

# The veterinary profession and one medicine: some considerations, with particular reference to Italy

Giorgio Battelli<sup>(1)</sup> & Adriano Mantovani<sup>(2)</sup>

## Summary

The concept of 'one medicine' and its evolution are discussed and some considerations on the relationship between 'one medicine' and veterinary profession are made, with particular reference to Italy. The concept of 'one medicine' is mainly associated with public health and has its roots in the Italian tradition and health organisation. In a future which is already with us, the veterinary profession will be called upon to deal with many problems at worldwide level (e.g. the emergence/re-emergence of new/old zoonotic pathogens, biological and chemical contaminants in food, bacterial resistance to antibiotics, non-epidemic emergencies associated with natural or man-made disasters, animal well-being, etc.), integrating with other professions. In Italy, most of these problems find the Veterinary Services prepared, but not homogeneously throughout the country. At the present time, doubts are expressed on maintaining and improving these services, mainly due to the lack of students interested in veterinary public health (VPH) training. The globalisation of the veterinary profession imposes changes, in both culture and training. The expertise required for 'one medicine' must be considered and aspects of veterinary training should be changed to promote sharing expertise with other professionals, mainly within the Italian Health Service. The public should be informed about professional competence and activities of veterinarians, in both the private and public sectors, in order to offer a true picture of the

profession, one that is not limited to the conventional model which the public generally has of veterinary medicine.

## Keywords

Italy, One health, One medicine, Public health, Veterinary education, Veterinary medicine, Veterinary public health, Veterinary profession.

## Professione veterinaria e medicina unica: alcune considerazioni, con particolare riferimento all'Italia

### Riassunto

*Vengono discussi il concetto di 'medicina unica' e la sua evoluzione, fornendo alcune considerazioni sui rapporti tra 'medicina unica' e professione veterinaria, con particolare riferimento all'Italia. Il concetto di 'medicina unica' è soprattutto legato alla pratica della sanità pubblica e trova le sue radici nella tradizione italiana e nella sua organizzazione sanitaria. In un futuro già iniziato, la professione veterinaria è chiamata a confrontarsi con numerosi problemi a livello mondiale (ad es. l'emergenza/riemergenza di nuovi/vecchi agenti zoonotici, contaminanti biologici e chimici negli alimenti, il fenomeno dell'antibiotico-resistenza, le emergenze non epidemiche associate a disastri naturali o causati dall'uomo, il benessere animale, ecc.), integrandosi con altre professioni. In Italia, molti di questi problemi trovano i Servizi Veterinari preparati, ma non in modo omogeneo su tutto il territorio. Al momento attuale, sussistono dubbi sul mantenimento o miglioramento di questi Servizi,*

(1) Dipartimento di Scienze Mediche Veterinarie, *Alma Mater Studiorum* Università di Bologna, via Tolara di sopra 50, 40064 Ozzano dell'Emilia, Bologna, Italy  
giorgio.battelli@unibo.it

(2) Former Director of WHO/FAO Collaborating Centre for Research and Training in Veterinary Public Health, Italian National Health Institute, Viale Regina Elena 299, 00161 Rome, Italy

*soprattutto per carenza di studenti interessati alla Sanità Pubblica Veterinaria (SPV). La globalizzazione della professione veterinaria impone cambiamenti culturali e formativi. Le competenze richieste per la 'medicina unica' dovrebbero essere tenute in debita considerazione e gli aspetti della formazione del veterinario dovrebbero essere modificati, per promuovere scambi culturali, didattici e di ricerca con altri professionisti, soprattutto nell'ambito del Servizio Sanitario Nazionale. Il pubblico dovrebbe essere informato su competenze e attività dei veterinari, a livello sia privato sia pubblico, per offrire un quadro reale della professione, non limitato al modello convenzionale che il pubblico generalmente ha della medicina veterinaria.*

#### **Parole chiave**

Italia, Formazione veterinaria, Medicina unica, Medicina veterinaria, Professione veterinaria, Salute unica, Sanità pubblica, Sanità pubblica veterinaria.

