EMERGING AND RE-EMERGING ZOONOTIC DISEASES: 
CHALLENGES AND OPPORTUNITIES

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Summary: There are a number of factors and driving forces that have converged to create a new era of emerging and re-emerging diseases. This era is likely to continue for some time with profound implications for both human and animal health. Because approximately 75% of the new emerging human diseases over the last several decades are zoonotic, this era is also characterized by a greater convergence of animal and public health programs, officials, and organizations. This growing interdependence presents animal health officials and the OIE with significant challenges and opportunities. The responses to a recent questionnaire distributed to OIE Member Countries revealed that animal health officials worldwide are experiencing more emerging and re-emerging diseases; finding more antimicrobial-resistant pathogens; experiencing a growing number of factors that will ensure future zoonoses; and are increasingly concerned about the introduction or re-emergence of zoonotic pathogens either through natural or intentional means. Clearly, OIE Member Countries are anticipating a closer working relationship with their public health counterparts and many are organizing to become more collaborative. The responses to the questionnaire also indicated an almost unanimous support for the OIE to both become more engaged in training and educational programs for emerging and re-emerging zoonotic diseases, and to create an ad hoc group to address the contemporary and global issues created by these diseases and the growing need for more attention to surveillance, detection, response, and prevention strategies.

1. INTRODUCTION

As OIE Members gather for the organization's 72nd General Session, they likely confront more challenges and opportunities than at any time in the organization's history. The driving forces of globalization, technology, restructuring of agricultural systems, consumerism, and contemporary societal issues are propelling us into the 21st century with unprecedented speed and added complexity. The impact of these forces will unquestionably change the basic foundation and operations of animal health and how it must consider and prepare for the future. Central to the profound changes for animal health is both the recognition of a new era of emerging and re-emerging diseases, and the significant impact of these diseases on the public health and well-being.

The confluence of human and animal health is not a new phenomenon for veterinarians and animal health officials; however, the scope, scale, and worldwide impact of zoonoses today has no historical precedent. The purpose of the OIE Technical Item I is to discuss the factors that have created this new era; the challenges of emerging and re-emerging zoonoses; the potential responses and perspectives of Member Countries; and the remarkable opportunities that are now presented to OIE members, animal health officials, and the OIE itself.
2. FACTORS OF EMERGENCE AND RE-EMERGENCE

The spectrum of microbial threats is a continuum that comprises the emergence of newly recognized infectious diseases, the resurgence of endemic diseases, the appearance of newly adapted forms of pathogens such as antimicrobial resistant, and the intentional use of biological agents for harm to both animal and human populations.

The emergence, re-emergence, and spread of microbial threats are driven by a complex set of factors. The convergence of any number of these factors can create an environment in which infectious diseases can emerge and be maintained in society. The increasing interaction of domestic animals, wildlife, and humans is a critical and progressively important factor within the dynamic of emerging diseases and the transmission of zoonotic pathogens.

A convergence model is presented below to help conceptualize how factors of emergence converge and alter the animal-human-microbe interface and then produce and transmit infectious diseases. An emerging disease is defined as a new infection resulting from the evolution or change of an existing pathogen or parasite resulting in a change of host range, vector, pathogenicity or strain; or the occurrence of a previously unrecognized infection or disease. A re-emerging disease is considered a known or endemic disease that either shifts its geographical setting or expands its host range, or significantly increases its prevalence.

The convergence model organizes the potential factors into a series of broad domains that include (1) socioeconomic and biological factors; (2) ecological and environmental factors; and (3) the interface of domestic animals, wildlife, and human factors. The specific factors of emergence are all contained within these domains and collectively form a complex, ever-changing milieu that, in turn, helps alter the animal-human-microbe dynamic. The critical factors consist of microbial adaptation and change; host susceptibility; climate and weather; changing ecosystems, demographics, and populations, including issues of wildlife and exotic animals; economic development and land use; international trade and travel; technology and industry; reduction in animal and public health services or infrastructure; poverty and social inequity; war and dislocation; lack of political will; and intent to harm (7).
3. ADAPTATION

Microbes are especially competent at adaptation and change under selective pressures for survival and replication. The remarkable adaptation of microbes to become resistant to antimicrobial products is seen in both human and animal populations and is linked between the two. For example, a type of *S. Newport* primarily in the U.S. has been found in cattle, equine, and human populations and is resistant to 9 different commonly occurring antibiotics. *S. typhimurium* DT104 was once described as a super bug that had adapted as an antimicrobial resistant pathogen with global distribution in both domestic animals and human populations (6).

