

## Research agenda of the One Health Platform

**adopted at the meeting of the Scientific Advisory Board on 23 January 2024**

The research agenda of the One Health Platform (OHP) is a further development of the research agenda of the National Research Platform for Zoonoses, which was first adopted by the Internal Advisory Board of the Zoonoses Platform in 2011. It 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), the 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 One Health Platform.

"One Health is an integrated, unifying approach that aims to improve the health of humans, animals and ecosystems in a sustainable way and to optimise them. It recognises that the health of humans, domestic and wild animals, plants and the wider environment (including ecosystems) are closely interconnected and interdependent. The approach mobilises different sectors, disciplines and communities at different levels of society to work together to promote wellbeing and address threats to health and ecosystems, while meeting collective needs for clean water, energy and air, safe and nutritious food, taking action on climate change and contributing to sustainable development"<sup>1</sup>.

The reorganisation of the platform is intended to support the implementation of the One Health approach in research and promote inter- and transdisciplinary research activities in order to contribute to improving the health of humans, animals and the environment as well as to the sustainability goals of Germany and the United Nations. In addition to constant environmental conditions, changing anthropogenic changes such as increasing livestock densities, changes in land use, environmental pollution, loss of biodiversity, climate change and reduced soil fertility are interrelated and can increase the risk of developing communicable and non-communicable diseases. The aim is therefore to enable an even faster and more effective response to changing research issues in the One Health field.

The platform's activities centre on One Health issues of direct relevance to human, animal and environmental health, with a particular focus on the interfaces between these sectors in the sense of bringing together expertise from research and practice to build a One Health research community.

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<sup>1</sup> 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).

Initially, the focus will be on infectious diseases, antimicrobial resistance (AMR) and the connection between infectious diseases/AMR and climate, the environment, biodiversity and human behaviour. Within this thematic framework, the platform will undertake a science-driven and demand-orientated further development of additional thematic priorities such as environmental health and non-communicable diseases. **Accordingly, this research agenda sees itself as a dynamic paper that will be further developed in line with demand.**

As part of the further development of the platform, the aim is to achieve closer integration of specialised disciplines in (human and veterinary) medical research with climate and environmental research, including at an international level. This should, for example, lead to a better understanding of the connection between environmental pollution, land use concepts, farm animals, changes in biodiversity and climate change and the health of animals and humans. As social, economic, cultural, ethical and political influences also play a role, the integration of other scientific disciplines, such as the social sciences and humanities, into OHP is also being sought. The aim is to consistently think about the environment and health together and to generate interdisciplinary and transdisciplinary results that make people and animals healthier and at the same time preserve the environment.

Project funding can take place in two project formats, as 1) a pilot project or 2) an 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. Senior and junior scientists are eligible to apply. Project funding can be understood 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 topics will be addressed first:

## Research topics

### **I. Influence of environmental and climate changes as well as socio-economic processes on the emergence, spread and characteristics of human pathogenic infectious agents transmissible between sectors, their vectors and antibiotic resistance**

The emergence and spread of known, new and/or novel variants of known, transmissible zoonotic pathogens as well as the change in habitats and reservoirs for known and previously unknown pathogens and the increase in antimicrobial resistance constantly pose new challenges for research. Infectious diseases in humans caused by pathogens that are transmissible between sectors are part of a complex interplay of a multitude of factors from the environment, host, reservoir and pathogen. Central research topics are the surveillance and understanding of pathogen reservoirs, vectors and infection chains of human pathogens that are transmissible between sectors and antibiotic resistance as well as the effects of climate and other environmental changes (e.g. changes in land use, loss of biodiversity, pollution and nutrient loads) and new health risks due to transmissible infectious hazards.

In terms of social and economic relevance, it is a top priority for infection research stakeholders in the context of One Health to know which pathogens, resistances, hosts and reservoirs play a role on a global level, which changes may occur and which socio-economic processes drive these and which behaviours are particularly risky. When planning and analysing such studies, attention is paid to the inclusion of epidemiology as a cross-sectional discipline.

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

A deeper understanding of abiotic and biotic factors (transmission, host switching, ecological niche) in the emergence and spread of new or novel pathogens and their transmission pathways between the environment, wildlife, livestock and humans is important to understand the impact of anthropogenic disturbances on health-related processes (e.g. impact of mass drug administration on ecosystems). Knowledge of the molecular mechanisms of host-pathogen interaction is also essential for research into host factors and infectious agents between the human-animal-environment sectors in order to develop or improve diagnostic markers. These form the basis for the detection and characterisation of (new) pathogens and resistances,

and the tracking of infection progression in individual hosts or populations. Knowledge of the interaction between pathogen and host also forms the basis for the development of therapeutic strategies.

Research into the pathogen-associated factors and the ecological niche that determine the virulence and pathogenicity of a pathogen is a prerequisite for the development of predictive models that are essential for the risk assessment of transmissible infectious agents in the One Health context and antibiotic resistance.

To ensure the acceptance and effectiveness of preventive and therapeutic measures 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.

### **III. Systematic data pooling, networking and evaluation: One Health knowledge management**

The pooling of epidemiological data on the spread of infectious agents in the One Health context and 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 service/veterinary services/environmental agency), 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 relationships and solid modelling. 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, thereby reducing damage.

### **IV. Networking between scientific institutions and authorities at all levels**

Close networking between science and the responsible authorities (public health services/veterinary services/environmental authorities) is essential in order to utilise research results for the health protection of the population, the environment and animals. This networking promotes both the early application of research results and the identification of research questions that arise in the day-to-day work of health, veterinary and environmental authorities. Strong networking between research and the authorities responsible at local and state level is therefore desirable in addition to networking between universities and federal institutes and between the authorities.

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

#### **V. Networking with stakeholder groups 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, raising awareness of the topic and achieving acceptance of any necessary interventional measures to contain infection incidents. The aim is therefore to involve relevant stakeholder groups in society, for example through citizen science projects, and also to include other relevant disciplines in this context, such as the social sciences. Attention must be paid to the varying accessibility of different population groups and their specific vulnerability to zoonotic diseases and resistant pathogens.