

1st International One Health Congress

Summary

14 – 16 February 2011



Key messages arising from the inaugural International One Health Congress:

The One Health approach

- **Recognises the interdependence of, and seeks to improve human, animal and environmental health**
- **Recognises that communication, collaboration and trust between human and animal health practitioners is at the heart of the One Health concept**
- **Has a broad vision and includes other disciplines such as economics and social behavior that are essential to success**
- **Needs to promote the 'doable' such as improving surveillance and response for emerging infectious diseases whilst developing the broader approach**
- **Emphasises community participation and development of community capacity, and especially, an open transparent dialogue**
- **Requires both 'ground up' and 'top down' action**
- **Recognises that understanding ecosystems, including molecular ecobiology, are an essential part of One Health.**
- **Recognises that One Health is a major component of food security and safety**

The summary below highlights the key activities and discussions at the meeting along with identifying some science innovations. It does no real justice to all that presented and discussed during the Congress but does provide a broad overview.

More than 650 people from over 60 countries attended the 1st International One Health Conference, held in Melbourne on 14 – 16 February 2011. Scientists, clinicians, government and community members from a range of disciplines came together to discuss the benefits of working together to promote a One Health approach to human, animal and environmental health. One Health embraces systems thinking and recognising the interdependence of people, animals and environment. The conference was hosted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and was supported by international agencies, Australian and Canadian governments and industry.

The Organizing Committee recognized from the outset, the need to provide a forum not just for scientific presentation, but for open discussion and dialogue around the policy and political issues, as well as the science that drives the One Health agenda. The Committee was also cognizant of the need to embrace a definition of One Health that includes food security and food safety and includes the social and economic pressures that shapes human, animal and environmental health. The meeting was therefore organized under four Themes with Plenary sessions followed by breakout parallel sessions for each of these. The Themes covered, Disease Emergence; Environmental Drivers; Trade, Food Security and Food Safety and Science Policy and Political Action. The Plenary Session commenced with one or two keynote presentations by world leaders on the topic being covered, followed by Panel discussions involving 6 – 8 experts and involving all participants at the Congress. Each of the panel members spoke briefly on the topic covered by the keynote speaker and were asked to be as provocative as possible. The discussions that followed were designed to debate and discuss the keynote presentations and the Panel members comments. This was followed by 6 – 8 parallel breakout sessions involving in depth papers on the session's topic. As much as was possible, the papers were grouped under general headings but the sessions were organized in such a way, that participants could move freely around these parallel sessions to pick and choose the particular papers they wished to hear. Importantly throughout the conference at various times, sponsored sessions dealt with particular areas of science or policy providing a further framework not only to learn current science but for debate and discussion.

The conference began with dances, stories and song from the traditional peoples of the Wurundjeri. The songs and stories told of the need of harmony between the earth, animals and man for physical, mental and spiritual wellbeing.

The plenary speakers at the opening session, 'Setting the Scene', put forward the challenges that framed and informed the three days of intense discussion. It was fitting that humanitarian, scientist and Nobel Laureate, Professor Peter Doherty, opened the conference.

Setting the Scene

Professor Doherty's keynote speech dealt with the growing evidence of negative impact of human behavior on the health of the world and the likely risk to humankind. He called on the scientific world to push for a collaborative, principled plan to examine and provide evidence based pathways addressing causes and effects of deteriorating global ecosystems.

'Anthropogenic change is an unacceptable experiment. We are dumping fossil fuel into the atmosphere and do not know what the outcome will be.'

