

A review of the One Health concept: increasing awareness and collaboration between the Maltese medical and veterinary professionals

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Abstract

The One World, One Health concept was initiated in 2004 by the Wildlife Conservation Society with the aim of establishing an interdisciplinary and cross-sectoral approach to preventing epidemic or epizootic diseases and to maintain ecosystem integrity. This concept has gained importance nowadays due to the increase in emerging and re-emerging diseases most of which are zoonotic in nature. Collaboration between the Maltese medical and veterinary professions is necessary to diagnose and control these diseases. A number of points are made questioning the current state of collaboration between these professions, with the aim of increasing the trust and communication between the said professions thus ensuring the best possible defence against diseases which can be a threat to both the human and animal population on the Maltese islands.

Keywords

Emerging diseases; Zoonoses; Collaboration; Veterinary; Medical.

Introduction

The “One World, One Health concept” was formulated by the Wildlife Conservation Society in 2004 and establishes an interdisciplinary and cross-sectoral approach to preventing epidemic or epizootic disease and for maintaining ecosystem integrity. Twelve principles known as the Manhattan principles were defined at the time, outlining the holistic approach towards these diseases.¹ A summary of these principles is given in Table 1. Building on this concept, in 2008 the FAO (United Nations Food and Agricultural Organisation), OIE (World Organisation for Animal Health), WHO (World Health Organisation), UNICEF (United Nations Children’s Fund), the World Bank and UNSIC (United Nations System Influenza Coordinator), produced a document entitled ‘Contributing to One World, One Health: a Strategic Framework for Reducing Risks of Infectious Diseases at the Animal-Human-Ecosystems Interface’ further strengthening the importance of this concept.²

Although One Health is a concept that has now been around for a decade, it has become more important in recent years and the initiative has been rapidly gaining ground. This is especially so in view of new risks to both animals and humans such as the increasing trade of commodities of animal origin within and between different countries which allows pathogens to spread quickly. Climate change also plays a part since insect vectors are being found in areas which were previously free from such vectors, due to different reasons such as raising ambient temperatures, changes in microclimate etc. These changes have led to the emergence and re-emergence of a number of diseases such as highly pathogenic Avian Influenza, West Nile fever, Ebola and sever acute respiratory syndrome (SARS).

It is estimated that about 60% of emerging infectious diseases are zoonotic in nature and around 72% of these originate in wildlife (SARS) and Ebola virus).³ These emerging infectious diseases can pose challenges in their identification and control and demand closer collaboration between medical and veterinary researchers.⁴

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Table 1: Summary of the Manhattan Principles¹

1. Recognise the link between human, domestic animal and wildlife health in the spreading of certain disease and the importance of biodiversity in maintaining healthy environments.
2. Recognise that changes in land and water use may lead to shifts in disease emergence and spread.
3. Wildlife health should be considered as an important component of global disease prevention, surveillance and control.
4. Recognise that public health programmes can contribute to conservation efforts.
5. Devise systems to facilitate the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases keeping in mind the complex interactions among species.
6. Seek ways to integrate biodiversity conservation perspectives and human needs when developing solutions to infectious disease threats.
7. Reduce the demand for and better regulate the international live wildlife and bush meat trade to protect wildlife populations and to lessen the risks of disease movement and the development of novel pathogen-host relationships.
8. Restrict the mass culling of free-ranging wildlife species for disease control to situations where there is a multidisciplinary, international scientific consensus that it poses a significant threat.
9. Increase investment in the global human and animal health infrastructure in view of the serious nature of emerging and resurging disease threats to people, domestic animals and wildlife.
10. Form collaborative relationships among governments, local people, and the private and public sectors to meet the challenges of global health and biodiversity conservation.
11. Provide adequate resources and support for global wildlife health surveillance networks that exchange disease information as part of early warning systems for the emergence and resurgence of disease threats.
12. Raise awareness and increase education so that we can better understand the relationships between health and ecosystem integrity to succeed in improving prospects for a healthier planet.

The importance of the One Health Concept

One of the challenges faced by humanity nowadays is the risk of spreading of infectious diseases that emerge due to the interactions between animals, humans and the ecosystems in which they live. This risk is on the increase due to a number of reasons mainly the exponential growth in human and livestock populations, rapid urbanisation, rapidly changing farming systems, closer integration between livestock and wildlife, forest encroachment, changes in ecosystems and the globalisation of trade in animal and animal products.² It has also been reported that some infectious diseases such as those caused by Nipah virus and Hendra virus arise due to destruction of habitat and changes in land use.⁵

Apart from the loss of human lives and livestock, major epidemics also lead to a huge economic loss. Nabarro and Wannous, 2014 reported that the six major epidemics of zoonotic disease namely Nipah virus in Malaysia; West Nile fever in the United States; SARS in numerous countries; highly pathogenic Avian Influenza (H5N1) in various countries; bovine spongiform encephalopathy in the United Kingdom, United States and Canada and Rift Valley fever in Tanzania, Kenya and Somalia, which were reported globally from 1997 to