The influenza virus is also renowned for its ability to evolve so that new strains emerge annually, giving rise to yearly epidemics in avian and human populations. Many pathogens have developed novel mechanisms to exchange or incorporate new genetic material into their genomes that can alter their survivability and virulence. Other microbes cleverly are capable of defending themselves or escaping from immune systems, which further demonstrates their extraordinary ability for adaptation.

4. HOST SUSCEPTIBILITY

As human populations increase, two groups of hosts with impaired immune systems are emerging. In developed countries, advances in medicine, science, and technology have led to an increase in the number of people who are immunocompromised. Cancer patients and transplant patients are examples. The staggering increase in AIDS1 and HIV2 infections worldwide has led to increases in zoonoses and re-emergence of latent infections. Concurrently, in a number of these countries, the fastest-growing cohort of the population are individuals over the age of 60 years. This population will likely have increasing susceptibility to food- and water-borne pathogens and zoonoses, and will possibly endure a resurgence of childhood diseases. Because the world population growth will grow disproportionately more rapidly in less developed countries, infectious disease agents will continue to take their toll. Host susceptibility to infection is aggravated by malnutrition. In parts of the world where livestock and poultry production systems are growing rapidly, a progressively larger number of animals are confined closer together, which favors pathogen dissemination. In production systems where animals have been reared for maximal production performance, huge pristine populations of genetically similar animals are especially susceptible to introductions of novel pathogens.

5. CLIMATE AND WEATHER

Although the spread of disease is multicausal, global climate change may be a significant contributor. Weather and climate can influence host defenses, vectors, pathogens, and habitats. There is a growing body of data that demonstrates the impact of weather on infectious disease. Ross River virus is a mosquito-borne disease found throughout Australia, and outbreaks are sensitive to excessive rainfall events. Malaria and dengue fever are two other mosquito-borne diseases that are likely to spread dramatically with global warming. Global warming may help expand the distribution of other vector- and water-borne diseases such as yellow fever and cholera. El Niño/Southern Oscillation (ENSO) is a climate process that produces changing patterns for rainfall and drought, which, in turn, have influenced vector and host populations and disease. Outbreaks of Hantavirus Pulmonary Syndrome (HPS) have been exacerbated by the ENSO phenomenon. Small rodent and tick populations are sensitive to climatic changes. Recent outbreaks of HPS in the Americas have been clearly associated with the effects of ENSO on these populations and the subsequent increased human exposures. In addition, leptospirosis and Rift Valley fever are zoonotic pathogens sensitive to weather and climate changes and they have been found in a variety of epidemics worldwide over the last decade (3).

6. CHANGING ECOSYSTEMS

Ecological and environmental conditions also help determine the epidemic potential of emerging zoonoses. The emergence of Sin Nombre virus and other hantaviral agents offers an excellent example. Hanta viruses are found worldwide and are transmitted from rodents via dried excretion to humans. Rodent populations and hanta virus

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1 AIDS: acquired immune deficiency syndrome
2 HIV: human immunodeficiency virus
infections vary temporally and spatially. When environmental conditions are favorable, rodent populations, as well as the associated prevalence of human diseases, can increase dramatically. Epidemics of plague, tularemia, and typhus have all occurred in recent years and are also reminders of the potential for zoonotic epidemics should the ecological dynamics between animals and people be advantageous.

Since the mid-1970s more than 20 tick-borne infectious diseases have been newly identified in humans. These emerging diseases have animal reservoirs and, for a variety of reasons, people are increasingly becoming exposed to tick vectors and associated pathogens. Lyme disease, for example, has progressed from a virtually unknown problem to a clinically significant endemic disease in certain parts of the world, including the United States of America, Europe, and Asia. In the United States of America, Lyme disease is caused by the spirochete *Borrelia burgdorferi* that is transmitted by *Ixodes* ticks and involves rodents and white-tailed deer populations. The emergence of Lyme disease in the United States of America is primarily because of favorable ecological conditions that have greatly increased deer populations, especially where farmland in the Northeast and Midwest United States of America has been reforested. Temperature, vegetation, and rodent populations also play a key role in the ecology and dynamics of this disease (9).

