

## **AHA Position Statement on One Health**

### **Summary**

**In Australia, it is recognised that a One Health approach will provide a coordinated, collaborative, multidisciplinary and cross-sectoral approach to the development of health and biosecurity strategies for people, animals and the environment.**

**This Position Statement provides guidance to Animal Health Australia (AHA) executive, staff and members for determining our potential involvement in activities that may benefit from a One Health approach.**

**AHA will utilise a One Health approach through national, multidisciplinary partnerships in the broad areas of animal and human health, biosecurity and biodiversity. One Health biosecurity issues of interest and relevance to AHA include; animal disease preparedness and response, surveillance and biosecurity, sustainable animal production, trade and market access.**

**AHA recognises that a One Health approach is an important way to add value to disease control and research. Rather than competing for resources and legitimacy, a One Health approach presents an opportunity for the respective health agendas to mutually reinforce and support each other in their endeavours. AHA plays an important role in supporting the livestock industries and governments, and providing leadership and advice on animal health issues within the One Health arena.**

AHA has three major roles when adopting a One Health approach where requested by Members:

- To provide advice on animal health issues within a One Health context.
- To coordinate multidisciplinary, collaborative projects to achieve One Health solutions where efforts will deliver animal health outcomes consistent with AHA strategic directions.
- To contribute to the development and communication of One Health research and policy initiatives.

The following principles for AHA's involvement in One Health matters are proposed:

- a) AHA will provide a mechanism that enables industry and government to maintain and increase market access and improve livestock wellbeing through effective partnerships that address One Health issues.
- b) AHA will work with Members to achieve agreed sustainable outcomes for the strategic management of shared One Health risks.
- c) AHA will facilitate the engagement<sup>1</sup> of the livestock health sector in One Health discussions.

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<sup>1</sup> AHA would use the most appropriate level of engagement to achieve the outcome desired – i.e. see the range of activities on the IAP2 spectrum: informing, consulting, involving, collaborating, and empowering.

- d) AHA will seek new ways to assist industry, including through partnerships and R&D, in the development and implementation of verification systems and tools that benefit from a One Health approach.
- e) Where requested, AHA will contribute livestock health expertise that balances current scientific knowledge, sustainable industry practices and community expectations, to One Health policy developments.
- f) AHA will maintain a livestock – related, One Health capability for a productive contribution to Members livestock health issues. Specific projects will be funded by appropriate stakeholders.

The outcomes under the 2015-2020 AHA Strategic Plan that relate to One Health, in order of general relevance are:

- Enhanced national policies and strategies to address ‘One Health’ issues, including zoonotic disease and anti-microbial resistance.
- Enhanced strategic partnerships and collaborations with PHA, RDC’s the supply chain and other organisations
- Enhanced EAD preparedness and response arrangements
- A robust integrated livestock health system in which national and international partners have confidence.
- Effective industry specific, on-farm biosecurity plans and other tools
- A measureable increase in industry verification systems and tools for livestock health and welfare to support market access
- A consistent legislative and regulatory approach to achieve sustainable and improved livestock health, biosecurity and welfare outcomes.

### Summary of AHA’s current involvement in One Health issues

Many of these activities contribute a part of a One Health approach.

Inclusions	Exclusions
Participation in One Health projects or forums where expertise on animal pest and disease preparedness and response, surveillance and biosecurity, trade and/or food security, industry and ecosystem sustainability is required or requested (e.g. antimicrobial resistance).	Response to public campaigns Advocacy
AUSVETPLAN liaison with the Australian Government Department of Health	Direct involvement in Department of Health Communicable Diseases Network
EAD Reference Group advice to Department of Health projects/issues where required	
Relevant zoonotic disease reporting through NAHIS	