Professor Peter Doherty

This was followed by a series of presentations to set the scene for developing the later discussions at the international, national and local levels. Dr Takeshi Kasai, Director of Health Security and Emergencies at the WHO Western Pacific Regional Office provided an overview of some of the regional disease threats, and then discussed the processes which WHO have developed to ensure that *rapid reporting of outbreaks of international public health concern is achieved through the new International Health Regulations*, and the bi-regional Asia Pacific Strategy for Emerging Diseases in which a One Health approach with support from FAO and OIE forms a major component in providing a response to zoonotic disease threats. Dr Suwit Wibulpolprasert, senior adviser in disease control to the Thailand Ministry of Health, spoke of the challenges of applying a One Health approach to global health. *The four main challenges he delineated as: determining definition and scope, being clear whose wellbeing we are talking about, working together as a team and with trust, and, fourthly – how to avoid failing!* To the fourth challenge he presented five points.

1. Regular meetings – confirm we are working together and what allows us to share
2. Consensus, commitment and collective actions
3. Horizontal and vertical social trends to form strong 'social fabrics'
4. Respect seniority, culture and historical objects
5. Respect those who are weaker – children, women, elders, animals, plants.

'Is social equity and justice considered in One Health? If social justice is not included, we cause 'unjust'. A more sustainable world is a more just world.'

Dr Suwit Wibulpolprasert

David Butler Jones, the Chief Public Health Officer of Canada, noted in his speech, *'Breaking down barriers and creating connections'*, that the fundamental resources for health are peace, shelter, education, food, income, stable ecosystems and sustainable resources. He reiterated Professor Doherty's call for holistic science based action, pointing out the need for systems consideration and research, noting, for example that *'climate change is not a linear model – it cannot be predicted lineally'*. Dr Brian Evans, Chief Scientist for the Canadian Food Inspection Agency, put forward that *a One Health approach was a necessity and one in which politics, trade and economics could not be separated*. Dr Jim Bishop, Australian Chief Medical Officer, and Dr Bob Biddle, representing the Chief Veterinary Officer, discussed the impact of One Health on national public health and animal health issues specific for Australia, many of which are common to other countries, but which also impinge on aspects of food security. Finally, Professor Tom Riley used the model of *Clostridium*

difficile to demonstrate the importance of better understanding transboundary diseases between animals and humans, as an example of the One Health approaches needed to meet these disease risks.

Disease Emergence

The first day's emphasis on emerging infectious diseases provided a discussion of their global drivers and strongly linked with those Themes dealing with trade, people density, people and animal movement, changing agricultural practices and climate change, and, also importantly, local and regional level drivers. Professor Ron Atlas emphasized the need for a One Health approach *for surveillance to ensure the early detection of evolving pathogens and to determine where and when the critical events in the evolution of new pathogens occur*. He also suggested the need for a new paradigm to broaden the meaning of the term zoonoses to recognize that *the flow of microbes and their genes can be multi-directional and include environmental reservoirs*.

A session on the human-animal interface describing joint collaboration between WHO, OIE, FAO, the International Union for Conservation of Nature, United Nations Environment Program, and the Global Outbreak Alert and Response Network (and partners) in outbreak investigation and response was chaired by Dr Pierre Formenty. Presentations included a discussion on Rift Valley fever virus outbreaks in Madagascar, Tanzania and Sudan; Ebola-Reston outbreaks in the Philippines; searching for the reservoir hosts of SARS-coronavirus; the importance of *in situ* conservation organizations in surveillance, as exemplified by the Wildlife Conservation Society using hunter-based surveillance for Ebola virus in the Congo; and the need to ensure behavioural and social interventions are a fundamental component for preparedness and response to zoonotic outbreaks. Indeed the latter paper made the very important message that an inclusive, *holistic view of "strategic health communication" is needed that embraces multiple approaches and methodologies*, and with clear expectations of its purpose and role. It might be that we need to invest and strengthen capacities at key critical levels, but the end result could be an important vehicle for demonstrating the principles and foundation of the One Health concept in practice.

Extensive research into bat ecology and bat viruses provided an insight into the application of One Health, enabling a better understanding of risk to populations and potential solutions such as habitat management. Molecular laboratory work is as important as considering climate patterns and wind stream movements. *The development of bat cell lines will enable research into the wide diversity of viruses*, both species wise and within species, found in bats. Rift Valley Fever outbreaks in South Africa show that virus isolates have little diversity but were capable of spreading under the right climatic conditions.

