High-Level Technical Meeting to Address Health Risks at the Human-Animal-Ecosystems Interfaces

Mexico City, Mexico

15-17 November 2011

WHO

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COMMENTS FROM THE SECRETARY OF HEALTH OF MEXICO ON BEHALF OF THE HOST COUNTRY

At the opening session of the High Level Technical Meeting to Address Health Risks at the Human–Animal–Ecosystem Interface (HLTM), the Secretary of Health of Mexico, Mr Salomón Chertorivski, welcomed the participants and expressed his gratitude for all the effort and support of the Tripartite organizations in the designing and development of this HLTM. He pointed out that the recent influenza pandemic had left us with many lessons learnt, mostly the urgent need to address zoonotic diseases in a broader and more coordinated manner among all government sectors and society to reduce the risks of economic hardship resulting from unjustified interference with trade and international transport.

The pandemic also highlighted the importance of improving our surveillance systems and finding ways to share information across sectors in a timely manner. He also addressed the importance of having consented risk communication protocols to ensure better coordination with and response from society.

Mr Chertorivski pointed out that the fragmentation of the governmental structure is a critical barrier to joint action between the technical and political entities responsible for human and animal health. Therefore, he called for the designing of a long-term perspective that would facilitate for the development of joint objectives and efforts. He said that Mexico is pleased to share successful experiences and challenges to help drive the global agenda toward a joint approach to health risks at the human, animal, and wildlife ecosystem interface. He recalled that the HLTM stems from valuable initiatives, such as the International Ministerial Conference on Avian and Pandemic Influenza (known by its acronym, IMCAPI, in English), and wishes to continue with the efforts to establish the methodological basis for identifying the guiding principles for linking the areas of human, animal, and wildlife ecosystems that support the integrated management of health problems.

He also expressed his gratitude to the Secretary of Agriculture, Livestock, Fisheries and Food (SAGARPA) and to the Secretary of Environment and Natural Resources (SEMARNAT) of Mexico for co-hosting the meeting, and expressed his commitment to continuing working together on a common front to address zoonotic diseases. Finally, he wished everyone a very successful and productive meeting.

FOREWORD

Collaborative multidisciplinary work on the health of humans, animals, and ecosystems reduces the risk of diseases at the interfaces between them. This is often referred to as the 'One Health' vision.

Such cross-sectoral working often presents challenges: it calls for systems that make the One Health vision come to life and the careful investment of time to make the systems work. The time must be used well – to build trust, innovate, learn lessons, and establish sustainable ways of working. Adequate resources are needed to make this happen: if the funds needed for close working together are not available, collaboration will not materialize. Implementing the vision means going beyond the efforts of the few who are committed to the cause. I anticipate that – within the next five years – practitioners within each of the relevant disciplines will be skilled in the One Health approach: their skills will be tested within their professional examinations.

International organizations are focusing on the One Health vision. The Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE), and the World Health Organization (WHO) launched their Tripartite Concept Note in April 2010 at the International Ministerial Conference on Animal and Pandemic Influenza in Hanoi, Vietnam. The Tripartite recognized the need for a supportive environment in which ministers responsible for different sectors within national governments, together with stakeholders from professional associations, regional organizations, and donor agencies, establish consensus on the best ways for working on health risks at the interface.

This report reflects the significant work undertaken during an international High-Level Technical Meeting to Address Health Risks at the Human–Animal–Ecosystem Interface (HLTM) on the One Health approach that took place from 15 to 17 November 2011 in Mexico City. It was hosted by Mexico and convened by the Tripartite, with the support of the United Nations System Influenza Coordination (UNSIC).

Participants in the meeting identified both 'supporting' elements that enable collaborative work on the One Health approach and 'operational' elements that reflect the attributes of successful collaborations. Participants also identified impediments to success and considered how they could best be overcome.

After the meeting, the HLTM Steering Committee proposed priority actions for advancing the One Health agenda. The Steering Committee members agreed that policy-makers need to know about the benefits and costs of different cross-sectoral approaches to help them decide how best to implement them.

The technical and policy outcomes of the HLTM complement other pioneering work on One Health in recent years. More and more countries are exploring the One Health approach and are implementing it in different ways. I am personally delighted that governments and other stakeholders are moving this agenda forward with support from FAO, WHO, OIE, and the World Bank: I am pleased that the HLTM has made a substantive contribution to the process.

David Nabarro
United Nations Secretary-General's Special Representative for Food Security and Nutrition,
United Nations System Coordinator for Avian and Pandemic Influenza

EXECUTIVE SUMMARY

BACKGROUND

Health threats at the human–animal–ecosystem interface have increased over the past decades, as pathogens continue to evolve and adapt to new hosts and environments, imposing a burden on human and animal health systems. The increase in health threats to humans and animals is driven by multiple, inter-related global factors generally related to human behaviour and environmental changes and also reflects the complexities of the ecosystems in which humans and animals coexist. Because reducing these risks cannot be achieved by one sector alone, there is increasing convergence toward a One Health approach that incorporates a collaborative, cross-sectoral, multidisciplinary mode of addressing these threats and reducing health risks.

Building upon the principles and areas of joint work captured in the FAO–OIE–WHO Tripartite Concept Note, 'The FAO–OIE–WHO Collaboration – Sharing responsibilities and coordinating global activities to address health risks at the animal–human–ecosystems interfaces,' the Tripartite partnership of FAO, WHO, and OIE has made a commitment to jointly address the risks at the interface. In the Concept Note, the Tripartite recognizes the need to establish an environment in which ministers representing the various sectors within countries can voice their expectations and come to a consensus on future activities, particularly collaborative ones. Ensuring a high-level technical perspective on the issues was seen by the Tripartite and global partners to be critical to formulating the rationale and arguments that would effectively engage ministers in such a discussion.

