



Veterinary Public Health in Italy: From Healthy Animals to Healthy Food, Contribution to Improve Economy in Developing Countries

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Abstract

The role of the veterinarian as a public health officer is intrinsic to the history and the culture of veterinary organization in Italy. The Veterinary service being part of the Health administration since the birth of the Italian State in the XIX Century. In the second half of the last century the birth of the Italian National Health Service confirmed that the function of the Italian veterinary service was to analyze and reduce the risks for the human population connected to the relationship man-animal-environment, animal health, food safety and security. The Italian Veterinary Medicine School *curricula*, reflected this “model” of veterinarian as well. In the majority of countries in the world, Veterinary Services are organized within the Agriculture Administration with the main function to assure animal health and wellbeing. After the so-called “Mad-cow crisis” the awareness of the direct and essential role of veterinary services in the prevention of human illness has been officially recognized and in the third millennium the old concept of “one

health” and “human-animal interface” has gained popularity worldwide.

The concept of Veterinary Public Health, has evolved at International level and has incorporated the more than a century old vision of the Italian Veterinary medicine and it is defined as “the sum of the contributions to the physical, mental and social development of people through the knowledge and application of veterinary science” (WHO, Future trends in veterinary public health. Gruppo di lavoro OMS: TE, Italy, 1999, Available from: <http://www.who.int/zoonoses/vph/en/>. Last visited 16 Feb 2016, 1999).

On the subject of Cooperation, Sustainability and Public Health, the EXPO 2015 event and the activities of international organizations WHO, FAO and World Organization for Animal Health are refocusing at present their worldwide mandate to protect human health and the economy of both the poorest Countries and the developed countries, according to the “new” concept of Veterinary Public Health.

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Focus of Italian Veterinary Services activity is connected to research, diagnosis and epidemiological analysis of infectious diseases, including zoonosis, food safety as well as food security.

Keywords

Cooperation · Food safety · Food security · Public Health · Veterinary services · Zoonosis

1 Introduction

Following the studies carried out by the World Health Organization (WHO), which indicate that in 2050 the population growth on Earth will exceed 9 billion people, the Food and Agriculture Organization (FAO) and the United Nations have estimated that to meet the needs regarding availability of food, the agricultural production must be more than doubled, taking also into account economic development, with special reference to some Member States (UN 2015).

The necessary increase in food production, will have a sustainable impact on environment and on the availability of natural resources. A new approach regarding the multidisciplinary collaboration between the different actors and the fallout of the results on world population is required. Furthermore, as the population density is growing, it is important to take into account the environmental impact of migration, urbanization, pollution, limited availability of natural resources, climate change and their consequences, including health problems, such as the events related to “emerging/re-emerging” diseases, including zoonoses, food borne diseases and food safety and security. In recent years, with regard to those arguments, reference is made to the slogan “One World, One Health, One Medicine”, which today is evolving to “One Medicine, One Science” (Travis et al. 2014), and, more important, the concept of “One Health” (Sikkema and Koopmans 2016) is

accompanied by the terms “Eco health” and “Ecosystem health” (Zinsstag 2013; Zinsstag et al. 2015; One Health Eco Health Conference 2016).

In Italy, Veterinary Public Health (VPH), related to International Cooperation and contribution to the countries’ economy, is an aspect that Veterinary Medicine has taken into consideration since its beginning; the *curricula* of Veterinary Schools is based on that assumption. The concept of VPH has evolved over time, and today WHO defines it as “the sum of the contributions to physical, mental and social development of people through the knowledge and application of veterinary science” (WHO 1999).

In Italy, in 1997, Marabelli and Mantovani have defined VPH as the sum of “actions that the consumers and public administration expect from Veterinary Medicine (especially from the Veterinary State Services) for health protection, economy, environment and interrelation with animals” (Baldelli 2012).

This means that the Italian concept of VPH embraces all veterinary activities of public relevance and all the activities of Public Veterinary Services. To confirm this, it is worth considering that Veterinary Services are part of Public Health Administration, dedicated to the protection of human and animal health. In European Union, Austria is the only Member State, besides Italy, where Veterinary Services are historically part of Ministry of Health. In the other Member States, they are part of the Agriculture administration, focusing mostly on economic aspects of farms animal production.