Wildlife Health Australia involvement including in the coordination committee and data reporting	
Farm Biosecurity consideration of One Health issues.	
Biosecurity RD&E Strategy gap analysis and coordination of R&D collaboration on One Health issues.	
Livestock Production Conditions management strategies for zoonotic endemic diseases.	
Strategic liaison between government and AHA industry Members on One Health issues.	Chemical registration process
Contribute advice to industry and government policies as requested e.g. Use of antimicrobials	Implementation of regulations. Advice on matters of regulation. Involvement in direct delivery of human or animal health interventions (e.g. Leptospirosis, Hendra virus or Q Fever vaccination).
Manage the development of One Health policies and guidelines as requested	Response to specific One Health issues in the media
Communicate AHA activities as relevant	Extensive communication programs unless funded
Maintain relationships and appropriate links with other groups/sectors/disciplines e.g. experts in plant health, public health, medical entomologists, emergency management personnel etc.	Companion animal, plant pest and weed issues where they are not relevant to livestock or Members interests
Monitor developments on international animal, environmental and public health issues – watching brief.	Active research unless requested and funded.
Provide support to the development of industry QA and verification systems – e.g. definition, development and recognition of systems.	Verification of QA systems.
Respond to enquiries from Members on One Health issues as they relate to livestock health.	Respond to non-member enquiries unless in member interest.
Food chemical residues reporting through NAHIS	Food safety responses
Other One Health-related projects as approved and funded.	Unfunded work for non-members.

**Attachments: A: Background**

**B: Further useful reference documents on One Health**

## Attachment A: Background

### 1. International definition of One Health:

While a number of definitions for the concept of One Health have been proposed<sup>2</sup>, frequently used is that developed by the American Veterinary Medical Association<sup>3</sup>:

***‘The integrative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals and the environment.’***

The importance of One Health is promoted by scientists and practitioners in many countries and is supported by prominent organizations including the World Health Organization (WHO), Food and Agriculture Organization (FAO), and the World Organization for Animal Health (OIE). In Australia, a number of organizations are promoting One Health approaches including the Public Health Association of Australia (PHAA)<sup>4</sup>.

One Health has been driven by a zoonotic disease focus typified by the often quoted statistic of 75% of emerging infectious diseases being zoonotic<sup>5</sup> (including HIV, Hendra and Nipah virus, Ebola and influenzas) with significant social and economic impacts. There are a number of recognised global drivers resulting in increased linkages between humans, wildlife and domestic animals<sup>6</sup>. Addressing potential or existing risks that originate at the animal-human-ecosystems interface must be underpinned by a One Health approach. The FAO, OIE and WHO<sup>7</sup> are collaborating to coordinate global activities to address health risks with flagship topics including rabies, antimicrobial resistance and influenzas.

The breadth and scope of the One Health concept makes it difficult to articulate a definition that covers all of the relevant aspects, however, this also enables the approach to have greater flexibility. In the contemporary context, it is based on the premise of the 2004 Manhattan Principles (appendix A) that ‘no one discipline or sector of society has enough knowledge and resources to prevent the emergence or resurgence of diseases in today’s globalized world’<sup>8</sup>.

The 2010 Stone Mountain meeting focused on operationalizing One Health from a policy perspective. A notable outcome of this was the setting up of a number of forward looking

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<sup>2</sup> Gibbs PJ (2014) The evolution of One Health: a decade of progress and challenges for the future Veterinary Record 2014 174: 85-91

<sup>3</sup> American Veterinary Medical association (AVMA) One Health Initiative Task Force (2008)

<sup>4</sup> <http://www.phaa.net.au/oneHealth.php>

<sup>5</sup> Taylor LH, Latham, SM and Woolhouse ME (2001) Risk factors for human disease emergence. Philos Trans R Soc Lond B Biol Sci. 356(1411): 983–989.

<sup>6</sup> Daszak P, Cunningham AA and Hyatt AD (2001) Anthropogenic environmental change and the emergence of infectious diseases in wildlife. Acta Tropica 78 (2): 103–116.

