

# From One Health to Ecohealth, mapping the incomplete integration of human, animal and environmental health

**Serge Morand (CNRS-Cirad), Jean-François Guégan (INRAE-IRD), Yann Laurans (IDDRI)**

Over the last twenty years several concepts have emerged advancing the integration of human health into its animal and ecological environment. In the context of the environmental crisis, particularly global warming and biodiversity collapse, as well as economic globalization, some of these concepts have today taken on a significant media and political dimension. However, the Covid-19 pandemic has underlined the less than satisfactory integration of these issues. This *Issue Brief* provides a critical analysis of the various concepts proposed, highlighting their strengths and weaknesses, considered from the perspectives of the effective integration of sustainable development dimensions and their policy implementation.

## KEY MESSAGES

The One Health approach, and the tripartite association between the World Health Organization (WHO), the World Organisation for Animal Health (OIE), and the United Nations Food and Agriculture Organization (FAO), had great potential for the integration of all dimensions of the issues raised by the risk of human infectious diseases of animal origin (zoonoses). However, this concept has largely maintained the disconnection, instead favouring a veterinary infectious disease approach, lacking a real capacity to address environmental dimensions and the means to develop policy instruments.

Combining ecology and health, EcoHealth remains overly focused on the analysis of environmental risk factors for human health, failing to propose an approach that integrates health, veterinary and ecological management models.

The Global Health approach reflects a strong awareness of the interrelationships between globalization and human health, but remains primarily focused on the individual and medicine.

Finally, the Planetary Health concept stems from a recognition of the planet's limits, proposing an inclusive approach with a particular emphasis on the social dimensions of health, but has not led to practical and effective recommendations.

Overall, two issues are apparent, firstly the difficulty of truly integrating the three dimensions of human, animal and environmental health, and secondly the difficulty involved in the policy implementation of the concepts, potentially innovative and ambitious, that have been put forward over the last twenty years to make progress in this field. Such policy implementation must be addressed at the level where it can achieve the greatest effectiveness in terms of preventing the next pandemic: integrated and multilateral.

To this end, a multilateral policy and programming mechanism is desirable, based on the model of a United Nations Convention, similar to the Convention on the Law of the Sea, or a cross-cutting action programme such as the Water Convention or UN-Water.

## 1. ONE HEALTH: HUMANS ARE VULNERABLE TO ANIMAL INFECTIONS

Although created as early as 1984, it was not until 2004 that the World Conservation Society (WCS), one of the leading international biodiversity non-governmental organizations, truly engaged in the issue with the One World One Health (OWOH) initiatives and the Twelve Manhattan Principles. The third of these principles considers that taking wildlife health into account is an essential component of global disease surveillance, prevention and control. The fifth principle, which is more inclusive, recommends the development of proactive and integrative approaches to understand and prevent the development of emerging and re-emerging infectious diseases, taking better account of all the complex interconnections that exist between species in ecosystems.

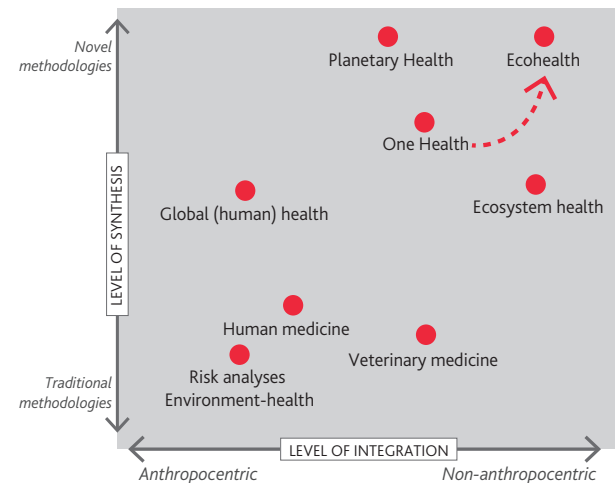
These initiatives are referred to as One Health by the WHO, OIE and FAO. The One Health approach was officially launched in 2008 in Vietnam as an agreement in principle to improve tripartite collaboration. While this stimulated the development of new research programmes, it did not lead to the creation of new institutions or even to the production of specific standards for human or animal health or biodiversity management. A significant number of countries, particularly in Africa, adopted the One Health concept even though it did not give rise to any practical initiatives, particularly in terms of development assistance. While the US Agency for International Development (USAID) regarded One Health as a way to initiate a major research programme on emerging viruses, known as PREDICT, the French Development Agency did not consider One Health aspects until towards the end of 2010.