7. POPULATION GROWTH

The world's population quadrupled in the last century (United Nations) and increases by 80 to 100 million people each year. At the same time, the global population is aging at an unprecedented rate. In addition, there has been a mass relocation of rural populations to urban areas, which has been one of the most important demographic trends in the latter part of the 20th century. According to the United Nations, the world's urban population was 2.9 billion in 2000 and is expected to reach 5 billion by 2030. The interactions of these changing and growing populations with animals and animal products are also increasing in an unprecedented manner, and the prospect of the appearance of emerging and reemerging zoonoses continues to be an outcome (10).

8. GLOBALIZATION

The phenomenon of globalization has been one of the most remarkable changes in our lives over the last quarter of a century. Globalization has been the driving force that has profoundly impacted international trade, economics, and cultural interactions. The spatial mobility of the average human has increased more than 1,000-fold since 1800. At the turn of this century almost 700 million people travelled internationally and this number is expected to reach 1 billion by 2010 (2). Not only are more people travelling, but travel is faster and more culturally widespread and permeates into areas of the world not readily accessible in the past. People, animals, and products can circumvent the globe faster than the incubation period of almost every pathogen known today.

During 2003, the United States of America experienced concurrent infections of SARS3, West Nile virus, and monkeypox. None of these zoonotic pathogens had ever been found within the United States of America borders before this new era. The spread of influenza viruses is a global phenomenon found in human, animal, and avian populations, sometimes independently and sometimes as a result of their interactions. Most infectious disease experts believe that we await the next major influenza pandemic, and it will almost certainly be defined by a genetic transfer involving multiple species.

Food-borne illnesses continue to be a major factor in infectious disease epidemiology. More than 200 food-transmitted diseases are known today (1). The expansion of the global trade of food products over the last few decades has ushered in an era where there has been a significant increase in the scope and range of food-borne illnesses. The total meat (beef, pork, and poultry) exports worldwide for 2004 is estimated to be 17.7 million tons (4), which is an increase of approximately 5 per cent from 2003. The food system is complex and global, and provides another opportunity for the movement of pathogens into new hosts and populations.

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3 SARS: severe acute respiratory syndrome
9. MULTI-HOST PATHOGENS

The ability of pathogens to cross species and infect multiple hosts is an ingenious adaptation that also favors their survival. It is estimated that up to 60% of human pathogens are found in multiple species and, perhaps, up to 80% of animal pathogens are capable of infecting other species of animals. As our human populations grow and domestic and wildlife populations increase, the interactions among them also increase; thus, we are likely to experience more pathogens crossing species lines. Bovine spongiform encephalopathy (BSE), Nipah virus, SARS, and Type A Influenzas have been highly publicized and scrutinized in their abilities to leap from animal hosts to humans with profound consequences.

In an individual microbe's world, its ecological milieu is limited only by the microbe's mobility and its ability to adapt and tolerate various factors in its existence. Wherever the conditions are favorable, it will eagerly take hold and help create and redefine a new ecological niche and potentially alter the dynamic of hosts and vectors that share this niche. Laurie Garrett once said that, “The planet is nothing but a crazy quilt of micro-ecosystems scattered and forever changing over its 196,938,800 square-mile surface” (5).

Microbes are engaged in a constant competition; they evolve, adapt, swap genes, and undergo endless experiments to gain a survival advantage. As our world populations increase and expand and our potential exposure experiences with microbes and new hosts increase, the ecological balance certainly favors the survival and domination of microbes and emerging zoonoses.

10. WILDLIFE

Wildlife can be an important source in the transmission of infectious diseases to both domestic animals and humans. With expanding human populations, recreational interests, and changes in our ecosystems and wildlife habitat, there is a greater interface among these groups; yet, there also seems to be a lack of knowledge about diseases in wildlife populations and often a lack of disease prevention and management strategies for wildlife.

Several trends in the wild are also contributing to the growing occurrence and importance of zoonotic diseases. The spectrum of infectious diseases affecting wildlife today is greater than at any time during the last century. Infectious diseases are also causing major outbreaks and losses in wildlife as opposed to the sporadic or self-limited outbreaks often seen in the past. Finally, disease emergence has occurred on a global scale in a broad spectrum of wildlife species and habitats (1).

Wildlife translocation, in which humans move wildlife from one geographic site to another, is a common conservation tool but also a practice that has facilitated the emergence of zoonoses. In the United States of America, the translocation of raccoons from Southeast United States to the Mid-Atlantic States and New England produced a new enzootic foci for raccoon rabies. Rabies has also been translocated with foxes and coyotes moved for sporting reasons.

