



National Collaborating Centre
for Infectious Diseases

Centre de collaboration nationale
des maladies infectieuses

Purple Paper

Personal Insights from the 1st International One Health Congress Melbourne, Australia February 14-16, 2011

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It has long been known that many of mankind's infectious disease have or do come from environmental sources, especially animals. Many of our early plagues were zoonoses. A suite of today's diseases, from the common cold to AIDS likely had their origins in animal pathogens that have since adapted to people. Zoonoses still keep many people in poverty and ill health in developing nations. The sharing of pathogens and their genes between animal and people is being studied to stem the rise of antimicrobial resistance. However, international agencies such as the World Health Organization (WHO) and the governments of developed nations have not invested much attention or resources in recent years to human-animal interactions: That is, until the large scale economic impacts of emerging infectious diseases (EID) like avian influenza, SARS and mad cow disease (bovine spongiform encephalopathy). The 1st International One Health Congress symbolizes the renewed interest in human-animal-environmental health interactions at the policy, research and practices levels.

The Congress sought to build on recent international meetings to maintain the momentum that has been building in the past 5 years of what has been dubbed the "One Health Movement." One World One Health was originally coined as a trademarked phrase by the Wildlife Conservation Society (WCS). The WCS is dedicated to wildlife conservation but it realized that they could not achieve this until problems such as the global wildlife trade and wildlife consumption could be

stopped. To do this, they saw the need to deal with the social and environmental determinants of health in poor communities to give people the capacity to reduce their need to exploit wildlife. In the intervening years, EID researchers and managers have documented how the majority of recent EIDs have been zoonoses, with estimates of 75% being of wildlife origin. Lessons learned from the management of H1N1 and H5N1 influenzas have suggested to organizations like the World Bank that significant efficiencies could be gained by co-managing the human health and animal health infrastructure and programs for zoonotic diseases and pandemic preparedness. This has pushed One Health onto the global agenda.

One Health has been endorsed by the WHO, Food and Agriculture Organization (FAO) and World Animal Health Organization (OIE) as a foundational strategy to get ahead of the next pandemic disease. Their goal is to gain advantages in early warning and to achieve primary prevention of EIDs by working at their origin – in animals and in our shared environment. The One Health approach has been endorsed by senior government officials from around the globe. Many global ministerial pandemic preparedness meetings are demanding the approach be adopted. There is a move to get donor nations to invest billions of dollars into a fund intended to enhance the effectiveness and efficiency of EID programs through investment in collaborative diagnostic and surveillance infrastructure. Yet, as was revealed at this meeting, the concept of One Health has yet to find a shared vision or direction that resonates with all stakeholders.

There was no debate among the delegates that zoonotic diseases have cost society billions of dollars and that better linkages between animal health and public health are likely to create more effective and efficient pandemic preparedness and response programs. There was also little debate that animals can negatively impact human health through endemic zoonoses as well as through the effects of livestock disease on rural poverty and food security. What was debated was the focus on One Health. The subtitle of this Congress was "human health, animal health, environment and global survival." This sub-title not only could allow anything from the discovery of a new coronavirus in

bats to climate change and geopolitics to be part of One Health but it also allowed both infectious disease control and health promotion to be part of the agenda. Delegates from a number of developing nations felt that a One Health program focused only on EIDs would be largely irrelevant to their domestic concerns. There were comments that, if One Health was simply about finding pathogens in poor countries and stopping their spread to rich countries, it would find few sympathetic ears in countries struggling with endemic diseases, poverty and hunger. The majority of poor people around the world are still dependent on livestock for their well-being. Significant gains could be made if One Health encompassed a program of reciprocal care of human and animal health wherein livestock and wildlife provided people with a sustainable income, food security and freedom from endemic zoonoses. Opponents to this view argued that donor governments, UN agencies and the World Bank would need a more targeted approach that focused its resources on the urgent threat of pandemic EIDs. This debate seemed to widen as the Congress progressed over the three days rather than come to any form of consensus.

If one looked beyond this debate, it was easy to find some key lessons that could be readily implemented without the need for consensus on a definition or focus for One Health. There is a growing movement in many spheres of public health for a systems-based approach to disease prevention and control. Multi-disciplinary infection control collaborations are now seen to extend beyond the boundaries of a team of health care professionals within hospitals. Teams including other professionals in allied fields as well as community members are needed to ensure primary prevention is achieved well before people are exposed to environmental hazards such as zoonoses or food contaminants. Central to the systems approach is the need to develop relationships, trust, knowledge and agreements for collaboration and sharing between relevant stakeholders before the next EID or pandemic hits your community. Professional social networking, collaborative pre-planning, integration of investigative capacities can all begin today. Programs such as the Canadian Integrated Program on Antimicrobial Resistance Surveillance (CIPARS) are few in Canada, but are starting to show their value in tackling complex health problems.

