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Short Communication

EMERGING ZOONOSES: THE PUBLIC HEALTH ROLE OF VETERINARIANS

BABALOBI, O.O.

Department of Veterinary Public Health and Preventive Medicine, Faculty of Veterinary Medicine, University of Ibadan, Ibadan, Nigeria

.Correspondence: E-mail: oo.babalobi@mail.ui.edu.nig Telephone: 234-805-530-1991

INTRODUCTION

In the face of increased emerging human zoonotic diseases in the past 10 years, (75% being of animal origin), the pertinent and indispensable role of veterinarians in the multidisciplinary field of public health, is refocused. Veterinarians are a unique professional resource in the identification, diagnosis, prevention, control and surveillance of these emerging zoonotic diseases. Improving the cooperation between human health and animal health sectors is identified as being the key prerogative in the control of emerging zoonoses, whether at national, regional or international levels. A new integrative *"One Medicine" approach, also known as the "Manhattan Principles" by the organizers of a "One World, One Health" symposium, has developed and is being adopted by national and international public health organizations.* Faculties/Schools of Veterinary Medicine also need to prepare their graduates to do more than "simply treat animal diseases". Core courses in veterinary epidemiology, public health, and preventive medicine are pivotal to maintaining interest in this career pathway and must be included in the curriculum. Public Health Veterinarians in Nigeria are poised to respond to the challenge of recurrent and emerging zoonoses, with the recent approval for the resuscitation of the National Zoonoses Center at the Department of Veterinary Public Health and Preventive Medicine, University of Ibadan. An appropriate review and strengthening of the Animal Disease Control Act (Decree 10) of 1988, in the light of present universal public health realities, is also a necessary perquisite.

KEY WORDS: Public Health, Emerging zoonoses, Role of veterinarians

ZOONOSES

Zoonoses are diseases and/or infections which are *"transmissible from vertebrate animals to man"*. Over 200 zoonoses have been described and they are known for many centuries. They involve all types of agents: bacteria, parasites, viruses and unconventional agents (http://www.who.int/zoonoses/en/). About 75% of the new diseases that have affected humans over the past 10 years have been zoonotic, caused by pathogens originating from an animal or from products of animal origin. Many of these diseases have the potential to spread through various means over long distances and to become global problems (http://www.who.int/zoonoses/vph/en/). The WHO/FAO/OIE joint consultation on emerging zoonotic diseases held in Geneva, 3-5 May 2004, defined **Emerging Zoonoses** as *"a zoonosis that is newly recognized or newly evolved, or that has occurred previously but shows an increase in incidence or expansion in geographical, host or vector range (http://www.who.int/entity/zoonoses/en)*. The broad definition of an emerging infectious pathogen used by the US Centers for Disease Control and Prevention is one *'whose incidence in humans has increased within the past two decades or threatens to increase in the near future* (Lederberg *et al.,* 1992), but it was suggested over 10 years ago that emerging pathogens were very frequently zoonotic (Morse, 1995). More recent work has confirmed that as many as 60% of the more than 1400 recognised human pathogens jump between species (Woolhouse and Gowtage-Sequeria, 2005).

Over several decades, there has been one new emerging disease each year, and approximately 75% of these diseases have been zoonotic (King,

2004). Emerging zoonotic diseases have potentially serious human health and economic impacts and their current upwards trends are likely to continue. Examples are Avian influenza, Bovine Spongiform Encephalitis ((BSE) - the Mad Cow disease- ,Marburg hemorrhagic fever, Ebola virus disease, West Nile virus, Rift Valley Fever and the Nipah virus. Some of the "lingering" zoonoses are re-emerging in some regions, although they seem to attract less public awareness. Examples of the lingering zoonoses are Brucellosis, Bovine tuberculosis (which predisposes to HIV/AIDS), Leptospirosis (in dog-which has recorded increased incidence), Hantavirus (mice), salmonella (chicken), E. coli (cattle), Newcastle disease (wild and domesticated birds), toxoplasmosis (cats), giardiasis (beaver fever), trichinosis (swine), neuro-cysticercosis (swine), echinococcosis/ hydatidosis and rabies(dogs/bats) (http://www.who.int/zoonoses/emerging_zoonoses/en/).