The emergence of significant wildlife disease such as Chytridiomycosis and marine pathogens reflect insufficient risk perception and assessment and capacity limitations . There is simply not enough awareness and knowledge.

The avian influenza virus, H5N1 is still evolving in wild bird reservoirs and has been isolated from domestic pets. Resistance to the neuraminidase inhibitor, oseltamivir

(Tamiflu), is now being found in many environments and there is the potential for resistance to occur in wild birds. It was argued that *a reactive response to avian influenza alone* is insufficient; culling of infected birds does not address the underlying reasons for emergence of H5N1.

Environmental Drivers

In the Plenary session, Dr Peter Daszak, President of the EcoHealth Alliance, provided an in depth look at the *'hotspots' driven by people and trade movements* and the likelihood of potential emergency infectious diseases (EID) in different parts of the world. Dr David Waltner-Toews, a Canadian veterinarian, defined health as *'an outcome of constantly complex interactions among the social and ecological conditions in which society is embedded'*. He emphasized the need for an ecological approach to systems thinking at all levels and to support the development of people's capacity at the local level to apply such an approach. He argued that *there is no one discipline that fully addresses or which could take responsibility for One Health, although public health is a discipline that should provide a leadership role*.

Papers on climate change and the ensuing discussions recognized that clearly climate change is happening yet its impacts and how the world responds is uncertain. Agricultural practices impact on climate and are likely to be impacted by climate change in the future. This and *increasing meat consumption will cause global food insecurity and animal/environment nutritional stresses*. Changes in temperature and rainfall are adding to other drivers such as population density and movements, impacting on the emergence of infectious disease. One Health needs to consider the wider ramifications of climate change such as ocean warming and changes to water currents and air streams. As an example, Inuit populations are already feeling these impacts with the levels of dioxin in Inuit mothers' breast milk having been found to be higher than anywhere else in the world, largely due to deposition of chemicals in the Arctic by air and sea current flows. To improve health in Inuit populations it is necessary to look at global causes. *Understanding impacts of current cycles, for example, the drought-rainfall cycle in Australia, may provide models to improve resilience in other parts of the globe*.

It was shown in a number of papers that *surveillance systems need to be integrated geographically and across disciplines*. Surveillance of animal health is poor and surveillance of wildlife and ocean life are almost non-existent. In Australia, for example, integration could be possible between the Australian Biosecurity Intelligence Network and the Wildlife Health network. The World Small Animal Veterinary Association (WSAVA) is advancing incorporation of companion animal disease surveillance. The *Russian Anti Plague System* has been adapted to collect information on environmental, human and animal components. Connecting Health Organizations for Regional Diagnosis and Surveillance (CHORDS) demonstrates sharing of data, methodologies and standards and resources across countries in Southeast Asia.

Trade, Food Security and Food Safety

In the Plenary session, David Nabarro described the UN system High Level Task Force (HLTF) on the Global Food Security Crisis and the Updated Comprehensive

Framework for Action (UCFA). He highlighted the many actions being taken to address food security in a comprehensive and collective way that recognized *the right to food, the need for effective ecosystem management but with access to land and water security that would underpin addressing adequate nutrition including urban hunger*. This thought provoking presentation clearly embraced all elements of One Health.