The concept was very much in line with the public health principles of the colonial era, a time when many attempts were made to link human, animal and environmental health, and which was marked by a strong distinction between colonial scientific administrators and controlled local populations. In the 1930s, The African Survey emerged as a network of academics and civil servants from various institutions: the Tropical Medical Schools of London and Liverpool, Imperial Forestry Institute in Oxford, and the Imperial Agricultural Bureau that became the Centre for Agricultural Bioscience International (CABI) following the independence of former colonies. It is important to analyse the potential impact of this history and of these institutions in the attempt to put the One Health concept into practice, particularly in the light of the comprehensive historical work on these subjects.

More recently the One Health concept has given rise to new research subjects that are very different to animal and human infectiology, particularly related to toxicology and ecotoxicology (Destoumieux-Garzón *et al.*, 2018). It has therefore become an "umbrella" concept, sometimes presented as deriving from a "holistic" (although it is really only a little more open than specialized approaches) and multidisciplinary vision. However, it has been marked by its major focus on infectiology, and a gradual confusion with the EcoHealth concept over time, as fields and

research subjects were incorporated (the environment in particular) that were not originally addressed (Roger *et al.*, 2016) (see Figure 1).

**FIGURE 1. Schematic representation of the concepts discussed in this article**



Source: Modified from Assmuth *et al.* (2019). Note: over time the One Health concept has moved closer to the EcoHealth concept by becoming more inclusive.

It is clear that the environment, biodiversity and traditional rural societies remain largely absent from the concerns of this approach, especially in times of health crises (Lainé and Morand, 2020). The management of such crises, which represent exceptional periods for veterinary and public health action, generally leads to the promotion of biomonitoring and biosecurity, the effects of which are rarely assessed, particularly in cases of the mass culling of wild or farmed animals.

## 2. ECOHEALTH: TRANSCENDING DISCIPLINARY DOMINANCE

An approach that gave greater importance to the ecological and evolutionary dimensions of infectious diseases was developed at the end of the 19th century by epigones of Louis Pasteur. Ecological infectiology took off intellectually in the early 2000s, giving rise to "ecological health" (Lebel, 2003, 2004; Guégan and Renaud, 2004) or Ecohealth. The aim was to extend the scope of analysis that was traditionally centred on human health, to also consider ecosystem changes, animal pathology issues as well as human health, with all their direct and indirect interactions, with the inclusion of plant health. This approach and the perspectives it offered was gradually established within policies for sustainable development and cooperation with the world's poorest countries, for example the action for development assistance implemented by the Canadian International Development Research Centre.<sup>1</sup>

<sup>1</sup> <https://www.idrc.ca/fr/node/13257>

In its original sense, which is primarily Canadian and French, we find an integrative and transversal vision, based on an understanding of the dynamic balances between naturalness, humans, uses and human practices in a world of limited dimensions. This approach focuses as much on the health fields related to infectious diseases as it does on chronic diseases caused by chemical substances and new materials such as nanoparticles and their consequences, not only for human health, but also for biodiversity and, more generally, for sustainable development. It adopts citizen participatory approaches and corresponds to the integrative logic of the UN's 2030 Agenda for Sustainable Development.

A second sense, closely associated with the research of a particular foundation<sup>2</sup> that was created fifteen years ago also under the name of Ecohealth, focuses more on the idea of understanding and analysing possible human pathogens by exploring biodiversity. The approach therefore remains centred on human and individual health, and focuses on the environment as a risk factor and source of infection. This approach structures USAID's major research programme PREDICT, and is also being applied to the Global Virome Project.<sup>3</sup>

### **3. GLOBAL HEALTH: PUTTING JUSTICE AT THE HEART OF HEALTH**

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The term Global Health was introduced as early as 1971 by the WHO in a report to the US House of Representatives entitled *The Politics of Global Health*. In 1993 the WHO assumed the role of international coordinator for global health, a role that was given full expression in 1998 when Gro Harlem Brundtland took over as the organization's head, putting the WHO at the centre of the Millennium Development Goals.

The Global Health approach represents a real awareness of human medicine, often captured by very local and individualized approaches, and of global issues such as climate change and intercontinental trade.<sup>4</sup> This approach remains today, however, both "individual-centred" and "medicine-centred".

