

Human and veterinary medicine: the priority for public health synergies

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Summary

The concepts of 'one medicine' and 'one health' are supported and visualised as a tree (medicine), placed on the fertile soil (basic sciences), which divides into the two major branches of human and veterinary medicine, connected by the large branch of public health; minor branches (specialisations) depart from the three larger ones. The synergy between human and veterinary medicine is not only a must for public health, but also implies ethical considerations. The basic reasons requiring synergy are found in the common sharing of the environment, in the use of animal products by humans, in the common culture and in the many problems to be faced together. The long list of adversities requiring synergy is topped by zoonoses (intended both in the classic and in the extended sense) and food safety that extends to many other items connected with nutrition, environment, human/animal coexistence and the management of public health; the entire quality of human life is affected. Human and veterinary medicine have a strong cultural background (many subject matters) in common, but unfortunately the undergraduate and postgraduate education programme (with few important exceptions) do not offer training in cooperation. The synergy between human and veterinary medicines is an indicator of 'good public health practice' and any obstacles to this collaboration should be identified and eliminated. The logo for a public health founded on synergy is drawn as an umbrella formed by the medical and veterinary

activities, protecting the population (consumers and producers), the animals and their products and the environment from the possible adversities linked to health.

Keywords

Animal, Health, Public health, Medicine, Zoonosis.

Medicina umana e medicina veterinaria: sinergia prioritaria per la salute pubblica

Riassunto

I concetti di "medicina unica" e "salute unica" vengono supportati e visualizzati come un albero (la medicina), piantato su un suolo fertile (scienze di base), diviso nei due principali rami della medicina umana e medicina veterinaria, collegati dall'ampio ramo della sanità pubblica; i rami minori (le specializzazioni) si diramano dall'albero più grande. La sinergia tra medicina umana e veterinaria non è solo una necessità per la sanità pubblica, ma implica anche considerazioni etiche. La condivisione dell'ambiente, l'uso dei prodotti animali, la comune cultura e i principali problemi da affrontare insieme sono le ragioni basilari della necessità di sinergia. Il lungo elenco delle avversità che hanno bisogno di sinergia ha al vertice le zoonosi (intese tanto in senso classico quanto esteso) e la sicurezza alimentare che si estende ad altri elementi connessi alla nutrizione, all'ambiente, alla coesistenza uomo/animale e alla gestione della salute pubblica; viene coinvolta la qualità della vita umana nel suo insieme. La medicina umana e veterinaria hanno una forte base culturale

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(molteplici aspetti) in comune ma purtroppo i programmi di istruzione universitaria e post laurea (salvo poche importanti eccezioni) non offrono formazione congiunta. La sinergia tra le medicine umana e veterinaria è un indicatore di "buona pratica di sanità pubblica" e perciò è necessario identificare ed eliminare ogni ostacolo alla sua realizzazione. Il logo della sanità pubblica basata sulla sinergia è rappresentato graficamente da un ombrello formato dalle attività mediche e veterinarie, che proteggono dalle potenziali avversità connesse alla salute la popolazione (consumatori e produttori), gli animali e i loro prodotti, e l'ambiente.

Parole chiave

Animale, Medicina, Sanità, Sanità pubblica, Zoonosi.

Introduction

Medicine is born as 'one'. In Figure 1, the concept of 'one medicine' is illustrated as a large tree (medicine), the trunk of which is placed on fertile soil (basic sciences); it divides into two principal branches (human medicine and veterinary medicine) that are connected to each other by a large branch (public health). Satellite branches (specialisations) derive from each of the three main branches.

Babylonian, Egyptian, Greek, Roman and Arabic healers and physicians cured both human and animal diseases. During the Middle Ages, the two medicines were separated for religious and practical reasons. The Renaissance witnessed a revival of comparative medicine. Cattle plague which occurred between the xvi and the xix centuries highlighted the value of the contributions of many outstanding physicians and other scientists. The need for specialised operators justified the establishment of veterinary schools in many countries. This emphasised and formalised the division between the two medicines and constituted an important handicap for the practice of a holistic public health. In 1948, the importance of re-bridging the division between the two encouraged the World Health Organization (WHO) to set up a veterinary public health programme, the principal function of which is to promote

collaboration between the two medicines. A strong input to synergy was obtained in 1978 when the General Assembly of the WHO in Alma Ata introduced primary health care, which required interprofessional contributions. Presently, similar input may be obtained by applying the techniques of 'evidence based prevention'. Pioneers of the concept were Bernardino Ramazzini, Giovanni Maria Lancisi, Rudolf Virchow, Louis Pasteur, Calvin Schwabe and others.