<sup>7</sup> See Appendix A The FAO-OIE-WHO Collaboration A Tripartite Concept Note (2010) [http://www.who.int/influenza/resources/documents/tripartite\\_concept\\_note\\_hanoi\\_042011\\_en.pdf](http://www.who.int/influenza/resources/documents/tripartite_concept_note_hanoi_042011_en.pdf)

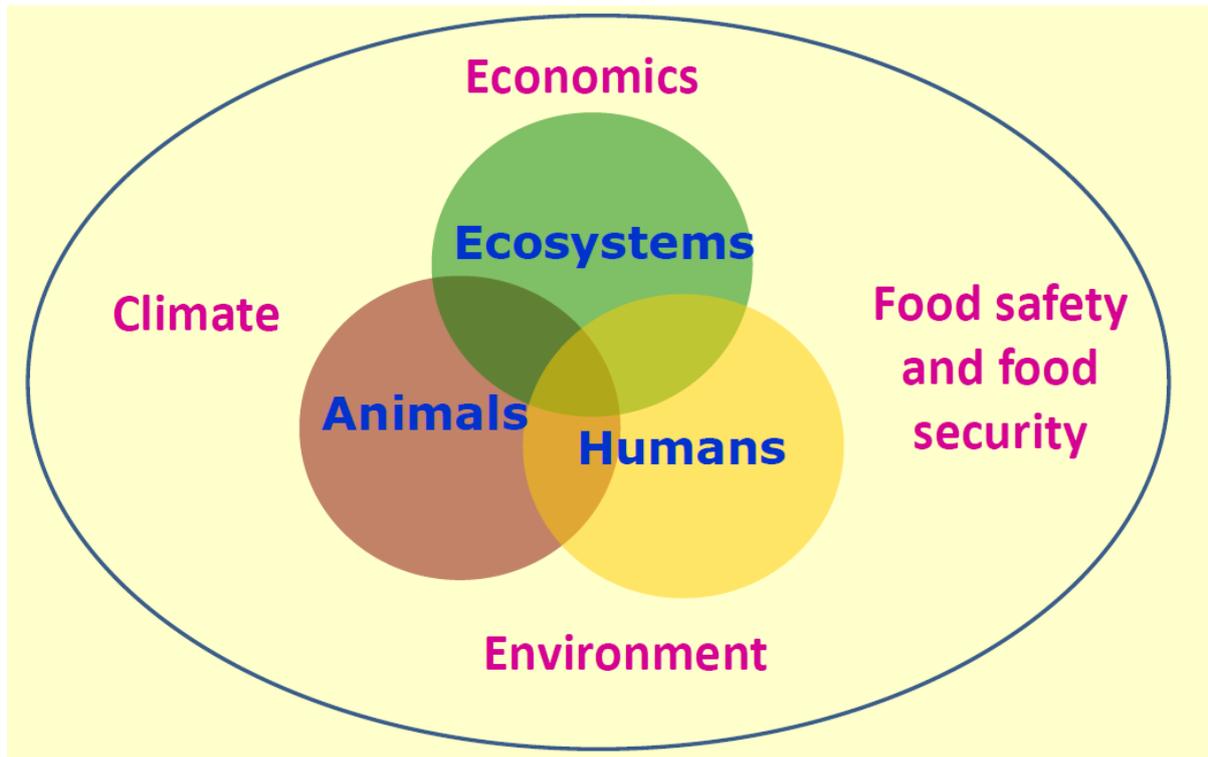
<sup>8</sup> Cook RA, Karesh WB and Osofsky SA (2004) The Manhattan Principles on “One World, One Health”, Wildlife Conservation Society, Bronx, New York, USA (<http://www.oneworldonehealth.org/>)

working groups and the development of two websites for communication and information sharing:

<http://onehealthglobal.net>

<http://www.onehealthinitiative.com>

The following diagrams illustrate the One Health concept by showing some of the broader linkages and “impact cascades” between the different systems.



Mackenzie JS (2014) Symposium on Emerging Infectious Diseases in Southeast Asia.



