is essential in order to utilise

research results for the protection of public health, as well as for the well-being of the environment and animals. This networking promotes both the early translation research results and the identification of research questions that arise in the day-to-day work of public health, veterinary and environmental authorities. A strong network between research and the authorities responsible at municipal and state level is therefore the subject of funding in addition to networking between research institutions and between the authorities.

Where relevant (e.g. environmental quality standards, chemicals policy, One Health networks), links should also be established with European and global players. Active utilisation of cooperation between these levels and the promotion of exchange between research and application should therefore be sought on the basis of specific projects.

III. Networking with stakeholders in society (e.g. citizen science)

Presenting research results transparently and transferring them into practice is an important basic prerequisite for anchoring the One Health approach in the long term not only among experts, but also among the general public, increasing awareness of the topic and achieving acceptance of any necessary intervention measures to reduce environmentally-related diseases.

The aim is therefore to involve relevant stakeholders in society and to include other disciplines that are relevant in this context, such as the humanities and social sciences. Attention must be paid to the varying accessibility of different population groups and their specific vulnerability, e.g. due to social inequalities, in line with the One Health concept. The early involvement of stakeholders from society in research processes is also supported.