In the subsequent sessions many papers dealt with surveillance and risk assessment approaches that are needed to underpin both trade and food safety. Tools such as *Epicollect*, which uses mobile phone technology, are increasingly able to be effective in many settings including remote conditions. MAX management which incorporates such factors as monitoring animal movements, is an example of software utilised to predict and map livestock outbreaks. Infection Ecology and Epidemiology (IEE), a new movement in Sweden, includes coordination of funding and education initiatives as well as information exchange. Specifically it includes interest and work on impact of co infections with non-highly pathogenic agents such Ebola Reston. The IEE *'facebook and friend finder' and the open access journal are mechanisms effective in disseminating information widely*. Papers covering Risk assessment and predictive modeling covered for example the association of months of dry weather prior to Hendra outbreaks in Australia, and other factors from previous outbreaks to inform risk assessment. Risk assessment enables outbreaks to be anticipated and allows for preventive action to take place. For example, flooding for potential increase in leptospirosis, anti flea campaigns for plague, capture of wild dogs or ensuring domestic animals health for rabies, removal of pigs from urban setting, to reduce the chance of Japanese encephalitis. Complex predictive models are tools used for risk assessment of emerging infectious diseases as well as for other areas such as:

- the design of vaccination programs like Q fever in the Netherlands
- the social and private cost of disease such as brucellosis in Krygystan
- cost-benefit assessment of public health interventions such as the REV-1 (brucellosis) vaccination.

The involvement of community people is essential in predictive modeling as are tools such as satellite telemetry (GPS) and remote sensing.

A number of papers focused on the broader aspects of community engagement and broaden the stakeholder groups involved. The One Health Alliance of South Asia (OHASA) aims to predict and prevent emerging infectious diseases on the Indian subcontinent, incorporating consideration of population growth and movement, food insecurity, public health threats and fragile ecosystems. Healthscape, an initiative in Kings County, Washington State, has developed a Development Impact Assessment tool which takes into account land use, transport, air quality and potential climate change to predict impact on public health. Further examples included HPAI in Indonesia, bush meat pathogens in Ghana, equine influenza outbreaks in Australia, West Nile virus in the USA, Rift Valley fever and rabies in Kenya and milk purity in Mali, and all indicated that *different communities often have different perceptions and understandings and there is much to be gained by increasing knowledge and awareness*. Setting up Animal Health Clubs in Africa has assisted in knowledge of animal-human environment interactions.

This awareness in turn enables behaviour change in prevention and timely response. Social factors such as gender and culture must be incorporated in implementing disease prevention and response, for example respecting the role of dogs in Australian Aboriginal culture and promoting dog health rather than dog eradication.

The knowledge and evidence base for One Health is improved by sharing research directions, methodologies and findings. EPIZONE, an EU-based network, shares technology as well as information to further understand and promote action for epizootic disease.

'Post normal science - prepare the decision-makers to the need for new/different science perspectives in addressing different problems. With increasing uncertainty, it makes it harder to communicate with our stakeholders including the public. So with this imperfect science, we need to feel comfortable with ambiguity and adapting with new data being produced.'
Peter Black.

The genomic revolution will change agriculture and medicine and, along with this, it will be essential to develop the science of bioecology in depth. One Health organizations need to rely on not only socioeconomic studies but also political economy studies in areas such as the link between money, power and debt relations. *Any change will always involve political economic factors*, which need to be handled with sensitivity. The importance of this clearly reflected in the refusal of Indonesia to share HPAI viral strains believing that any outcomes from such sharing would not benefit developing countries.

Access to and distribution of medicines and vaccines underlie the crucial involvement of the veterinary and medical pharmaceutical industry. Similarly, it has, along with animal human health care workers, a pivotal role in turning the tide of antimicrobial resistance. Vancomycin resistant *Clostridium difficile* (VRCD) and methicillin resistant *Staphylococci aureus* (MRSA) are now causing significant burden of disease. Harmonizing international rules and trade, reducing and monitoring antibiotic use in animals, limiting or banning routine antibiotic prophylaxis in animals are steps that should be taken to reduce antimicrobial resistance.

Eradication of disease may be, in itself, not a complete answer. We must consider such questions as that put forward by Richard Kock from the Royal Veterinary College in London *"If we have eradicated Rinderpest, could we be disrupting an unknown ecological niche"*?