Main purpose of VPH is Prevention and veterinary Public Health activities are meant to safeguard and promote positive man-animal-environmental relationship. The main focus relates to security and safety of food derived from animals, but research, comparative pathology, animal assisted therapy are also relevant issues dealt by the veterinary service organization. Veterinary services have to deal also with the negative aspects that might ensue, from the

sanitary point of view from the control of zoonotic agents to pest control (Donelli et al. 2004).

Activities related to VPH are considered an indicator of the state of peace and prosperity of a country, as can be inferred observing the difference existing between developing countries and developed countries in dealing with veterinary public health issues. Culture, religion, economic and social situation all play a relevant role in defining priorities and actions (Baldelli 2012).

Today the veterinary relevance in public health is widely recognized and international organizations, such as WHO, FAO and the 'World Organization for Animal Health (OIE) have emphasized the contribution of veterinary activities in Public Health, in the context of the "One Health" concept. But, it is important to take into account, that in Italy, Veterinary Public Health is the basis of the veterinary culture and organization since the inception of Italian state in the XIX century.

In the past, at international level, the concept of Public Health referred exclusively to the protection of human health, today the three organizations: FAO, WHO and OIE have defined an alliance to promote the concept of "one health" in the whole planet finally recognizing the fundamental contribution of veterinary science to the health of human beings.

The article focuses on the worldwide activities presently carried out to pursue global health, and on the importance of Italian veterinary public health concept in fostering sanitary levels not only in developed countries, but also in developing countries for a better world. In Italy this it is not a novel concept: it is the basis of the veterinary culture and of the activity of Veterinary Services since their foundation.

2 EXPO Event, Milano 2015

The theme that has been identified for Expo 2015, in Milan, was: "Feeding the Planet, Energy for Life", and if we read the "Theme

Guide", there are many arguments that put this issue in the context of globalization, food safety, food security, issues on which the Italian VPH is focused historically and it constitutes its core.

The "Expo Milan 2015 Theme" is linked to certain objectives of the United Nations Millennium Development Goals, including:

- the first: to eradicate extreme poverty and hunger, and reduce by 50%, the proportion of people throughout the world who suffer from hunger;
- the fourth: to reduce by two thirds the mortality rate in children under the age of 5 years;
- the fifth: to improve maternal health and, in particular, reduce the maternal mortality rate by three quarters;
- the seventh: to ensure environmental sustainability, in particular by supporting sustainable development policies and programmes in order to reverse the loss of environmental resources and reduce biodiversity loss;
- the eighth: to develop a global partnership for Development.

The socio-cultural approach to the Theme embraces all scientific and educational programs aimed at educating people in healthy and balanced diets that must be implemented by countries, scholastic institutions, families, businesses and civil organizations. The purpose of these programmes is to harmonize respectful relations between individuals and their environment via fair and equal access to resources by the global population, without waste or unfairness, and to promote encounters and exchanges between people with different social and cultural identities and different food traditions, that are seen as a form of intangible cultural heritage linked to language, arts and traditional jobs and crafts.

The Guide take also into account the Cooperation for a Development Approach.

The Theme, ‘Feeding the Planet, Energy for Life’ can be described as methods and tools for cooperation having the purpose to reduce hunger, malnutrition and social imbalances linked to access to food, as well as any programme aimed at distributing investments in order to obtain effective results in developing poor rural areas and urban areas in developing countries.

Partnership agreements take special relevance here because they seek to respect the roles and specific needs of the people directly involved. (Theme Guide, EXPO Milan 2015).

All the aspects highlighted by EXPO Theme Guide, refer to: “the cycle of food, linked to food safety, food security regarding all people and all social status of the population”.

The role of Veterinary Public Health is highlighted and International Cooperation must have the aim to share scientific and technical knowledge between countries.

3 FAO Contribution to Public Health

The economy of developing countries, depends on the availability of healthy animals for safe food. Animal Health ensures work capacity, food production and the access to the international market of animals and products of animal origin that are often a significant part of the Gross Domestic Product (GDP) being the economy of the Developing countries linked to agricultural production.

In some countries the economic survival of a family is dependent from the presence of few animals that are the only wealth and livelihood.