Bovine tuberculosis in Kruger National Park in South Africa, the spread of distemper in wild dogs and lions of the Serengeti, and toxoplasmosis in seals off the coast of California in the United States of America all represent emerging diseases in which the pathogen has shifted from domestic animals to wildlife with devastating results (8).

Most human emerging diseases result from exposure to zoonotic pathogens via natural transmission between animals and humans. Wildlife may provide a ‘zoonotic pool’ from which previously unknown pathogens may emerge. Transmission occurs due to distinct emergence events that may occur directly from a primary reservoir or via secondary or tertiary intermediate hosts. For example, Hendra, Menangle, and Nipah viruses have involved fruit bats as carriers and/or hosts of this high-profile group of emerging diseases.

The emergence of the SARS virus appears to have originated from an animal(s) source in China. The mixing of people and animals in exotic, live-animal markets is viewed by some experts as the triggering event of this epidemic.

The growing involvement of wildlife and emerging zoonoses has several serious implications. Wildlife populations can be the reservoir for pathogens that threaten animal and human health, and wildlife diseases pose a substantial threat to the conservation of global diversity.
11. CHALLENGES AND OPPORTUNITIES

Infectious zoonotic diseases are a continuing threat to our animal and human populations worldwide. They produce suffering and death and impose enormous financial burdens on society. Some countries have made significant advances in the prevention and control of these diseases, while others continue to struggle. Yet, all nations are now threatened by emerging zoonoses and the re-emergence of old pathogens in different locations, and often in different forms.

While zoonotic diseases have always been a part of our lives, the convergence of animal and human health over the last two decades and the creation of new emerging and re-emerging pathogens has been unprecedented. The mingling of animals, both domestic and wildlife, animal products, and people has created a microbial milieu that not only favors the emergence of zoonoses, but suggests that this era of emerging and re-emerging zoonoses will likely continue unabated.

Responding to the critical and contemporary needs of society, countering and preventing new threats, and improving both animal and public health are 21st-century goals for veterinary medicine. The modern convergence of animal and human health is creating profound threats and opportunities, but the greatest threat may very well be deciding on the status quo. The threat will continue to be extensive morbidity and mortality in both animal and human populations, disruption of global trade, and financial burdens to healthcare systems and agricultural production systems.

If the factors and driving forces that are producing the significant emergence and re-emergence of zoonotic diseases remain in place, then we will experience the continuation, and perhaps even the acceleration, of zoonotic pathogens and their global dissemination. There is currently nothing on the horizon that would suggest that emerging zoonoses will magically decline. Thus, the role of veterinary medicine and animal health must change to respond to these serious health issues.

How we work, where we work, what we work on, and our skills and competencies are all being called into question. Is the veterinary profession capable of responding to these contemporary threats? Can it work more collaboratively, more globally, more scientifically, and more effectively? The extension of these questions logically can be asked of the OIE and its Member Countries. Should the OIE help address global zoonotic diseases, especially with regard to the public health needs of its Member Countries?

A critical difference in the response to emerging and re-emerging zoonotic diseases will be the need for partnerships and collaboration. The complexity of human-animal relationships illustrates that our future will be characterized by a new interdependence, and true progress on the prevention and control of zoonotic diseases can only be achieved through collaborative ventures between animal health and public health and a new global strategy of cooperation.

12. QUESTIONNAIRE

The questionnaire that was distributed to OIE Member Countries was designed to help assess the occurrence of emerging and re-emerging zoonotic diseases; Member Country's ability to respond, prevent, and control such diseases; and the level of preparation of countries to confront emerging zoonoses based on their capacity, partnerships, research, and studies. The results of the questionnaire then help serve as data points from which the OIE can devise appropriate recommendations and strategies. The questionnaire was sent to 164 Member Countries and 90 responses were received. The following countries responded to the questionnaire: Afghanistan, Albania, Algeria, Andorra, Argentina, Armenia, Australia, Austria, Belarus, Belgium, Belize, Benin, Bosnia and Herzegovina, Botswana, Brazil, Burkina Faso, Cameroon, Canada, Chinese Taipei, Costa Rica, Cote d’Ivoire, Croatia, Cyprus, Czech Republic, Democratic Republic of Congo, Denmark, Ecuador, Egypt, Eritrea, Estonia, Finland, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Kuwait, Kyrgyz Republic, Latvia, Luxembourg, Mali, Malta, Mauritius, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Caledonia, New Zealand, Nicaragua, Nigeria, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Senegal, Serbia and Montenegro, Slovak Republic, Slovenia, Spain, Sudan, Sweden, Switzerland, Syria, Thailand, Togo, Tunisia, Uganda, Ukraine, United Kingdom, United States, Uruguay, Vanuatu, Vietnam, and Zimbabwe.
13. FACTORS OF EMERGENCE AND RE-EMERGENCE