## **Introduction**

In the 19th century, the German physician and pathologist R. Virchow, believed to be the first to use the term *zoonosis* in the scientific literature, stated: 'Between animal and human medicine there are no dividing lines – nor should there be. The object is different but the experience obtained constitutes the basis of all medicine' (6). From this starting point and from the growing importance taken on by animal diseases in the socio-economic and public health setting, C.W. Schwabe (American veterinarian, epidemiologist and parasitologist) was the first to introduce into the scientific literature the term 'one medicine' in 1984 (9). He believed that the true role of 'one medicine' lay in the fact that veterinary medicine, like human medicine, was an activity created by man mainly for its positive effects on physical and mental wellbeing, i.e., on health. Schwabe stressed the increasing interdependence between animals and their products and human health problems, and firmly supported the interdisciplinary approach to human and animal health and the need for collaboration between human medicine, veterinary medicine,

and all professions contributing to public health in general.

The concept of 'one medicine' has been part of the Italian tradition from Renaissance times onwards. An important exponent was Ramazzini, believed to be the founder of occupational medicine, who used the term 'comparative pathology' in order to define 'one medicine'. More recently, we find masters like Alessandrini, Brazzola, Caporale, Ercolani, Lanfranchi, Messieri, Perroncito, Rivolta, Sertoli, Viviani and others, who have continued the tradition.

There are various definitions of 'one medicine'. Among them, the following – which are not in contrast with any of the others – seem to be the most appropriate, mainly when viewed within the framework of public health:

- the practice and general science of health and disease in man and animals
- the reciprocal contribution which human and veterinary medicine can give to the health and wellbeing of both people and animals
- the practice and science composing those branches of human and veterinary medicine linked to each other by public health.

## **A look at the past**

Historically, human and veterinary medicine have been called a *unicum*, according to the holistic model, devoted to the health and wellbeing of humans and animals, and to respect for the environment. The concept of 'one medicine' has several roots, each one sufficient to explain it (8):

- the *unicum* of the living environment and the factors which influence health and disease, including social components
- the common origin and/or manifestation of human and animal diseases
- the contribution which medical and veterinary science can make towards solving problems of human medicine (and vice versa), both in the fields of knowledge and of research (comparative medicine) and in order to solve practical problems.

Primitive healers dealt with diseases in both humans and animals. Babylonian and

Egyptian priests treated both people and animals. During the Greek and Roman periods, the concept was accepted by important authors such as Hippocrates and Virgil. During Medieval times, the tendency to separate the two types of medicine prevailed, for religious and practical reasons. The concept that man, created in the divine image, could have the same diseases as animals was rejected. This opinion, except for rare exceptions such as that of Fracastorus, prevailed until the mid-17th century. The Renaissance saw the rise of comparative medicine in fields such as anatomy, physiology, parasitology, and others. Between the 16th and 20th centuries, significant contributions came not only from physicians, such as Lancisi (the first to propose 'stamping out', i.e., compulsory killing to combat animal epidemics), Malpighi, Ramazzini, Ruini, Vallisnieri and Virchow, but also from scientists such as Bassi, Corti, Muratori and Pasteur, who made great contributions to the grand rebirth of comparative medicine. Industrialisation (urbanisation), trade and human over-population accentuated the consequences of animal plagues which – since farriers were also often the veterinarians of the times, being the only ones who devoted themselves to healing animals – were to be contrasted by the best physicians and other scientists. The distinction between humans and animals lost much of its credibility after Darwin's theories and Jenner's revolutionary discovery, when in 1796 he demonstrated that implanting cowpox in humans could protect against smallpox.

The establishment of veterinary Schools strengthened and formalised the division between the two medicines and defined their specific spheres of activity, even though most of these schools derived from the medical ones. The constitution of professional orders first, and of trades-unions later (this was the case in Italy; in some nations the opposite occurred) produced a better definition of the respective positions, or even the adoption of more rigid ones.

Acknowledging the importance of bridging such a division for global public health, the

World Health Organization (WHO), established in 1948, devoted a programme to veterinary public health (VPH).