In the agricultural societies, with economy linked to agriculture, usually the poorest countries in the world, it is logical that the social and political stability is influenced by the ability to guarantee the people a minimum income and freedom from hunger.

It is scientifically demonstrates that the only remedy to war, especially in Africa, is to ensure

access to water and availability of food (Parodi et al. 2011).

Of great actuality and importance is the lecture of the FAO General Director – Graziano De Silva, in September 2015, stressing links between conflict, imperiled rural livelihoods and migration (FAO 2015).

The millions of people who are being forced to flee from war, poverty and other hardships are a tragic reminder of the urgent need for peaceful solutions based on social justice and improved economic opportunities for all. Key to achieving this is the protection of and investment in rural livelihoods.

Rural development and food security are central to the global response to the refugee crisis. War causes hunger and hunger too, kills and forces people from their homes (FAO News 2015).

Migrations for environmental causes, including food crises, will become more frequent in the near future, assuming that the migration phenomenon is definitely caused to escape hunger. In a scenario where desertification, pollution and overheating of the atmosphere threaten the survival of the African people by pushing them to a biblical exodus towards Europe, causing concerns in the Old Continent (Giordano 2015).

There is no single solution to ensure food for the entire world population, the report “The State of Food Insecurity in the World 2015 – SOFI” (FAO 2015, Hunger Report) highlights several factors that can play a key role in achieving the goal of eliminating world hunger.

Inclusive growth provides opportunities for those with meagre assets and skills, and improves the livelihoods and incomes of the poor, especially in agriculture. It is therefore among the most effective tools for fighting hunger and food insecurity, and for attaining sustainable progress.

Enhancing the productivity of resources held by smallholder family farmers, fisher folk and forest communities, and promoting their rural economic integration through well-functioning

markets, are essential elements of inclusive growth.

Social protection contributes directly to the reduction of hunger and malnutrition.

4 The Lancet Commission

The 2015 Lancet Commission on Health and Climate Change has been formed to map out the impacts of climate change, and the necessary policy responses, in order to ensure the highest attainable standards of health for populations worldwide. This Commission is multidisciplinary and international in nature, with strong collaboration between academic centers in Europe and China (Watts et al. 2015).

The central finding from the Commission's work is that tackling climate change could be the greatest global health opportunity of the twenty-first century. The key messages from the Commission are the environment, food safety and food security, water quality, air pollution, land use change, ecological change, in addition to mobility and conflict status.

It is clear that, at international level, the sources of animal origin food require the availability of qualified Veterinary Services, of well-trained biologists, and of human and material resources necessary to verify and ensure the health of animals and assistance to farmers, to reach the necessary sanitary conditions of food and also to improve the profitability of farms and agricultural production in general.

5 FAO/OIE/WHO "Tripartite Alliance – Concept Note"

In order to achieve more effective management of zoonotic and high impact diseases in the future, there is a global need to improve diagnostics, especially utilizing the new tools as genomics instruments, data analysis and risk assessment, epidemiology, social science and communication. Linking expert institutions through global networks within both the human and animal health sectors would enable new real-

time systems where methodology, data availability and responsibilities are shared both horizontally and vertically. Improved networking among countries promotes trust, transparency and cooperation. FAO, OIE and WHO are committed to working more closely together to align activities related to the human – animal – ecosystems interface in order to support Member States. The emergence of new or the re-emergence of existing animal diseases, including zoonoses, the growing threat of transboundary animal diseases, the impact of environmental changes and globalization, as well as new societal demands related to food security, food safety, public health and animal welfare, emphasize the critical need for collaboration between the three organizations.

While not a new concept, the OIE endorses the "One Health" approach as a collaborative and all-encompassing way to address, when relevant, animal and public health globally. This collaboration should not be limited to only the international level, but must be translated as a new and fundamental paradigm at national levels.

Promoting a collaborative "One Health" approach at national levels will result in a deeper and sustainable political support for the coordinated prevention of high public health and animal impact diseases at the human-animal interface.

Recent efforts in controlling emerging pandemic diseases and contributions towards pandemic preparedness have re-emphasized the need for enhanced collaboration to reduce risks of zoonotic potential including foodborne diseases and severe animal diseases at its source. Therefore, the OIE continues to insist on the critical need of constant improvement of the veterinary governance and its cooperation with public health managers and to consider all relevant activities as a global public good.