Figure 1
The 'One Medicine' tree

In this paper, the factors that explain and encourage the link between the two medicines are analysed; this is a concept that is strongly supported by the Mediterranean Zoonoses Control Programme (MZCP).

An ethical consideration

Humans (one species) and animals (many species) share the same planet and live on its resources. A partnership was established for which animals provide to humans a series of goods and facilities; humans provide a selected number of animals (the domesticated and

semi-domesticated species) what is required for their sustenance and production, while taking the authority and responsibility for the general management of the planet. Many aspects concerning the fulfilment of the ethical obligations connected with this duty are debated in the academic, political, social and religious arenas. This discussion will be limited to the professional responsibilities, even if some of the items that are presently considered 'critical' (e.g. food supply, environmental contamination and genetically modified organisms or 'GMO') will have severe consequences on the future and deserve attention that is not limited to the medical professions.

The reasons of synergy

Table I lists the products of animal origin that are enjoyed, used or consumed by humans. These are distinguished between those that are obtained directly from living animals and those which require the death of the animal. The products are food and feed, protection and production materials, work, leisure, education, etc.

Table I
Products of animal origin used by humans

Animal	Product	
From live animals	Milk	
	Blood	
	Eggs	
	Honey, wax, etc.	
	Manure	
	Work	
	Wool	
	Feathers	
	Company	
	Sport	
	Prestige	
	Education/rehabilitation	
	From dead animals	Meat and viscera
		Skin, hairs, feathers
Silk		
Bones, horns, etc.		
	Fats and oils	

The production of these items requires the sharing of a number of resources, as follows:

- foodstuffs
- water
- space (aquatic, rural, urban, wild)
- environment
- pharmaceutical products
- knowledge and technologies
- economic resources.

Without the exploitation of these resources, human life would be very difficult or would differ greatly from what it is today. Human medicine, alone, does not have the necessary competence to manage human-animal coexistence for human survival and profit. This may be achieved only by the contributions of veterinary medicine that oversee animal production.

The operational ground

The activities that require synergy between human and veterinary medicine are as follows:

- zoonoses (classical) control
- zoonoses (extended) control
- emergencies (action in)
- environmental safety
- epidemiological investigation
- food safety (including hazard analysis critical control point or HACCP)
- human nutrition
- human/animal coexistence
- professional education
- public health legislation
- public health management
- research
- urban hygiene
- use of animals for human welfare.

The list commences with zoonoses, intended both in the classical sense (only communicable agents, as defined by the WHO) and in the extended sense (any detriment to the health and/or quality of human life derived from relationships with vertebrate or edible or toxic invertebrate animals, as illustrated in Table II).

All activities connected with food safety are probably those that most need attention and collaboration. Important factors are connected to the environment, with the management of

public health and with the coexistence between humans and animals.

Table II

Non-infectious causes of detriments to human health and/or quality of human life due to relationship with animals (extended concept of zoonoses)

Origin	Cause
Allergens from	Contacts with animals
	Food of animal origin
	Pollutants of animal origin in the environment
Chemical substances in food of animal origin	Antibiotics
	Dioxins
	Hormones
	Poisons of environmental origin
	Toxins
Trauma	Bites
	Kicks
	Scratches
	Stings or contacts
Poisoning from	Snake bites
	Arthropod stings or contacts
Pollution from	Animals
	Substances of animal origin
	Arthropods and fungi of animal origin
Mediatic storm	

The following problems that require synergy illustrate why collaboration is such an important factor for the quality of human life that can be impaired if the fields connected with public health are neglected or dealt with in a disorderly fashion:

- co-infections of immunodepressed people
- environmental contamination of animal origin
- food contamination (biological, chemical and nuclear agents)
- human nutrition
- insufficient quality and quantity of food of animal origin
- coexistence of humans/animals
- management of public health

- occupational diseases (in connection with animals)
- pharmaco-resistance
- poverty (in connection with animals)
- proper use of food
- zoonoses outbreaks.