Responding country officials identified microbial adaptation, climatic conditions, international travel, and globalization and trade as the most common events that were contributing to the emergence and re-emergence of zoonotic diseases. Changing host susceptibility and changing ecosystems were also listed as important emergence factors by slightly less than half the respondents; economic development and technology were listed by 32% and 20%, respectively; and intentional introduction was noted by 18% of the respondents. Clearly, the most common factors of globalization—international travel, climatic changes, and microbial adaptation—are likely to only intensify with today's growing populations and increased travel and trade. Results of this questionnaire also emphasize that the factors of emergence and re-emergence are fundamentally due to anthropogenic influences, and that the essential factors remain in place that will ensure the continuation of this new infectious zoonotic disease era well into the future.

14. IDENTIFICATION, RESPONSE SYSTEMS, AND DISEASE REPORTING

Approximately 55% of OIE Member Countries reported that their respective services can accurately identify and diagnose all OIE-listed zoonotic pathogens. While 57% of the respondents also indicated that there is an integration of surveillance data between public health and animal health organizations and systems, 86% indicated that data were being shared in a less formal way. 64% of OIE Member Countries reported that antimicrobial resistant pathogens are currently found in their countries in both animal and human populations. Some of the most common antimicrobial resistant pathogens reported were Salmonellas, Campylobacter, E. coli, Staphylococcus, and Mycobacterium tuberculosis.

It is encouraging to note that a majority of OIE Member Countries are capably diagnosing many zoonotic pathogens and that even more countries also share data and disease surveillance results with public health officials. However, it was less encouraging to note the high percentage of countries reporting that antimicrobial-resistant pathogens are being identified in both animal and human populations. At the present pace, emerging and especially re-emerging pathogens are generating antimicrobial-resistant strains at a faster rate than safe, effective new drugs can be developed.

15. CAPACITY

A similar percentage of respondents, 61% and 69%, respectively, indicated that their animal health/veterinary services both have the ability to identify and confront emerging and re-emerging pathogens and are well trained to recognize and respond to zoonotic diseases. Of those answering the question about whether the OIE should offer training in emerging and re-emerging zoonoses, 97% concurred that this would be a worthwhile function of the OIE. When asked about the effectiveness of veterinary educational institutions in training and preparing veterinarians to understand and work on emerging zoonoses, 67% indicated that the critical education and training was being delivered well by their university systems. Finally, about 56% of OIE Member Countries currently have sections or divisions that handle zoonotic diseases, and, of those that reported not having this capacity, 61% indicated that the formation of such a unit is under consideration.

There was almost unanimous support for the OIE to develop and implement training and/or educational programs on emerging and re-emerging zoonotic diseases. While the majority of responding OIE Member Countries indicated that they had some of the existing expertise and training to identify and confront zoonoses, 33% indicated that their respective veterinary educational institutions were not effectively preparing professionals who are capable of understanding and effectively working on these disease issues.

16. PREVENTION AND CONTROL

A surprising 96% of OIE Member Countries responding to this questionnaire indicated that their veterinary services had the jurisdiction and/or authority for identifying, reporting, and carrying out prevention and control programs for zoonotic diseases. At the same time, 86% reported that the jurisdiction was being shared with public health officials. An impressive 92% also predicted that emerging and re-emerging zoonotic diseases would be an increasingly important component of their future programs and activities. Of the members who answered the question about being concerned with the possible intentional introduction of a zoonotic disease into their countries, 58% were concerned about this possibility. About half of the respondents reported having vector-borne disease control programs; for example, West Nile virus, Dengue, Japanese Encephalitis, Ross River virus, Trypanosomiasis, Leishmaniasis, Rift Valley Fever, and Equine Encephalitis. The results of the questionnaire strongly suggest that countries believe that emerging zoonoses will be a more important part of their future and there was obvious concern about the potential for an intentional introduction of a zoonotic pathogen.
17. STRATEGIC PARTNERSHIPS