Within the framework of the Tripartite Alliance, WHO, FAO, and OIE recognize their respective responsibilities in fighting diseases, including zoonoses, that can have a serious health and economic impact. They have been working together for numerous years to prevent, detect, control and eliminate disease risks to humans originating directly or indirectly from

animals. In 2010, the [FAO/OIE/WHO Tripartite Concept Note \(April 2010\)](#) officially recognized this close collaboration, with joint strategies at the human-animal-environment interface, to support their Member Countries. Three priority areas of work were defined: zoonotic influenzas, rabies and the fight against antimicrobial resistance. (Concept Note, April 2010; FAO OIE WHO Concept Note [2010](#)).

6 The “One Health” Concept

Currently, countries are facing the occurrence of infectious diseases spreading from country to country, regardless of political borders, and this is a challenge for institutions and veterinary public health services that must identify new and more holistic control approaches (Seimenis [2008](#)).

Health experts from around the world met on September 29, 2004, for a symposium focused on the current and potential movements of diseases among human, domestic animal, and wildlife populations, organized by the Wildlife Conservation Society and hosted by The Rockefeller University.

The product, called “The Manhattan Principles” by the organizers of the “One World, One Health” event, lists 12 recommendations for establishing a more holistic approach to preventing epidemic/epizootic diseases and for maintaining ecosystem integrity for the benefit of humans, their domesticated animals, and the foundational biodiversity that supports us all (Wildlife Conservation Society [2004](#)).

It is important to note that, before, in 1964, C.W. Schwabe enunciated the concept of one medicine in Schwabe’s *Veterinary Medicine and Human Health: a unique approach for human, animal and zoonosis* (Schwabe [1964](#), [1984](#); Cardiff et al. [2008](#); Battelli and Mantovani [2011](#)).

The concept in 2004 has gained the attention at international level and One Health stands for the health of humans, animals and the environment as one entity. The interdisciplinary

cooperation creates synergies that generate added value and is the promising strategy to strengthen health systems.

During the last two decades, great concern has been expressed on the emergence and re-emergence of certain infectious diseases, among them zoonotic diseases play an important role (Meisser et al. [2011](#)), with an holistic approach recognizing that the human and others animals health is ONE and they share the same environment with reciprocal influence (Seimenis [2008](#)).

This has focused attention on the concept of emerging – reemerging diseases, most of which are zoonotic diseases, that may cause a devastating impact on humans, animals and the environment. Their emergence is influenced by socio – economic, environmental and ecological factors and their interaction must be seen as a unique system in which the different components play a different role:

- the effects of globalization on trade of animals and animal products and the need for a multi-national holistic approach;
- the role of wildlife and of environmental factors in the spread and maintenance of infections;
- the fundamental importance of the integration of veterinary and medical treatments into “one medicine” strategy and the necessity to pursue a multidisciplinary approach;
- the need for a comprehensive view over the whole production chain, following a “farm to fork” approach;
- migratory flows leading to the appearance in new territories of “old” pathogens and the discovery of “new” pathogens into newly discovered ecosystems;
- adaptation of pathogens into new hosts or into different ecological conditions;
- the ability of carriers to adapt to different environmental conditions in respect of the traditional ones.
- the importance to have diagnostic tools available to discover in “real time” the presence of microbial circulation in case of new pathogens in new territories (Lelli et al. [2011](#)).

Food security is a complex topic, often among the causes of geopolitical crises and it is essential to build up a sustainable future. However, it implies insights, and coordinated and incisive interventions at European and International level. Numerous are the connections and interdependence between the food sector – in its various aspects – and the social, cultural, geopolitical and strategic implications. Various issues are examined: land grabbing, geopolitical power, land management, biosecurity, including, in specific cases in Africa and Asia, financial aspects and migration. All, without forgetting a new approach of intelligence in the food industry to identify the limits of an integrated threat capable of adding espionage, economic competition and geopolitical ambitions (Linzi 2015).

7 European Union and Public Health

Protecting the health of humans, animals and plants at every stage of the food production process is a public health and economic priority. The European Union's (EU's) food safety policy aims to ensure that EU citizens enjoy safe and nutritious food produced from healthy plants and animals, whilst enabling the food industry — Europe's largest manufacturing and employment sector — to operate in the best possible conditions.