Figure 2. Human pressures on the environment result in global-scale environmental change, which can impact ecosystem services, and ultimately impact the health of humans, animals, plants, and the ecosystems they share.

Barrett MA and Bouley TA (2014). Need for enhanced environmental representation in the implementation of One Health.<sup>9</sup>

It is important to note that the current vision of One Health is hindered by shortcomings in articulating a One Health agenda. It is unclear whether the One Health concept will continue into the longer term, given that its current status has been driven by active advocacy and the convergence of a series of alliances, specific events and related agendas.

## 2. Australian context

**In Australia, a One Health approach will provide a coordinated, collaborative, multidisciplinary and cross-sectoral approach to the development of health strategies for people, animals and the environment.**

At the national level to date, Australia has taken a modest effort towards enacting a One Health approach to cross-disciplinary issues and it has been difficult to achieve a high level of national collaboration, particularly for shared funding of initiatives. AHA acknowledges the potential of a One Health approach to strengthen collective action across sectors. Interdisciplinary collaboration is at the core of the One Health concept, however to date, it has largely been driven by the veterinary medicine and animal health sector. There are several reasons for this that will vary according to the issue including; political and institutional arrangements, traditional siloed approaches, legal issues, different scientific paradigms and language, organisational cultures, lack of trusting relationships, and restricted resources that have made it difficult to implement true one health approaches.

<sup>9</sup> Barrett MA and Bouley TA (2014). Need for enhanced environmental representation in the implementation of One Health. <http://dx.doi.org/10.1007/s10393-014-0964-5>

Significant drivers are required to overcome the natural inertia of management systems that impact on a One Health approach.

AHA recognises that a One Health approach is an important way to add value to disease control and research. Rather than competing for resources and legitimacy, a One Health approach presents an opportunity for the respective health agendas to mutually reinforce and support each other in their endeavours. AHA plays an important role in supporting the livestock industries and governments, and providing leadership and advice on livestock health issues within the One Health area.

In human health, Australia has experienced low rates of infectious or communicable disease (CD) for the last sixty years. The governance arrangements in health are similar to that in agriculture but more complicated. Australian and state governments fund CD control activities but states and territories have primary responsibility for detecting and controlling CD in their jurisdiction. The Australian Government is broadly responsible for managing the risk of imported CD and national health emergencies. National activities are organised and agreed through a multiplicity of committees, advisory and expert groups.

The Framework report states that a more coordinated, strategic approach is increasingly important to maintain and improve CD control. Communicable diseases present an ever changing risk to society, especially considering the speed and scale of national and international travel, and cannot be managed within nation states or in jurisdictions within a nation.

Human health has its own set of health arrangements issues which would be enhanced by improved national coordination, and a delineation of functions and responsibilities to help national priority setting and decision-making. Incompatible data systems, different laboratory testing and inconsistent legislation currently limit identification and control of inter-state outbreaks and emerging national CD issues. Delays in detection can hamper an effective response. The potential costs to health and the economy are considerable.

The National Framework for Communicable Disease Control proposal within the Department of Health to form a higher profile Communicable Diseases Centre<sup>10</sup> has progressed with development of an implementation plan over three years. The framework acknowledges that more new and re-emerging communicable diseases are inevitable due to changing interactions between humans, the environment and organisms, but the diseases are almost impossible to predict. Further work is required to develop governance and policy options to implement the Framework. Implementation will focus on building on and improving the current system of CD prevention and control. The timeline is uncertain.

The Australian Government's Department of Agriculture has prime responsibility for peace time liaison with the Department of Health and the Communicable Diseases Network of

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<sup>10</sup> <http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-nat-frame-communic-disease-control.htm>

Australia. The Department undertakes horizon scanning<sup>11</sup> and disease intelligence fore-sighting activities that includes animal diseases and social, technical and environmental aspects that could affect animal health and the management of animals in Australia in the future. It has been suggested that more liaison and joint risk assessment could be done nationally in peace time in line with other nations such as the UK Human Animal Infections and Risk Surveillance Group<sup>12</sup>. This group aims to provide a 'joined-up' response to emerging diseases that threaten the health of people or animals by horizon scanning, risk assessment, risk management and risk communication.