Science Policy and Political Action

This Plenary Session sought to bring together many of the thoughts of the past two days and both keynote speakers highlighted the need for concerted political action to genuinely move forward the One Health agenda both at the national and international level. However it is clear that National Governments and International Organizations have recognized the benefit of One Health. The United States Government by setting up the USDA One Health Multi-Agency Coordination Group. Canada is applying a One Health approach to zoonoses. Regional developments include the OHASA (South Asia) group, EPIZONE (Europe) and IEE (Sweden).

A challenge for One Health and International Organizations in particular is to develop *a language* that can be understood by all players. Leadership is required in integration of One Health elements in a ‘top down’ approach. UN Organizations have combined in an unprecedented way to look at pandemic action forged through the United Nations Systems Influenza Coordination (UNSIC) group. Dr David Nabarro, Senior UN System Co-ordinator for Avian and Human Influenza, noted that many of the positive elements of this collaboration are being progressed to further promote integration between international agencies.

In the accompanying session, *education, training and involvement of the community were emphasised* across all areas of One Health but particularly in farm management, surveillance predictive modeling and prevention and response to emerging infectious diseases. *Cross discipline training is necessary* and in the developing world the health care worker is considered a key figure in promoting One Health approaches. Non Government Organisations such as the Sikkim Anti-Rabies and Animal Health (SARAH) program tend to have a ‘ground-up’ approach and are usually able to identify effective roles and training at the community level.

Programs such as *TUSK* allow file-sharing across the world and offer online courses to facilitate cross sectional learning. *Initiatives such as a shared curriculum, specific curriculum, development of specific workforce roles and development of multidisciplinary workshops at different levels will enable effective One Health practice.* Public-private partnerships, which are essential in addressing for example, neglected zoonotic diseases which that do not attract traditional commercial interest and must be sponsored.

Specific Hosted Sessions

On the need to embrace community involvement

This need to embrace societal interventions was echoed in a special session sponsored by the International Development Research Centre of Canada (IDRC), which demonstrated eco-health research with a central focus of *community development as a key enabler at the local level*. Dominique Charron from IDRC, along with many other speakers, argued for integral involvement of other disciplines such as social science, economics and anthropology in moving forward in One Health thinking.

On previous One Health Initiatives

Important presentations were made by Dr Joe Anelli, United States Department of Agriculture (USDA) and Dr Carol Rubin, Centres for Disease Control and Prevention (CDC) on the Stone Mountain Meeting held last year to operationalize One Health. This meeting had followed on from an earlier meeting held in 2009 in Winnipeg, Canada and hosted by the Public Health Agency of Canada, entitled “One World, One Health: from ideas to action”, the purpose of which was to discuss a Strategic Framework and to identify and shape country-level recommended actions to globally advance this framework. The Stone Mountain meeting, held May 2010 and hosted by CDC, was aimed at moving the concept of One Health forward by defining a series of specific action steps. A specific goal was to develop sustainable inter-sectoral collaboration at international, regional, national, and sub-national levels by

identifying concrete opportunities for implementing One Health strategies and recognizing key barriers and possible options for overcoming these barriers. At the Stone Mountain meeting seven key activities were selected as fundamental to moving forward the One Health agenda in order to reach the three to five year vision. These were:

1. *Training*: Develop and build skills, expertise, and competencies through a One Health training curriculum and identify opportunities to integrate One Health approaches into existing curricula.
2. *One Health Global Network (OHGN)*: Advocate and garner international support for One Health through a network that serves as a vehicle for further global collaboration on One Health programs and projects.
3. *Information Clearing House*: Promote One Health advocacy through a centralized area where One Health success stories are gathered and made available to a wide-ranging audience.
4. *Needs Assessment*: Develop country level self-assessment methods to identify programmatic areas that could benefit from a One Health approach and areas for targeting improvement.
5. *Capacity Building*: Identifying ways to leverage existing programs and capacity-building efforts in order to have a major impact at very little cost.
6. *Proof of Concept*: Demonstrate through a retrospective and prospective evidence base that the use of One Health interventions leads to better cross-species health outcomes.
7. *Business Plan*: Articulate the subject area of One Health more clearly and present it to policy-makers and donors at the global level.