The leading physicians and other scientists who had concentrated on veterinary problems, which included the formation of Schools of veterinary medicine, believed in the unicity of science (comprising medicine), and devoted themselves *naturally* to work which involved people, animals, and also often plants. Similar positions were held by important veterinarians who dealt with problems regarding human medicine. In practice, many supporters of science had been convinced of the existence of 'one medicine' from its very origins. Divergences, based on ideological, corporative and caste positions, and persistent cultural limitations, were inevitable and presently persist.

## One medicine, one world, one health

The concept of 'one medicine' has evolved considerably since the writings of Schwabe. In 2004, a symposium was organised at Rockefeller University (New York) focusing on the globalisation of diseases in man, domestic and wild animals, and on the possible interchange of emerging infections among species (11). Experts worldwide (physicians, veterinarians, biologists, agronomists, geologists, etc.) and representatives of many international organisations, in the health sector or otherwise, defined the priorities for an interdisciplinary approach to the struggle against threats to health and the environment, and presented a list of 12 principles, known as *The Manhattan Principles on One World, One Health*. These principles encouraged world leaders, society, experts in public health and scientific institutions towards a transversal and interdisciplinary approach to the prevention, surveillance and control of diseases, capable of guaranteeing biological integrity and conserving the environment for future generations.

The interdependence between humans, animals and the environment has never been so clear-cut and important as it is now. The

many initiatives undertaken – for example, those in conjunction with the WHO, Food and Agriculture Organisation (FAO), World Organisation of Animal Health (OIE: *Office International des Épizooties*) and others (4, 5) and that of the European Union (EU) (3) – to implement strategies against diseases common to both man and animals, to extend interprofessional collaboration and to promote the health of living beings and of the planet, adopted as their slogan *One World, One Medicine, One Health*. Thus, the concept of ‘one medicine’ has evolved as a more far-ranging concept, that of ‘one health’, an aim to be achieved by integrating human and veterinary medicine and other branches of science and by organising proper training, health education, epidemiological surveillance, public health activities, scientific research, etc. (7).

## One medicine and the veterinary profession

The concepts of ‘one medicine’ and ‘one health’ – which may be viewed as synonyms – are mainly associated with public health, i.e., the social role played by veterinary medicine, and have their roots in the Italian tradition (1, 2). Indeed, Italian Veterinary Services belong to the field of public health administration, unlike the case in most other countries, where they belong to that of agriculture. At the present time, an approach of EU to the ‘Italian model’ is taking place, justified mainly by the interest of the Italian legislation in food safety and other consumer problems.

There are many problems which currently prevail, are emerging worldwide, and require the particular attention and involvement of the veterinary profession. The main ones, closely associated with the others, may be listed as:

- the emergence/re-emergence of new/old zoonotic pathogens: several factors – such as the increased trade in products of animal origin, movements of people and animals and the speed of all means of transport, climatic changes, food habits, farming techniques, and several others – have all favoured the onset and worldwide spread of new zoonoses (note that about 70% of

emerging and re-emerging infections are zoonoses or diseases transmitted by vectors, such as insects and ticks)

- the role of wildlife as carriers of infections to humans and domestic animals, and vice versa
- the role of animals as suppliers of food, work and company, and other products indispensable for man
- the world market in food and animal products, sometimes exotic (it is estimated that the demand for protein of animal origin worldwide will increase by 50% by the year 2020)
- the availability of food and water, closely connected with food safety
- biological and chemical contaminants in food and in the environment, and bacterial resistance to antibiotics (an expanded concept of zoonoses)
- the increasingly frequent industrialisation of animal productions and connected pathologies
- the deterioration of the environment and threats to the ecosystem
- bio-terrorism, due to the possible use of agents of easily spread or extremely lethal animal diseases, both for animals themselves and/or for man, or of toxic substances deliberately put into food
- the increased numbers of allochthonous animal species, disappearance of autochthonous species, and reduction of biodiversity
- non-epidemic emergencies associated with natural or man-made disasters
- growing urbanisation, and the management of animal populations and their relationship with man and the environment
- the use of animals as instruments for health and therapy for people (‘pet therapy’)
- increasing requests from the public to safeguard and enhance the well-being of animals and respect for them, including food-producing animals.