The Australian Animal Health Laboratory (AAHL) takes a One Health approach to many cross-sector issues, with some recent examples being their research into Hendra, Influenza and Ebola viruses. AAHL is strategically moving to increase collaboration in One Health areas. Another notable consortium is the Geelong Centre for Emergency Infectious Disease<sup>13</sup> that is formed by the City of Greater Geelong, Barwon Health, AAHL and Deakin University.

The Department of Environment has an Australia's Biodiversity Conservation Strategy 2010–2030<sup>14</sup> that encompasses building ecosystem resilience in a changing climate by maintaining and re-establishing ecosystem functions and reducing threats to biodiversity. An example of a potential One Health issue is weeds that affect the environment, contaminate produce and affect animal and human health. Common weeds such as Parthenium, Ragweed, Rye Grass and Privet cause asthma and other respiratory problems, especially in children. Some water weeds such as Water Hyacinth and Cabomba can affect the quality of our drinking water if infestations are not managed within water supply dams.

At the States and Territories level there is often a good level of communication between the government departments responsible for agriculture, human health and the environment.

Wildlife Health Australia takes a One Health approach in its operations.

### 3. AHA Context:

**AHA will seek a One Health approach through national, multidisciplinary partnerships in the broad areas of animal and human health, biosecurity and biodiversity. One Health issues of interest and relevance to AHA include; animal disease preparedness, surveillance and biosecurity, response, sustainable livestock production, trade and market access.**

AHA acknowledges there are several key operational elements that are necessary for effective cross-sectoral collaboration. These elements must be actively supported by all

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<sup>11</sup><http://www.agriculture.gov.au/animal/health/strategy>

<sup>12</sup> [http://www.hse.gov.uk/aboutus/meetings/committees/acdp/140213/acdp\\_100\\_p4d.pdf](http://www.hse.gov.uk/aboutus/meetings/committees/acdp/140213/acdp_100_p4d.pdf)

<sup>13</sup> <http://www.biogeelong.com.au/GCEID.html>

<sup>14</sup> <http://www.environment.gov.au/system/files/resources/d233f869-fae7-4311-89d1-11556179db29/files/biodiversity-strategy-2010-brochure.pdf>

parties in order for a One Health approach to work. This approach cannot be implemented in isolation<sup>15</sup>.

There is no specific funding to support a One Health approach. AHA involvement in One Health initiatives will be determined and supported by the stream or project of most relevance and capability with contributions from preparedness, surveillance, biosecurity or corporate streams as required. New activities and project proposals will be subject to established project documentation and approval process.

The above definition is a subset of OIE and other international statements (appendix A), and is in line with the company's Vision, Mission and Values and the four strategic priorities of the Animal Health Australia Strategic Plan (2015-2020)<sup>16</sup>.

Animal welfare or well-being is acknowledged as a significant component of the animal health area and as such is a relevant aspect of One Health considerations. AHA has a separate policy and position on livestock welfare.

AHA members will benefit directly from a shared approach by way of more and better expertise and resources leading to a more efficient approach to One Health issues.

There are wider social, environmental and economic benefits<sup>17</sup> for industry and government and in terms of beneficial reputation management – this will be achieved by participation in and mutual resolution of a shared health challenge. Demonstration of a responsible, evidence-based, objective approach to a shared One Health issue will lead to an improved government and industry social license in a general sense.

For AHA, and in some circles (depending on their viewpoint), One Health is focussed on diseases and host interactions between humans, animals and wildlife in the environment. However it's important for AHA to consider that other views of One Health approaches include broader ecosystem/conservation issues – i.e. plant health, ecosystem functions (water, plants, soil/nutrient cycles - as enablers of good human health), weeds and pastures (effects on crop productivity and animal feed sources, but also as drivers of wildlife distribution), deforestation, loss of biodiversity, extinction rates, land use changes, impacts on food availability/food security, climate change and its effects on plants/animal distribution –and subsequently, on the types of food sources/habitat available for people and animals. In this sense, One Health can be much broader than simply looking at diseases moving between humans, animals and wildlife.