Provincial veterinary laboratories are starting to contribute data to the Canadian Animal Health Surveillance Network (CAHSN). By linking CHASN into the Canadian Public Health Laboratory Network, there is hope that Canada will be “ahead of the curve” by seeing emerging disease patterns more rapidly. C-EnterNet is working to link enteric isolate data from people, animals and food to track trends in enteric infections. The Canadian Cooperative Wildlife Health Centre serves as a national resource that watches animal health trends and helps public health agencies track zoonoses in wildlife.

The question I had when leaving this Congress was, “are examples such as those I noted above enough for a Canadian One Health program?” The need for a One Health approach that works to maximize the social benefits of animals while minimizing the risk of human-animal interactions is paramount for developing nations. In many African countries, livestock diseases keep people in a stranglehold of poverty. Endemic enteric zoonoses keep children ill from diarrheal and other diseases. Wildlife consumption remains an avenue for new pathogens to spill into human epidemiological systems. But the same pressures do not exist in Canada. Without a doubt, we are at risk from pandemic zoonoses such as influenza, both economically and in terms of potential impacts on morbidity and mortality. But there was debate at the meeting on whether or not integrating human and animal data would allow us to predict the next pandemic. Prediction was a major goal as well as a subject of much research, but confidence in our ability to predict the outcome of a wicked problem such as pandemic occurrence (which is embedded in socio-ecological systems) was questioned by many delegates. Further investment in enhanced diagnostic capacity often failed to recognize the impediments to getting animals samples to a laboratory; impediments that arise from the private sector economics of animal health. Reports were provided that to date, there are no data available to calculate if linking human and animal health results in more cost effective or efficient EID programs in developed countries (note: there have been remarkable achievements in Africa for co-management of endemic risks such as the collaborative delivery of routine animal and childhood vaccination by linked animal and public health programs). Many of the presentations I

attended at this meeting were about people's experience in trying to collaborate, advocacy for collaboration within a One Health framework or reviews of gaps in policies and programs. The science of One Health can be found largely in infectious disease epidemiology, veterinary public health and zoonotic disease ecology and microbiology. Such presentations were few at this meeting.

If I return to my post-meeting question of whether and how Canada should be involved in One Health, I need to turn to recent experiences in collaboration. I think it is fair to say that the outbreak of *Cryptococcus gatti* in British Columbia and the elucidation of the origins of the waterborne outbreak of toxoplasmosis in Victoria would have been delayed and less efficient if it were not for the BC community of animal and public health workers. The detection and remedy of a rise in ceftiofur resistance in *Salmonella* in Ontario and Quebec benefited from sharing information on human and animal isolates. Canada's swift recognition and management of the H1N1 outbreak was critically dependent on the collaboration of human health and animal health professionals. Tracing the origin of the causative *E.coli* in Walkerton benefited tremendously by veterinarians, physicians and other allied professionals working together. There were many similar anecdotes presented formally and in the hallways of the Congress. There is a need, therefore, in Canada to be prepared to collaboratively respond to these and other zoonotic disease. Such collaborations have been difficult in the past, in my view, where there was no pre-existing trust, knowledge or agreements to work together. Building trust and relationships between sectors was a cross-cutting theme of many sessions at the Congress and should be the focal point of Canada's One Health strategy. Canada currently has a *de facto* One Health collaborative made up of a series of disconnected formal and informal programs across the nation. Linking these programs and people would undoubtedly create new insights and efficiencies.

The list of potential One Health issues in Canada is long and goes beyond EIDs. On-farm food safety, comprehensive programs for antimicrobial resistance management, the assurance of safe and sustainable wildlife as food for First Nations, and the

use of animals as sentinels for non-infectious environmental hazards are but a few examples. However, gaining traction for these programs within a climate of economic constraint and when the health impacts from zoonoses are either low or are largely unmeasured will make it hard to sell more than an EID agenda in Canada. EIDs have cost developed nations too much money to be ignored. There was, however, a ground swell of opinion at the meeting that a two pronged approach to One Health was needed. On one hand, much can be gained in EID preparedness, prevention and response by linking human and animal pathogen detection, investing in animal health to reduce the risk of emergence at source, and integrating surveillance and investigation systems. On the other hand, investment in systems approaches to health can provide capacity that can cut across a wide swath of health issues and requires support. One Health, ecohealth, health promotion, and disease ecology all share similar goals of deploying a systems view on health problems and on developing multi- to interdisciplinary teams that use participatory approaches to finding solutions to health issues. Investment in building Canadian capacity in perspectives, people and intellect to apply such an approach may do more to advance One Health in a sustainable fashion than investments that target specific technology for specific diseases.

Finally, it was brought up repeatedly at the Congress that the underlying idea of One Health is not new. William Osler taught it, as did Hippocrates. The apparent decline of zoonoses in developed nations and the increasing urbanization of society divorced us from the realization that our health is embedded in the world around us. EIDs reminded us that human health depends as much on the natural environment as it does on the built environment and the social determinants of health. The infectious disease community in Canada perhaps more than many others has been at the front of the receiving line of this relationship. Advocacy for prevention of EID and zoonotic pandemics cannot ignore the need to work at the source of these diseases – at the human-animal-environment interface.

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