2009, led to economic losses of around US\$80 billion excluding indirect costs.⁶

Although some animal diseases are not transmissible to humans, these can still cause public health issues especially in less developed countries since they may lead to a diminishing supply of proteins of animal origin such as meat, milk and eggs. It is estimated that by 2050 the world's population will increase by 34% reaching 9.1 billion. The great majority of this increase will occur in developing countries. Moreover, 70% of the world's population will be urban compared to 49% of today. In order to feed this increasing population, food production must increase by 70%. The annual meat production will need to rise by more than 200 million tonnes to reach 470 million tonnes.⁷ Loss of livestock either attributed directly to infectious diseases or due to culling programmes will invariably lead to hardship in these circumstances.

Recent crises such as those of highly pathogenic avian influenza (HPAI) caused by the virus A (H5N1), the influenza pandemic caused by the virus A (H1N1) and outbreaks of Ebola in West Africa have demonstrated that communication on pandemic readiness is one of the weaker points in the whole chain

of events which needs to be addressed.⁸ Even though the Maltese Islands are relatively isolated, globalisation, trade movements and climatic changes may create new risk factors both from an animal health and public health aspect. Although local wildlife may be limited on the Maltese Islands and as a result present a limited risk of harbouring and spreading disease, importation of livestock, pets and wildlife especially if brought into the country illegally may pose a risk. Animals brought into the country illegally will bypass the necessary veterinary checks envisaged by local legislation. As a result, if they happen to be carriers of a dangerous zoonotic disease, they may pose a risk to their owner and to other animals and human beings with which they come into contact.

Although the One Health concept is mainly about public health as we know it today, it touches upon a number of different and varied fields such as veterinary public health, food safety, the environment, biodiversity, climate change and also the socio-economic aspects of prevention and cure of infectious zoonotic diseases. For example, the decline in open spaces which is present in our densely populated country together with reduced interaction with nature can be a contributing factor to mental health problems as described by Maller et al, 2006.⁹ This is another important aspect when considering the broad definition of the One Health concept. Furthermore, the majority of emerging diseases in humans are zoonotic, mostly having wildlife as their origin and effecting livestock living in close contact with human beings.³ Preventing and controlling these diseases is considered as an international public good requiring commitment at national and international levels.¹⁰

The increased awareness of diseases moving from animals to humans may lead us towards trying to eliminate the contact with animals because of fear of diseases. However, due to a number of reasons, this is not possible in practice and instead we should aim towards a better understanding of how the environment can be shared safely.¹¹

The World Medical Association (WMA) in its resolution on the collaboration between Human and Veterinary Medicine adopted in October 2008, recommends the collaboration between human and veterinary medicine and supports the concept of joint educational efforts between human and veterinary medical schools. It also encourages the national medical and veterinary associations within countries to enhance collaboration in areas such as medical education and research, clinical care and public health.¹²

The main recommendations from the Global Conference on One Health held in Spain in May 2015 by the World Veterinary Association (WVA) and the WMA included the need to increase cross-disciplinary collaboration between the veterinary and medical professionals in order to improve both human and animal well-being.

This collaboration should arise at all levels i.e. students of the veterinary and medical sciences, their respective associations and also at intergovernmental organisation levels.¹³ Greater communication between these professions at all levels is required to build mutual trust and lead to better preparedness in cases of threats of emerging zoonotic diseases.

A few examples of existing One Health collaborations (being national, transnational or global partnerships) include those controlling rabies in Bali, Indonesia; controlling Q fever outbreaks in the Netherlands; the Human Animal Infections and Risk Surveillance (HAIRS) group in the United Kingdom; control of foodborne *Salmonella* in the European Union, and the tripartite collaboration formed in 2010 between the FAO, OIE and WHO listing as their main priorities the control of Rabies, zoonotic influenza and antimicrobial resistance.¹⁴ The Centre for Disease Control and Prevention of the United States of America (CDC) uses a One Health approach by working with physicians, ecologists, and veterinarians to monitor and control public health threats and learning how diseases spread among the human population, animals and also the environment.¹⁵

Conclusions

In light of the above considerations a number of questions arise regarding the current state of collaboration between the medical and veterinary professions in Malta:

- Is there adequate and efficient communication between the veterinary and medical departments with regards to food borne and zoonotic diseases?
- Are veterinary surgeons and medical general practitioners adequately informed of any new or emerging zoonotic disease which may be present on our islands? A case in point is the outbreak of Q-fever on farms detected in 2013 as described by Bonnici, 2015 in an unpublished thesis entitled “The presence of Q-fever in ruminants and small ruminants on the island of Malta and Gozo”. This is a good example of why collaboration between the veterinary and medical professions is important even locally.
- Are veterinary and medical students receiving enough training in detecting zoonotic diseases? This is especially important due to the fact that it is now easier for example, for pets and livestock to travel in the European Union and the veterinarian might be the first person to identify or suspect a zoonotic disease such as rabies or brucellosis. Fortunately Malta has been free from Rabies since 1911 and the last major outbreak of Brucellosis was in 1996.¹⁶ We must therefore ensure that all checks are in place to maintain freedom from these diseases.