### **4. PLANETARY HEALTH: THE PLANETARY LIMITS**

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Building on the work of the Stockholm Resilience Centre (Rockström *et al.*, 2009) on the Anthropocene,<sup>5</sup> the Planetary Health approach emphasizes that "human health and human civilization depend on flourishing natural systems and their wise stewardship", and stresses that "solutions are within reach and should be based on the redefinition of prosperity to focus

on the enhancement of quality of life and delivery of improved health for all, together with respect for the integrity of natural systems", but acknowledges that "the present systems of governance and organisation of human knowledge are inadequate to address the threats to planetary health" (Whitmee *et al.*, 2015). This approach, also put forward by The Lancet and the Rockefeller Foundation (Whitmee *et al.*, 2015), better meets the aspirations of a global and transdisciplinary approach. It is inspired by international public health and epidemiology. It is imbued with a form of humanist activism, focusing on the social determinants of health, and is the dominant approach of the major American schools of public health, the American Association of Public Health, and non-governmental health organizations such as the International Red Cross. It is based on the recognition that there are planetary limits to human activities.<sup>6</sup> Here, Planetary Health and Ecohealth come together as an announced prefiguration of the rapprochement between epidemiology and public health on the one hand and health ecology on the other.

### **5. TAKING GLOBAL HEALTH CONCEPTS SERIOUSLY: TOWARDS POLICY IMPLEMENTATION**

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One Health is an important initiative, particularly as it is the only one so far bringing together international agencies with the capacity to intervene. However, it is marred by two major shortcomings that limit its effectiveness. Firstly, despite the principles under which it operates, One Health does not practically succeed in truly integrating the three dimensions of medicine, animal health and ecology. Secondly, the WHO-FAO-OIE "tripartite" has remained a principle of collaboration between specialized agencies, without a specific and funded action programme being associated with this triad, which has however proved crucial in reducing the risk of epidemics.

EcoHealth is a partial response to this difficulty. It has had the notable effect of inspiring better-designed development assistance, but has not led to institutional changes at the multi-lateral level that could give substance to policies to address the environmental causes associated with emerging infectious risks (on this point see the initiative of the Global Research Projects of the international FutureEarth Programme).

It is therefore less important to define the encompassing concept than it is to have a concrete willingness to integrate the medical, animal health and ecological dimensions in order to analyse and understand the problems of health crises and disasters, upstream of the emergence of infectious agents. The possibility of organizing research and expertise (analysing and understanding) is an essential step, partly carried out in forums such as FutureEarth, but incompletely organized as structuring research communities. However, the transition to an action programme is an even more complex step. The Covid-19 pandemic revealed the current difficulties of institutional,

<sup>2</sup> <https://www.ecohealthalliance.org>

<sup>3</sup> <http://www.globalviromeproject.org/>

<sup>4</sup> <https://globalhealth.harvard.edu/>

<sup>5</sup> International Geosphere-Biosphere Programme. <http://www.igbp.net/>

<sup>6</sup> <https://www.unescap.org/blog/towards-post-covid19>

health and economic systems in learning lessons from recurring infectious outbreaks, in terms of actions of prevention, global surveillance and building resilience.

National and international positioning, with reference to the health concepts presented in this *Issue Brief*, must be better asserted to strengthen resilience and transformation trajectories that are compatible with sustainable development, in accordance with Agenda 2030.

Giving political substance to such an integrative logic would imply, in particular, finding out how to truly address the issues of biodiversity, despite their complexity and broad nature, in the institutional changes that must be envisaged. This will mean identifying the "hot spots" of prevention, in particular the protection of areas with wild fauna and behaviours likely to generate risks, to establish a real protection policy, avoiding the technocratic pitfall of simple administrative zoning.

The same applies to the veterinary aspect: since the greatest zoonotic risk is associated with livestock farming (avian influenza in particular), wide-ranging policies need to be designed and implemented in the effort to reduce risks through taking action on demand, on farming modes and on sanitary practices. To this end, several options are available, including the idea of a UN Convention that would address all of these issues together, and would organize the distribution of work between international agencies, other conventions and state obligations, along the lines of the Convention on the Law of the Sea.<sup>7</sup> A simpler option would be a UN cross-cutting programme, such as the one that exists for water, UN-Water, but which offers a form of coordination. One of the stumbling blocks is likely to be the definition of circumscribed, pragmatic and prioritized missions for the "biodiversity/ecosystems" dimension of the triad. Indeed, this dimension implies the questioning of economic and social choices, and therefore refers to fundamental political changes in development and food, which are determinants of the "health" of ecosystems and therefore of the health risks of tomorrow.

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<sup>7</sup> <https://www.iddri.org/en/publications-and-events/other-publication/what-type-global-governance-could-improve-fight-against>

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## CONTACT

yann.laurans@iddri.org

Institut du développement durable  
et des relations internationales  
41, rue du Four – 75006 Paris – France

[WWW.IDDRI.ORG](http://WWW.IDDRI.ORG)

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