Fields covered in human and veterinary education have a common cultural background. The areas of expertise that are relevant for cooperation include the following:

- communicable diseases
- environmental protection
- epidemiology
- food hygiene
- human nutrition
- immunology
- legislation
- microbiology
- parasitology
- pharmacology
- public health
- toxicology
- zoology (noxious animals included).

It must be noted that this cultural congregation is mostly theoretical, as common activities are extremely rare, if not absent. The need for a common cultural background is even more necessary at a professional level, as the problems listed in Table II cannot be faced properly in the absence of collaboration. Recent activities of the MZCP provide valid and promising examples of training for collaboration.

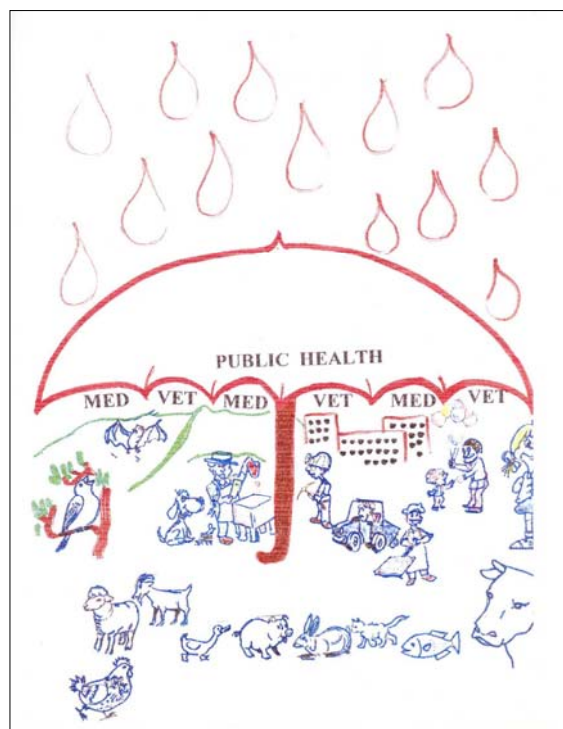
Conclusions

Synergies between the medical and veterinary sectors are indicators of 'good public health practice'. The lack of collaboration may be the norm in many cases but it is a handicap for fruitful and complete development of public health activities.

The reasons that create this problem can often be attributed to tradition (of separated professions), different cultural backgrounds, different professional languages, career development, desire for limited responsibilities, dislike of professional comparisons, superiority or inferiority complexes, economic interests and prestige.

Sometimes, the separation is aggravated by legislation and/or by administrative management. In some cases, medical and veterinary public health services ignore each other, both as official bodies and persons.

Figure 2 shows a public health scheme that is based on the holistic concept, requiring synergies. It is derived from the veterinary



Drops = risks

Biological food contamination
 Chemical food contamination
 Economic losses
 Emergencies (epidemic and not epidemic)
 Environmental contamination
 Human conflicts involving animals
 Human/animals conflicts
 Improper human nutrition
 Improper legislation
 Infections of immunocompromised people
 Nuclear food contamination
 Occupational diseases
 Pharmaco-resistance
 Poor education
 Zoonoses (classic)
 Zoonoses (extended)

Figure 2
 Veterinary public health logo

public health logo drawn by Patrizia Parodi in 2000. Public health is depicted as an umbrella formed by medical and veterinary (public health) services that protect the population (consumers and producers of all categories), the animals and their products from possible problems, as well as from possible environmental influences. The drops on the drawing represent the various risks (listed below in alphabetical order).

Figure 1 which expresses the concept of 'one medicine' at the beginning of this presentation, also symbolises the concept of 'one public health' as this is the fundamental field in which the two branches meet, combine and, in practice, should (must) cooperate.

A final consideration is that public health has minor visibility in comparison with clinical and other fields, both in the medical and veterinary sectors and this influences political and public mentalities, where public health is considered a normal routine activity (something that is 'due' and often an obligation) and attention is more focussed (as is funding) on the more 'visible' clinical activities. Attention to public health and to the connected synergic activities is highlighted during emergencies, e.g. bovine spongiform encephalopathy (BSE), avian influenza, dioxins.

It is now necessary to benefit from recent experience (not only BSE and avian influenza) to implement those synergies that are necessary for the fulfilment of public health activities.

Further reading

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