EU policy safeguards health along the whole 'agro-food chain' — every part of the food production process from farming to consumption — by preventing food contamination and promoting food hygiene and information, plant health and animal health and welfare.

The basic principles for the EU's food safety policy are defined in the EU's General Food Law, adopted in 2002. Its general objectives are to facilitate the free trading of food across all EU Member States by ensuring the same high level of consumer protection in all Member States (Regulation EC No 178/ 2002 European Commission).

8 Italy: An Essential Element for Public Health

Public Health concept is essential to ensure health and welfare of human and animal population, to ensure their correct integration and interrelation. Since the beginning of the slogans: "One Health", "One Health-One Medicine", "One World-One Health", "One Medicine-One Science", this concept has been endorsed internationally, and it is notable that, in some countries, including Italy, the awareness that human health, animals and environment is a unique and ancient concept. In Italy since the Renaissance, and formally in the last 100 years, the Public Health System, including Veterinary Services, was organized in line with this vision (Battelli 2014).

Improving animal health and welfare increases availability and quality of proteins for the human population and preserve farmland abandonment, ensure food safety, prevents human health problems. Therefore, the Community has to ensure the function of the official Veterinary Services "from stable to table".

Italy, recognizing the role of the official veterinarian as UNIQUE, taking into account that health and well-being of both man and animals are interrelated, has institutionalized Community official veterinary services, since 1930.

As an example, a 1934 law obliged each Municipality:

- to build a slaughterhouse as a mandatory "public health infrastructure"
- to employ Communal veterinary officers
- to care for the health and welfare of animals in the farms
- to manage slaughterhouses
- to carry out food inspection in the Municipality food retailers (Italian Law *Regio Decreto* 1934 n. 1265; Caporale 2011).

At that time all the measures to modernize and strengthen the technical structures of veterinary services were taken, to update prophylactic action focused to modern principles and proven experience, expansion and intensification of operative action in the field of the restoration of

animal diseases dangerous for human beings, the availability of more substantial financial resources to prevent or to eradicate some serious animal diseases.

This approach led rapidly to recognize, already in the middle of the XX Century that health of humans and other animals was ONE and that it was more effective and efficient to prevent diseases in animal populations, in order to protect human health, and the role of Veterinary Public Health in the field of food safety, food security and prevention of human diseases in humans, has established that the Directorate General of Veterinary Services, since its establishment, in 1946, was part of the Ministry of Health in Italy (Italian Law DPR n. 264 1961; Italian Law n. 101 1974).

In conclusion, to work at the global level, to ensure ONE Health, there is the need to developed the culture of:

- inclusion than exclusion and supremacy
- sharing of knowledge with respect to the ownership of knowledge
- organization to share knowledge than hierarchical organization

The exchange of data, field material, biological samples, diagnostic reagents and reference material allows the growth of staff skills and the scientific level of laboratories both in Italy and in countries with which collaboration and cooperation is in place.

New laboratory methods and new vaccines, by biotechnology instruments, for the prevention of diseases in animals and humans have to be developed and validated, interlaboratory tests have to be organized to assess the competences of the personnel (Caporale 2014; Caporale et al. 2009).

The contribution of the Veterinary Services to public health and poverty reduction in developing countries is increasingly a core value, to provide an appropriate contribution, as well as to ensure a sustainable future when the human population will reach the milestone of 9 billion people on Earth.

A review of University *curricula* to include ‘One Health’ precepts within a livelihoods framework should be an urgent undertaking, if veterinarians are to remain relevant to the context in which they live and work, with a holistic approach with regard to health of humans, animals and environment (Muma et al. 2014).

This should also include competence in analyzing the costs and benefits of the control strategies they institute, to assure the best response to the needs of the society. Many disease control campaigns have been conducted without a full assessment of their economic impacts both in terms of the cost of conducting the exercise, disposal, and the effects of other related non-agriculture industries such as tourism.

It will be necessary to ensure the level of food hygiene, improve production, the defense of rural farming and rural traditional productions, as they are very popular in the territories that need a contribution to the development of the economy of the Countries.

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