PUBLIC HEALTH

Public health is the field of medicine and hygiene dealing with *the prevention of disease in humans and the promotion of human community health by government agencies*. It is an extremely large, multi-disciplinary field with many professions working together to safeguard and improve the health of people worldwide (The Columbia University Encyclopedia, 2003). **Veterinary Public Health** (VPH) is *"the contributions to the physical, mental and social well being of humans through the understanding and application of Veterinary Science"* (FAO/WHO/OIE 2001*www.fao.org/ag/aga/agah/VPHeconf/home.htm)*. Veterinarians are a unique professional resource, as they are the only health professionals trained in multi-species comparative medicine. As a result of this training, the veterinary profession is able to provide an extraordinary link between agriculture and human medicine (Hoblet *et al* 2003). The uses made of this link have been extensive, with multiple benefits to society. In fact, public support for veterinary medical education has, as its historical basis, the profession's relationship with food production and the control of zoonotic diseases. In addition to traditional research involving production animals and biomedical research using animal models, veterinarians have a distinct advantage because of their understanding of species epidemiology and the ecology of zoonotic infections (Hoblet *et al* 2003). The Public Health veterinarian provides overall veterinary epidemiological and surveillance direction to community based zoonotic programs, is an important linkage to the medical community and the public at large in the areas of emerging diseases and bio-terrorism. Responsibilities include Disease surveillance, Enforcing Public Health Laws, Meat Hygiene and Safety Coordination, Extension Education & Prevention Services, Environmental Health Leadership, Research, Teaching and Professional Training, Technical Support and Education, Public Communications, Program Planning and Evaluation. This position also requires:

1. Diagnostic skill and judgment required to provide reliable advice to veterinarians and others regarding infectious diseases and other symptoms.
2. Knowledge of epidemiological practices; Ability to develop and deliver meaningful and effective disease prevention educational programs to the public.
3. Knowledge of environmental laws and applicable health codes.
4. Knowledge of pathology techniques, principles and procedures.
5. Knowledge of epidemiology, zoonotic disease surveillance and control and environmental health practices. (Public Health Veterinarian, http://www.metrokc.gov/ohrm/psd/openings.html)

VETERINARIANS AND ZOONOSES

A World Health Organization (WHO) publication of 2002 study group report describes the increasing emergence and reemergence of zoonotic diseases in the 1980s and 1990s and their importance for global public health. To effectively meet these challenges, human and animal health issues must be merged into a new public health agenda. Creating and responding to such an agenda depends on strong interactions between the human and veterinary clinical, laboratory, and public health professional organizations. These interactions are essential for developing new and

strengthening existing partnerships necessary for implementing effective public health programs. (WHO, 2002).

THE MANHATTAN PRINCIPLES: (ONE MEDICINE PANACEA TO ANIMAL ZOONOTIC DISEASES).

Health experts from around the World met on 29 Sep 2004 for a symposium organized by the New York-based Wildlife Conservation Society and hosted by Rockefeller University. Focusing on the current and potential movements of diseases among human, domestic animal, and wildlife populations and using case studies on Ebola, avian influenza, and chronic wasting disease as examples, the assembled expert panelists delineated priorities for an international, interdisciplinary approach for combating threats to the health of life on Earth. The product of the symposium, called the "Manhattan Principles" by the organizers of the "One World, One Health" event, focuses on 12 recommendations for *establishing a more holistic approach to preventing epidemic/epizootic disease and for maintaining ecosystem integrity for the benefit of humans, their domesticated animals, and the foundational biodiversity that supports us all.* Participants urge the world's leaders, civil society, the global health community and institutions of science to among others " *Recognize the essential link between human, domestic animal and wildlife health and the threat disease poses to people, their food supplies and economies, and the biodiversity essential to maintaining the healthy environments and functioning ecosystems we all require*"; concluding:- *"Solving today's threats and tomorrow's problems cannot be accomplished with yesterday's approaches. We are in an era of "One World, One Health" and we must devise adaptive, forward-looking and multidisciplinary solutions to the challenges that undoubtedly lie ahead"* (Cook *et al.*, 2005< http://www.oneworldonehealth.org>).

