

Collaboration between human and veterinary medicine as a tool to solve public health problems



The implementation of an effective collaboration between human and veterinary medicine, environmental protection, and public health is not a fully achieved goal, although several examples of integrated approaches have been documented in Europe. The concept of one world, one health has recently appeared, indicating that the world has suddenly woken up to the link between animal diseases, public health, and the environment. The need for collaboration between the human, animal, and environmental health sectors is due to the increase in emerging human infectious diseases with a zoonotic origin and in the resistance of microorganisms to antimicrobial drugs.¹ The main fields in which this new concept of collaboration has been applied are zoonosis and zoonophylaxis, vaccines, and antibiotic resistance, via the establishment of networks of professionals in the One Health area. The historical background of One Health laid the foundations for the realisation of concrete interventions or future perspectives of collaboration between human, veterinarian, and environmental institutions.

In the late 19th century, German physician and pathologist Rudolf Virchow (1821–1902) coined the term zoonosis and stated that “between animal and human medicine there are no dividing lines—nor should there be”.² The dimension of the zoonosis problem is a cause for alarm because zoonotic pathogens represent a clear threat to global health: these pathogens are globally present, accounting for about 75% of emerging infectious diseases affecting humans. Over the past year, zoonotic pathogens caused more than 2 million deaths and over 2 billion cases of human illness.³ Zoonotic diseases are a growing concern: approximately 60% of existing human pathogens and over 75% of those appeared during the past two decades can be traced back to animals.⁴

Only since the 1990s has the relationship between human and veterinary medicine started receiving substantial attention from the scientific community.

Many examples of successfully realised integrated approaches have shown how human health is related to the health of animals and the environment (eg, in the spreading of diseases such as rabies, salmonellosis, west

Nile virus fever, Q fever, bovine amyloidotic spongiform encephalopathy). Some collaborations between human and veterinary medicine were proposed for the future, but have not been realised yet. Among these projects are those for the elimination of neurocysticercosis and the control of its public health impact in endemic areas, by proposing operational interventions based on oriented chemotherapy, using existing healthcare facilities, and improving collaboration between medical and veterinary services;⁵ the organisation of international meetings involving specialists in different areas; and the implementation of veterinary urban hygiene, a cultural revolution in the zoonosis approach, defined as the activities that deal with health aspects associated with human–animal–environment connections in urban areas.⁶

As concerns vaccines, they have a key role within One Health since they can control disease transmission between humans and animals, and have a concrete impact on their shared environments. The best-known example of a vaccine contribution in terms of One Health is provided by the discovery of the vaccination against smallpox. This discovery was based on the close resemblance of smallpox, a human disease, to cowpox, a zoonotic disease affecting animals: the observation that dairy farmers were immune to smallpox inspired the production of the first smallpox vaccine, which was the first step towards eradication of this disease.

Other examples are the campaign to develop the canine-distemper vaccine in the UK between 1922 and 1933, which was based on collaborations between veterinary professionals, government scientists, the UK Medical Research Council, and a commercial pharmaceutical house,⁷ and the development of the diphtheria antitoxin in the late 19th century, which played a significant role in the history of public health and vaccinology. Furthermore, a new generation of cost-effective and efficient poultry vaccines could be applied in the future with mass immunisation methods that would induce local immunity to control the spread of the H5 and H7 avian influenza virus subtypes.⁸

Interprofessional collaboration has been promoted worldwide by the creation of networks of professionals in the fields of health and environment, tasked with

bridging the communication gap between science and society: the Med-Vet-Net network, the HENVINET project, ArboZoonet, Disease Bioportal, GLEWS, Global Food Safety Portal, NBIC, and EpiSPIDER represent some of the most important examples.^{9, 10}

Although increasing attention has been given towards One Health programmes, many European countries show little cooperation among different areas. Many countries have merged the One Health approach with their policies against zoonosis and antimicrobial resistance, and veterinarians seem to show a greater awareness of the importance of cooperation activities and continuous cross-sectoral formation than do medical doctors. The institution of a specific founding system for One Health initiatives could help to break down barriers with the aim of promoting a multidisciplinary attitude.

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We declare no competing interest.

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