In a future which is already with us, the veterinary profession will be called upon to deal with these problems, integrating with other professions and facing them as efficaciously and efficiently as possible, by



means of actions and competences which are defined as 'global veterinary public health' (10).

In Italy, most of these problems find the veterinary services prepared, but not homogeneously throughout the country: there are still areas poorly served. However, at the present time, strong doubts are expressed about the maintenance or improvement of these services – not only for economic reasons, but mainly due to the lack of a generational exchange of students interested in professional training in VPH. The problem will make itself felt in a few years' time, when the Italian Health Service will require a very large number of veterinarians trained in VPH, since many of the current staff will have reached retirement age.

## One medicine and veterinary education

The foreseeable future in the veterinary professions and in VPH worldwide, together with the concept and practice of 'one medicine', does not seem particularly suitable for present methods of teaching and research, which favour specialisation and isolation of research activities (and often also the limited knowledge, mainly of young veterinarians) to restricted fields. These are far from the context in which students and graduates are living and must work. It should be stressed that the same assessment criteria of research, created for essentially economic purposes but now at the basis of university assessments of all kinds, oblige researchers at the Faculties of veterinary medicine to devote themselves to hyper-specialist topics, welcomed by international journals, but often short-lived and far from the professional reality and future described above. The result is that, except in rare cases, VPH and allied disciplines (e.g., epidemiology) are obstructed at the level of university training and post-graduate specialisation. It is an unfortunate fact that, on a European level, the Faculties of veterinary medicine are increasingly moving towards training in clinical veterinary disciplines – which, although of course important, comes at the

expense of initiatives and *curricula* which aim at VPH training – in spite of the recommendations and current requirements expressed, for instance, by the FAO, OIE, WHO and EU.

It should be emphasised that, in Italy, one obstacle to the acquisition of the concept and practice of 'one medicine' is partly the excessive number of veterinarians (now more than 27 000 graduates from as many as 14 faculties) who are obliged (or advised) to aim at freelance work which often has little to do with the holistic practice of medicine. The mass media and the general public only know (or think they know) about veterinary medicine in as much as it focuses on domestic pets and animals used in sports or recreative activities. Italy is now one of the countries with the largest number of small animal veterinarians and surgeries for small animals in relation to the number of animals and inhabitants. Another obstacle is that economic interests favour veterinary medicine associated with diagnosis and treatment for animals, mainly pets, rather than medicine linked with public health. Lastly, factors such as corporativism and sectionalism preclude inter- and intra-professional contacts and collaboration. We are therefore faced with a mix of both large and small interests and socio-political situations which are opposed to the harmonious development of healthcare and culture, both necessary for 'one medicine' and 'one health'.

In consideration of these factors, the authors express the opinion that presently we are facing 'two veterinary medicines', one centred on public health and consumer protection, the other centred on clinical practice, especially of pets.

## Facing changes, seizing opportunities

The future scenarios and challenges involved in the globalisation of the veterinary profession impose changes, in both culture and training. The competences required of veterinarians in the 'one medicine' challenge, now part of the strategies of international

organisations and culturally linked to our traditions and to the organisation of Italian public health, must be considered as work opportunities to be seized soon.

Although high-level clinical training is still essential, we must realise that freelance work, particular in the pet sector, will encounter increasing competition, mainly at the expense of young graduates.

There are several aspects of the current veterinary education which should be changed:

- basic training must supply the essential elements of VPH
- a special, possibly post-graduate, *curriculum* must be created, in order to improve professional skills in VPH
- students must be encouraged to consider *curricula* in VPH
- cultural, teaching and research exchange programmes must be promoted with other

professionals, mainly within the Italian Health Service

- proper, permanent training in VPH must be developed.

These actions and their results must be monitored and, if necessary, modified to fit new circumstances.