This comparative medicine concept has been upheld by American public health personnel in tackling the issue of emerging zoonoses. Ole Nielsen, a veterinary pathologist and a retired educator who has been dean of the veterinary colleges at the University of Saskatchewan and the University of Guelph and is chair of the Alberta Veterinary Medicine Steering Committee, was quoted as saying, *"SARS is a good example of comparative medicine. When you're trying to deal with disease and prevention, a comparative approach is a powerful way to understand disease phenomena." Doctors were able to get a handle on SARS very quickly because there was a tremendous body of basic knowledge about the corona virus in the literature of animal medicine.* (Powell 2005a)

Developing a new integrative "one medicine" approach, which combines the resources of *public health, veterinary medicine (more specifically zoonoses), and environmental epidemiology/epizootiology*, to Foreign Animal and Zoonotic Diseases (FAZD), has been recognized as the major approach to meeting the challenge of emerging zoonotic diseases- diseases transmitted to humans from animals. This approach is one of agenda of a USA National Conference on establishing an "Academic Network on Foreign Animal and Zoonotic Disease.", organized by the Department of Homeland Security's National Center for Foreign Animal and Zoonotic Diseases Defense (Powell 2005b).

The first "International Symposium on Emerging Zoonoses Medical and Veterinary Partnerships to address global challenges" was held in Atlanta, Georgia (USA) from 22-24 March 2006. The Symposium was co-organized by Centers for Disease Control and Prevention (CDC) and the World Organization for Animal Health (OIE) with the strong support of the Food and Agriculture Organization of the United Nations (FAO) and of other international and national sponsors, as well as with the participation of the World Health Organization (WHO). The Symposium brought together public health and animal health professionals to strengthen the development of effective and co-operative partnerships to face of new microbial threats. As the first ever collaborative event between CDC and OIE, the meeting registered the very successful participation of over 400 attendees, representing the medical and veterinary community. While addressing the convergence of human and animal health, the threats and challenges facing human and animal health, and control and prevention strategies, the lessons learned from the past and the opportunities for the future as well as the risk

management and communication, the commitment to improving the cooperation between human health and animal health sectors was identified as being the key prerogative in the control of emerging zoonoses, whether at international, regional or national level. (OIE Press Release Updated: 10-April-2006, http://www.oie.int/eng/press/en_060328.htm.)

Recognizing the role of Veterinarians in the Public Health Workforce, **The American Public Health Association,** reaffirmed APHA policy on the "Utilization of Doctors of Veterinary Medicine in Public Health" urging that the "services of doctors of veterinary medicine be made available to health departments. The APHA listed 15 reasons to support this call and made 7 recommendations *"to understand and support the role of veterinarians in public health"*

(AMERICAN PUBLIC HEALTH ASSOCIATION 2001 www.apha.org/legislative/policy/01_policy.pdf).

As Veterinary Services and animal health organisations attempt to respond to a new era of emerging and re-emerging zoonotic diseases, their ability and skill in forming new strategic partnerships will be paramount. While these new partnerships are likely to include many relationships outside traditional Veterinary Services and animal agriculture, none will become more important than the formation of new animal health and public health partnerships (King *et al.*, 2004).

CONCLUSION:

THE NIGERIAN SITUATION

Issues such as food safety, public health and zoonoses are not merely the concern of individual states but are of national, and even global, importance (Hoblet *et al* 2003). Public Health Veterinarians in Nigeria are poised to respond to the challenge of recurrent and emerging zoonoses, with the recent approval for the resuscitation of the National Zoonoses Center at the Department of Veterinary Public Health and Preventive Medicine, University of Ibadan, by the National Council on Agriculture. The 'One Medicine' collaborative approach with relevant health disciplines will be a basic strategy. An appropriate review and strengthening of the Animal Disease Control Act (Decree 10) of 1988, in the light of present universal public health realities, is a necessary perquisite in this regard.

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