- Is there sharing of information between the veterinary surgeon treating an animal suffering from a zoonotic disease and the medical practitioner of the owner of the animal, since they may also be at risk?
- Likewise, do medical practitioners share information with veterinarians when they suspect that a zoonotic disease may have been transmitted from the owner's pet?
- Are there systems in place whereby notification of zoonotic diseases can be shared by both the veterinary and medical profession easily and rapidly?
- Should working groups from the Maltese veterinary and medical professions, via their respective associations, be organised to tackle the points mentioned above?

It is not only the medical and veterinary profession who should be involved in the One Health concept. Morner, Fishcher and Bengis, 2014, report that several non-governmental organisations (NGOs) which are involved with the study and care of wildlife can also collaborate in the One Health concept through disease monitoring and assisting in field studies, since in many cases their members have very good knowledge of the local environment. They are also involved in educating their members and the public in general.¹⁷ Local examples of such NGOs include BirdLife Malta and Nature Trust Malta. Communication between veterinarians working in the veterinary public health sector and medical professionals dealing with public health is very important. Effective communication at this level is the first step towards increasing the collaboration between the two professions thus limiting the risk of introduction and spread of epidemic or epizootic diseases on the Maltese islands.

References

1. Wildlife Conservation Society. One World - One Health [updated 2004; cited July 2015]. Available from: <http://www.wcs.org/conservation-challenges/wildlife-health/wildlife-humans-and-livestock/one-world-one-health.aspx>.
2. FAO, OIE, WHO, UNSIC, UNICEF, The World Bank. Contributing to One World, One Health: A Strategic Framework for Reducing Risks of Infectious diseases at the Animal-Human-Ecosystem Interface 2008.
3. Jones K, Patel N, Levy M, Storeygard A, Balk D, Gittleman J, Daszak P. Global Trends in Emerging Infectious Diseases. *Nature* 2008;451(21):990-994.
4. Taylor L, Latham S, Woolhouse M. Risk factors for human disease emergence. *Philosophical Transactions - Royal Society. Biological Sciences* 2001; 356(1411):983-989.
5. McConnell I. One health in the context of medical and veterinary education. *Scientific and Technical Review* 2014;33(2):651-657.
6. Nabarro D, Wannous C. The potential contribution of livestock to food and nutrition security: the application of the One Health approach in livestock policy and practice. *Scientific and Technical Review* 2014;33(2):475-485.
7. FAO. How to feed the world in 2050 [updated 2009; cited July 2015]. Available from: http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf.
8. European Union External Action. Health [updated 2015; cited July 2015] available from: <http://www.eeas.europa.eu/health/>.
9. Maller C, Townsend M, Pryor A, Brown P, St. Leger L. Healthy nature health people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promotion International* 2006;21(1):45-54.
10. Nuttall I, Miyagishima K, Roth C, de La Rocque S. The United Nations and One Health: the International Health Regulations (2005) and global health security. *Scientific and Technical Review* 2014;33(2):659-668.
11. Decker D, Leong K, Evensen D. Perceptions of wildlife-associated disease risk: a challenge or opportunity for "One Health" in national parks? *Proc. 2009 George Wright Society Conference Michigan* 2009;101-106.
12. World Medical Association (WMA). World Medical Association Resolution on Collaboration between Human and Veterinary medicine [updated 2008; cited July 2015]. Available from: <http://www.wma.net/en/30publications/10policies/v2/index.html>.
13. World Veterinary Association/World Medical Association. WVA/WMA Global Conference on One Health, Drivers towards One Health, Strengthening collaboration between Physicians and Veterinarians. Madrid [updated 2015; cited August 2015]. Available from: http://www.worldvet.org/uploads/news/docs/gcoh_report_may_2015.pdf.
14. Vandersmissen A, Welburn S. Current initiatives in One Health: consolidating the One Health Global Network. *Scientific and Technical Review* 2014;33(2):421-432.
15. Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, One Health [updated 2013; cited July 2015]. Available from: <http://www.cdc.gov/onehealth/index.html>.
16. World Organisation for Animal Health. World Animal Health Information Database (WAHID) Interface. [updated 2014; cited August 2015]. Available from: http://www.oie.int/wahis_2/public/wahid.php/Countryinformation/Animalsituation.
17. Morner T, Fischer J, Bengis R. The value of increasing the role of private individuals and organisations in One Health. *Scientific and Technical Review* 2014;33(3):605-613.