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<sup>15</sup> WHO-OIE Operational Framework for Good governance at the human-animal interface: <http://www.oie.int/doc/ged/D14066.PDF>.

<sup>16</sup> AHA Strategic Priorities (2015-2020):

1. Effectively manage and strengthen Australia's emergency animal disease response arrangements through successful partnerships with members.
2. Enhance the emergency animal disease capability of AHA and its members.
3. Strengthen biosecurity, surveillance and animal welfare to enhance animal health, and support market access and trade.
4. Deliver member value, organisational performance enhancement and sustainable resourcing.

<sup>17</sup> The triple bottom line: [http://en.wikipedia.org/wiki/Triple\\_bottom\\_line](http://en.wikipedia.org/wiki/Triple_bottom_line)

Under a One Health banner, future AHA collaborations would involve working more closely with trans-disciplinary experts such as social scientists, anthropologists, economists, and environmental psychologists. Building collaborative teams that draw on expertise from outside of the agricultural animal health sector will help AHA and Members to better understand the many systems that agricultural production operates in – and that impact upon production in Australia, and therefore, help us develop alternative solutions to One Health problems affecting the livestock industries.

An example of an industry approach to a one health issue such as anti-microbial resistance can be evidenced in the efforts of the Australian feedlot sector which is increasingly adopting best management practices that reduce cattle stress and related animal health issues and hence the need for antibiotics (such as ensuring cattle are better prepared before entering the feedlot through the use of vaccination and backgrounding, the adoption of low stress stock handling techniques and improved infrastructure and handling during transport and unloading). ALFA is also implementing a range of actions to address the matter including the collation of industry antibiotic treatment information and resistance data along with the implementation of a stewardship program to demonstrate how the industry is using antibiotics prudently.

#### **AHA's current activities with One Health relevance:**

##### **Emergency Animal Disease (EAD) reference group and AUSVETPLANS**

AHA maintains a number of AUSVETPLAN disease strategies for zoonotic EADs including – anthrax, ABLV, AI, Bovine brucellosis, BSE, JE, rabies, screw worm fly, and response policies for Trichinellosis, West Nile Virus and other diseases. The Department of Health is a member of the EAD reference group which oversees any changes to the Emergency Animal Disease Response Agreement (EADRA) and related EAD matters. Any EAD's that are zoonotic are reviewed by the Department of Health's Communicable Disease Network of Australia as part of the development and updating process for AUSVETPLAN disease strategies and response policies. Health will be involved in any EAD response to a degree relevant to the disease agent. Joint working groups exist for rabies preparedness and AI biosecurity standards.

##### **Antimicrobial resistance**

AHA is part of the government-led working group looking at managing antimicrobial resistance (AMR) across the animal and human health spectrums. AMR is an important, emerging One Health issue. The National AMR Strategy<sup>18</sup> will be underpinned by a One Health approach, which provides a coordinated, collaborative, multidisciplinary and cross-sectoral approach to the development of health strategies for people, animals and the environment. The Strategy will guide Australia's efforts across the human and animal health, food and agriculture sectors to prevent and contain AMR, ensure that work is comprehensive and coordinated, and that progress is reviewed and reported on.

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<sup>18</sup> <http://www.agriculture.gov.au/animal/health/amr>

**Market Access Services - National Animal Health Information System (NAHIS) and the Animal Health Surveillance Quarterly (AHSQ)**

Data for eleven zoonoses in animals and five zoonoses in humans as well as chemical residues in meat (of potential concern to human health) are reported to NAHIS and through the AHSQ to animal and human health agencies. General surveillance efforts, including NSDI, have a focus on timely detection of new diseases that may be zoonotic and/or have wildlife and environmental impacts. AHA participates in Wildlife Health Australia Coordination Group on general surveillance where a One Health approach is demonstrated.