It is also essential to inform the public, particularly the students, about the competences and activities of veterinarians, in both the private and public sectors, in order to offer a true picture of the profession, not limited to the conventional model which the public generally has of veterinary medicine.

The future of the Schools of veterinary medicine will depend not only on social and political factors, but also on the capacity to satisfy emerging needs, including collaboration with the mass media, for better coordination with the public.

## References

1. Battelli G., Mantovani A. & Marvasi L. 2009. Le professioni contemporanee – I Veterinari. *In* Atlante delle professioni (M. Malatesta, ed.). Bononia University Press, Bologna, 167-173.
2. Donelli G., Lasagna L., Macri A. & Mantovani A. 2005. Sull'afferenza dei servizi veterinari all'amministrazione pubblica italiana: una ricostruzione storica. *In* Proc. 35th International Congress of the World Association for the History of Veterinary Medicine (A. Veggetti, I. Zoccarato & E. Lasagna, eds), 8-11 September 2004, Grugliasco (To). Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, 273-283.
3. European Union 2007. Animals + Humans = One health. A new animal health strategy for the European Union (2007-2013), where 'Prevention is better than cure' ([www.one-health.eu/ee/en](http://www.one-health.eu/ee/en) accessed on 11 December 2011).
4. Food and Agriculture Organisation (FAO)/World Organisation for Animal Health (OIE: Office International des Épidémiologies)/World Health Organisation (WHO) 2010. The FAO-OIE-WHO collaboration – Sharing responsibilities and coordinating global activities to address health risks at the animal-human-ecosystems interfaces – a tripartite concept note. FAO, Rome, 6 pp ([www.fao.org/docrep/012/ak736e/ak736e00.pdf](http://www.fao.org/docrep/012/ak736e/ak736e00.pdf) accessed on 11 December 2011).
5. Food and Agriculture Organisation (FAO)/World Organisation for Animal Health (OIE: Office International des Épidémiologies)/World Health Organisation (WHO)/United Nations System Influenza Coordination (UNSIC)/United Nations Children's Fund (Unicef)/World Bank 2008. Contributing to One World, One Health – a strategic framework for reducing risks of infectious diseases at the animal-human-ecosystems interface, Consultation Document, 14 October. FAO, Rome, 67 pp ([ftp://ftp.fao.org/docrep/fao/011/aj137e/aj137e00.pdf](http://ftp.fao.org/docrep/fao/011/aj137e/aj137e00.pdf) accessed on 11 December 2011).
6. Klauder J.V. 1958. Interrelations of human and veterinary medicine; discussion of some aspects of comparative dermatology. *N Eng J Med*, **258**, 170-177.
7. Mantovani A. 2008. Human and veterinary medicine: the priority for public health synergies. *Vet Ital*, **44**, 577-582.
8. Mantovani A., Battelli G., Cosivi O., Lasagna E., Macri A. & Seimenis A. 2008. Sul concetto di 'Medicina unica'. *In* Atti V Convegno Nazionale di Storia della Medicina Veterinaria (A. Veggetti & L. Cartoceti eds), 22-24 June 2007, Grosseto. Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, 193-198 ([www2.vet.unibo.it/staff/Baldelli/Sanit%C3%A0%20Pubblica%20Veterinaria%202010](http://www2.vet.unibo.it/staff/Baldelli/Sanit%C3%A0%20Pubblica%20Veterinaria%202010)).

2011/One%20Medicine/One%20medicine\_Mantovani%20et%20al.,%202007.pdf. accessed on 11 December 2011).

9. Schwabe C.W. 1984. Veterinary medicine and human health, 3rd Ed. Williams & Wilkins, Baltimore, 680 pp.
10. Walsh D.A. (co-ordinator) 2009. Veterinary education for global animal and public health. *Rev Sci Tech*, **28**, 439-872.
11. Wildlife Conservation Society 2004. One World One Health: Building interdisciplinary bridges to health and globalized world – Conference Summary, The Rockefeller University, New York [www.oneworldonehealth.org/sept2004/owoh\\_sept04.html](http://www.oneworldonehealth.org/sept2004/owoh_sept04.html) accessed on 11 December 2011).