Each group was asked to develop One Health plans and partnerships that would occur within a designated timeframe. The groups developed specific goals and objectives and will convene and continue their development process. The invitation only status of the Stone Mountain meeting was noted although ongoing processes and meetings will be transparent and many initiatives will arise embracing a much wider community and disciplines.

On an International Society for One Health

There was wide support for the Stone Mountain initiatives, and a strong feeling that they were providing a major platform through which One Health activities could progress on a broad front. However, although the Stone Mountain movement was warmly applauded, there was also a feeling that the One Health dialogue needed to be broader and more transparent, especially by encouraging developing country participation in the ongoing discussions. *Many zoonoses, especially the recent examples of novel agents, were seen to originate in developing countries and this has also been reflected in the importance of a One Health approach to zoonoses in the Asia Pacific Strategy for Emerging Diseases*, as described earlier by Dr Takeshi Kasai. This was, in essence, the background to the suggested International Society for One Health. The convening of an International Society for One Health was discussed at an early morning meeting and while the general concept was agreed, further discussion to define the parameters and scope was required. Indeed there was a strong indication that a loose association or network might be preferable to a 'society', together with a mechanism to hold further One Health congresses and an avenue in

which to feed information into the ministerial discussions held by WHO, FAO and OIE. As such, a further meeting was suggested and this is currently being planned for June this year.

Closing Plenary

In the closing plenary, Dr David Heymann, Head and Senior Fellow of the UK Centre on Global Health Security, joined Dr David Nabarro in noting the consensus in spirit on a broad approach incorporating the principles of collaboration and holistic ecohealth system thinking, but to move forward quickly where possible. This was echoed by Ms Jane Halton, Secretary of Australia's Department of Health and Ageing, who urged for clarity and a clear business case to take forward to policy makers and to move forward on the 'do-able'. Jorgen Schlundt, of the National Food Institute, Technical University of Denmark, emphasised the importance of tackling surveillance and response to emerging infectious disease as an immediate do-able.

Many participants were articulate in reminding all the speakers of the need for a broad vision for One Health but at the same time to have targeted and focus actions to deliver tangible outcomes. Developing the interconnectedness, collaboration and principles needed to fully practice One Health was seen as a must, as was still aiming for progress in goals that can be achieved immediately.

Discussions have begun already with interested countries on the Second International One Health Congress, to be held in 2013.

Abstracts can be accessed in a special supplement of the EcoHealth Journal: 2011, Volume 7, Supplement 1 and can be accessed on line at www.springerlink.com.

The Organizing Committee was co-chaired by Professor Martyn Jeggo, Director of CSIRO's Australian Animal Health Laboratory, and Professor John MacKenzie, previous Director of the Australian Cooperative Research Centre in Emerging Infectious Diseases and a Consultant to the World Health Organization.

Sponsors to the Inaugural One Health International Conference were:

- Commonwealth Scientific and Industrial Research Organization (CSIRO)
- European Union
- Department of Health and Ageing, Australia
- Department of Agriculture, Fisheries and Forestry, Australia
- Food and Agriculture Organization of the United Nations (FAO)
- International Development Research Centre of Canada
- The Australian Agency for International Development (AusAID)
- Life Technologies
- Animal Health Australia
- Public Health Agency of Canada
- CEVA Animal Health

- GALVmed
- Deakin University, Australia
- Pfizer Animal Health
- Department of Primary Industries, Victoria, Australia
- Australian Biosecurity Intelligence Network
- Burnet Institute, Melbourne, Australia
- ConservAction.org
- DAI
- CAPPE
- Abbott Molecular