AHA participates in the Departments of Agriculture, Environment, & Health dialogue meetings.

**Biosecurity**

The Biosecurity activities conducted by AHA promote whole of farm biosecurity in the context of human, animal and plant disease and pest risk mitigations. Furthermore, under the Biosecurity Research, Development and Extension Strategy (2015-2020) managed by AHA, we engage with agricultural, veterinary and human health research and extension organisations to identify both gaps and areas of potential greater R&D collaboration.

**Livestock Production Conditions**

This project has a potential One Health aspect for the sheep industry endemic disease management and includes the national Sheep Health (abattoir) monitoring project that reports on a number of zoonoses. Other livestock species will be included. The One Health approach will be taken as relevant.

**Attachment B: Further useful reference documents on One Health**

1. **Summarising the FAO-OIE-WHO-UNICEF strategic document ‘Contributing to One World, One Health: a strategic Framework for Reducing Risks of Infectious Diseases at the Animal–Human–Ecosystems Interface’ (2008)**, OIE<sup>19</sup> highlighted that key elements of effective (disease) prevention programmes in both animal and public health include:

- Adequate infrastructure and expertise at national and local levels, and at entry points
- Timely and responsive disease surveillance systems for animal and human populations
- Up-to-date emergency preparedness and response plans
- Capacity for communication of level of risk
- Capacity to apply international agreements and standards
- Continuous evaluation and improvement of biosecurity
- Governance and legislation in line with international standards
- Adequate and sustainable laboratory capacity supported by external quality assurance systems
- Established monitoring and evaluation systems for Veterinary and Public Health Services
- A legal framework with incentives through co-operation with the private sector
- A communication protocol between animal and public health surveillance systems

2. **The FAO-OIE-WHO Tripartite Concept Note<sup>20</sup> (April 2010)** envisions “A world capable of preventing, detecting, containing, eliminating, and responding to animal and public health risks attributable to zoonoses and animal diseases with an impact on food security through multi-sectoral cooperation and strong partnerships.”

3. **The Manhattan Principles on “One World, One Health”**, September 2004.

Recent outbreaks of West Nile Virus, Ebola Haemorrhagic Fever, SARS, Monkey pox, Mad Cow Disease and Avian Influenza remind us that human and animal health are intimately connected. A broader understanding of health and disease demands a unity of approach achievable only through a consilience of human, domestic animal and wildlife health -One Health. Phenomena such as species loss, habitat degradation, pollution, invasive alien species, and global climate change are fundamentally altering life on our planet from terrestrial wilderness and ocean depths to the most densely populated cities. The rise of

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<sup>19</sup> [http://www.oie.int/fileadmin/Home/eng/Publications\\_%26\\_Documentation/docs/pdf/bulletin/Bull\\_2009-2-ENG.pdf](http://www.oie.int/fileadmin/Home/eng/Publications_%26_Documentation/docs/pdf/bulletin/Bull_2009-2-ENG.pdf)

<sup>20</sup> [http://www.who.int/influenza/resources/documents/tripartite\\_concept\\_note\\_hanoi\\_042011\\_en.pdf](http://www.who.int/influenza/resources/documents/tripartite_concept_note_hanoi_042011_en.pdf)

emerging and resurging infectious diseases threatens not only humans (and their food supplies and economies), but also the fauna and flora comprising the critically needed biodiversity that supports the living infrastructure of our world. The earnestness and effectiveness of humankind's environmental stewardship and our future health have never been more clearly linked. To win the disease battles of the 21st Century while ensuring the biological integrity of the Earth for future generations requires interdisciplinary and cross-sectoral approaches to disease prevention, surveillance, monitoring, control and mitigation as well as to environmental conservation more broadly.