Eighty-nine percent of OIE members indicate that they had a formal relationship with their public health counterparts and that overall, this relationship was characterized as either excellent or good by 74%. The strong majority of members, or 80%, reported that they had an established public health liaison position. Almost all respondents, 97%, believe that a closer working relationship will develop between animal and public health officials in the future. Although 29% described having an existing interdisciplinary zoonosis centre, almost every member (96%) thought that this would be a useful activity. A very strong 95% of members supported the formation of an OIE Ad hoc or Working Group to address emerging and re-emerging zoonotic diseases and, of those responding positively, 81% indicated that they viewed this as an immediate need. Unquestionably, OIE Member Countries recognize that their futures will be more closely aligned and connected with their public health counterparts. With this recognition, there was very strong support for the establishment of an OIE ad hoc or working group on emerging and re-emerging zoonoses with a clear majority further indicating that this was an immediate need. A surprising number of countries currently already have formalized relationships and/or established public health liaison positions within their public health partner organizations. Thus, there is much to build on with regard to further strengthening relationships between these groups.

18. RESEARCH AND STUDIES

Fifty-seven percent of the responding OIE Member Countries indicated that their countries had experienced an emerging or re-emerging zoonotic disease(s) in the last decade. Also, 41% reported having experienced significant outbreak(s) caused by either a food-borne or water-borne pathogen. The most common etiologies included salmonellas, campylobacters, brucella, E. coli, cryptosporidiosis, Q-fever, leptospirosis, Norwalk-like virus, giardia, shigella, and vibrio cholera. Even with all of these emerging zoonotic disease events, members indicated that the public still minimally understood the issues of emerging zoonoses (49%) and only 10% of the public was categorized as highly aware. In addition, 9% of OIE Member Countries were concerned that intentional introduction of biological agents had actually occurred in their countries. These results suggest that the majority of OIE Member Countries have recently experienced an emerging or re-emerging zoonotic disease and almost half have experienced an emerging zoonosis that was associated with either a food-borne or water-borne mode of transmission. The general public is still not sufficiently aware of these contemporary public health problems, which presents animal health officials with an important opportunity to improve public education. More studies and research are needed to better define the incidence of emerging and re-emerging diseases and the pathogenesis and ecological dynamic of the disease, and to gain more knowledge about the social and economic impacts of zoonoses.

19. DISCUSSION

Emerging and re-emerging zoonotic diseases are responsible for profound political, social, and economic impacts on society. We have recently entered a new epidemiologic era in which these diseases are showing an upward trend and their global effect is unprecedented. Approximately 75% of the new infectious diseases in humans are zoonotic; thus, the veterinary profession and animal health officials are faced with immense challenges and opportunities. The convergence of human and animal health over the last several decades is creating new societal demands and needs, and the role of OIE Member Countries and the OIE itself must decide on a response to not only meet these needs, but also to create new strategies to improve both public and animal health.

The world in which we live and work is growing progressively interdependent and complex. Unfortunately, this interdependence and complexity is also creating new factors to ensure that emerging and re-emerging diseases will continue to have significant effects on animal health well into this century. The OIE and its members have faced a series of strategic decisions in recent years. The engagement of this organization with global trade and the WTO\(^4\) and with animal welfare are examples of an expanding role for the OIE based on changing societal needs and perspectives. The further engagement of the OIE and Member Countries with emerging and re-emerging zoonoses seemingly is no different. The contemporary challenges of zoonoses and their global impact demands the attention and strategic actions of the OIE.

The results of the questionnaire strongly support the premise that the OIE and animal health officials worldwide are experiencing the impact of emerging zoonoses and clearly believe that these diseases and countries' responses will be a much more important part of the future. An impressive number of countries report that they have experienced incidents of emerging and re-emerging diseases, along with antimicrobial-resistant pathogens. The critical factors and forces that

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\(^4\) WTO: World Trade Organization
are driving the new infectious zoonotic disease era are being recognized and experienced by our OIE Member Countries. Responding countries have also indicated that surveillance, research and development, training, technical assistance, and an increased capacity, both in terms of personnel and infrastructure, are key programmatic areas to strengthen and improve. Further opportunities are surfacing that will require stronger partnerships with national and international public health organizations, as well as with universities and private entities. Animal health organizations cannot really transform others without first transforming themselves. The results of the questionnaire suggest that this is clearly understood by the majority of OIE members and the OIE organization itself. The 72nd General Session is an appropriate time for the organization to discuss its direction and future with regard to the inevitability of the increasing importance of emerging and re-emerging zoonotic diseases in our lives and work. The OIE must continue to transform and evolve in response to the needs of its Member Countries and the changing demands and opportunities now on the animal health horizon.

REFERENCES