We urge the world's leaders, civil society, the global health community and institutions of science to:

1. 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.
2. Recognize that decisions regarding land and water use have real implications for health. Alterations in the resilience of ecosystems and shifts in patterns of disease emergence and spread manifest themselves when we fail to recognize this relationship.
3. Include wildlife health science as an essential component of global disease prevention, surveillance, monitoring, control and mitigation.
4. Recognize that human health programs can greatly contribute to conservation efforts.
5. Devise adaptive, holistic and forward-looking approaches to the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases that take the complex interconnections among species into full account.
6. Seek opportunities to fully integrate biodiversity conservation perspectives and human needs (including those related to domestic animal health) when developing solutions to infectious disease threats.
7. Reduce the demand for and better regulate the international live wildlife and bushmeat trade not only to protect wildlife populations but to lessen the risks of disease movement, cross-species transmission, and the development of novel pathogen-host relationships. The costs of this worldwide trade in terms of impacts on public health, agriculture and conservation are enormous, and the global community must address this trade as the real threat it is to global socioeconomic security.

8. Restrict the mass culling of free-ranging wildlife species for disease control to situations where there is a multidisciplinary, international scientific consensus that a wildlife population poses an urgent, significant threat to human health, food security, or wildlife health more broadly.

9. Increase investment in the global human and animal health infrastructure commensurate with the serious nature of emerging and resurging disease threats to people, domestic animals and wildlife. Enhanced capacity for global human and animal health surveillance and for clear, timely information-sharing (that takes language barriers into account) can only help improve coordination of responses among governmental and nongovernmental agencies, public and animal health institutions, vaccine / pharmaceutical manufacturers, and other stakeholders.

10. Form collaborative relationships among governments, local people, and the private and public (i.e. non-profit) sectors to meet the challenges of global health and biodiversity conservation.

11. Provide adequate resources and support for global wildlife health surveillance networks that exchange disease information with the public health and agricultural animal health communities as part of early warning systems for the emergence and resurgence of disease threats.

12. Invest in educating and raising awareness among the world's people and in influencing the policy process to increase recognition that we must better understand the relationships between health and ecosystem integrity to succeed in improving prospects for a healthier planet.

It is clear that no one discipline or sector of society has enough knowledge and resources to prevent the emergence or resurgence of diseases in today's globalized world. No one nation can reverse the patterns of habitat loss and extinction that can and do undermine the health of people and animals. Only by breaking down the barriers among agencies, individuals, specialties and sectors can we unleash the innovation and expertise needed to meet the many serious challenges to the health of people, domestic animals, and wildlife and to the integrity of ecosystems. 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.

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<http://www.oneworldonehealth.org/>

***For examples of the benefits of One Health approaches (important for ‘selling the idea’ and gaining buy-in, to demonstrate the value of One Health):***

- World Bank (2012). *People, Pathogens and Our Planet: The Economics of One Health*. Washington, DC. Available online: <https://openknowledge.worldbank.org/handle/10986/11892>
  - Look specifically at: [Ch. 7 Efficiency Gains](#) from One Health, and [Ch. 8 Effectiveness Gains](#) (particularly [Table 8.1, pg. 28](#) for published case studies showing benefits of closer coordination between human and animal health sectors)
- One Health for One World: [A compendium of Case Studies from Veterinarians without Borders](#) (April 2010)

***For further info on One Health and the inclusion of plants, weeds and environmental issues:***

- Romanelli C et al (2014). The integration of biodiversity into One Health. *Rev. sci. tech. Off. Int. Epiz.*, 33 (2), 487-496. Available online: <http://www.oie.int/doc/ged/D14083.PDF>
- Weeds See more: <http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/why/impact.html>
- Plant Food Safety Issues: Linking Production Agriculture with One Health. <http://www.ncbi.nlm.nih.gov/books/NBK114507/>
- Understanding One Health and its relationship to biodiversity. <http://www.hphpcentral.com/article/understanding-one-health-and-its-relationship-to-biodiversity>
- WHO-OIE Operational Framework for Good governance at the human-animal interface: <http://www.oie.int/doc/ged/D14066.PDF>