ORGANIZATION AND APPROACH TO THE HIGH-LEVEL TECHNICAL MEETING TO ADDRESS HEALTH RISKS AT THE HUMAN-ANIMAL-ECOSYSTEM INTERFACE (HLTM)

In conceiving the HLTM, the Tripartite and Mexico, supported by the United Nations System Influenza Coordination (UNSIC), provided a venue for stakeholders from the national health, agriculture, and environmental sectors and from technical, regional, and donor organizations to contribute their perspectives and expertise to discussions of mutual priority health issues at the human–animal–ecosystem interface – especially those that would be of interest to ministers. Participants from the different sectors considered and came to agreement on cross-sectoral technical and policy approaches to address the mutual priorities and on the next steps for moving forward to implement these approaches.

Three topics – zoonotic influenza, rabies, and antimicrobial resistance (AMR) – were used as 'entry points' for participant discussions, as each offers successful and beneficial examples of cross-sectoral collaboration, and the themes of risk assessment and risk mitigation were the lens through which the topics were examined. The HLTM was organized into opening and plenary sessions, facilitated working group sessions, and panel discussions from which came the major HLTM outcomes – key elements of effective cross-sectoral collaboration – along with specific actions and concrete next steps. These key elements could be used by countries when considering the establishment of national cross-sectoral approaches, and are described in detail in this report.

KEY ELEMENTS OF EFFECTIVE CROSS-SECTORAL COLLABORATION

Key supporting elements

1 Political will and high-level commitment
2. Trust
3. Common objectives and priorities
4. Shared benefits
5. Strong governance structures, aligned legal frameworks, and recognition of existing international standards
6. Adequate and equitably distributed resources
7. Identification and involvement of all relevant partners
8. Coordinated planning of activities
9. Guidance on implementation of cross-sectoral collaborations
10. Capacity development
11. Strong and effective health systems within the individual sectors

Key operational elements

A. Joint cross-sectoral coordination mechanisms
B. Routine communication
C. Joint simulation exercises
D. Data sharing
E. Joint risk assessment
F. Active cooperation on disease control programmes

WHAT'S NEXT? A STRATEGIC VISION FOR POST-HLTM ACTIONS

The HLTM was partly envisioned to provide a technical basis for a joint Ministerial Conference, described in the Tripartite Concept Note, but there was overall agreement that certain interim activities would need to take place before such an inter-ministerial meeting could be most useful. Potential priorities, approaches, and next steps identified at the HLTM by the Tripartite and the Steering Committee members fell under three interconnected headings:

1. Develop and deliver clear messages

During the HLTM it emerged that exactly what the global community hopes to achieve by taking cross-sectoral approaches to collaborative work at the human–animal–ecosystem interface was at times unclear, even among some of the meeting participants. It was agreed that the outcomes of the HLTM would be translated into standard cross-sectoral tools and that clear policy messages would be developed and widely distributed.

2. Develop a clear plan for building cross-sectoral approaches into existing standards and tools and investing in existing systems

Identifying practical cross-sectoral actions was a main theme of the HLTM. Plans to apply cross-sectoral approaches – specifically those described in the key operational elements – could be developed at all administrative levels. Further, it was agreed that incorporating cross-sectoral approaches into existing mechanisms and structures was more efficient than creating new ones.

3. Define and describe costs and benefits of cross-sectoral approaches

During the HLTM, it was clearly noted that coordinated, cross-sectoral approaches and interventions could offer increased efficiency and effectiveness – and at the same time it was noted that, while intuitively obvious and backed up with some strong examples, further economic efficiency analyses are needed. Partners noted the importance of evaluating the economic impact of adopting cross-sectoral approaches to address health issues to ensure that evidence is provided to policy-makers to make appropriate decisions.

CONCLUSIONS

As presented within the objectives for this meeting, FAO, OIE, and WHO sought to conduct a the HLTM to advance the implementation of One Health approaches in countries and complement the other meetings that have taken place on this subject. A main outcome was the identification of key supporting and operational elements of effective cross-sectoral collaboration to address health risks at the human–animal–ecosystem interface. The HLTM provided an important contribution in advancing our ability to address risks at the interface. The full achievement of the meeting objectives was, and will continue to be, interlinked with the continued collaboration between the Tripartite organizations and their partners in these efforts – partners that include other international actors, regional and national governments, and non-governmental and academic partners, including in some cases establishing public–private partnerships. Each entity has an important role to play and often has a slightly different group of stakeholders or methods of reaching common stakeholders. Harnessed, the combined roles of these various partners should be adequate to ensure fundamental progress toward broadly implementing cross-sectoral approaches to health issues at the human–animal–ecosystem interface.

MEETING REPORT

BACKGROUND

Health threats at the human–animal–ecosystem interface have increased over the past decades. Some diseases such as acquired immune deficiency syndrome, pandemic influenza, and severe acute respiratory syndrome have emerged from animal hosts and become human pathogens. Others such as chikungunya, zoonotic influenza, and Rift Valley fever pose sporadic zoonotic threats. Endemic diseases such as rabies, brucellosis, and leptospirosis continue to have substantial health impacts in both animals and people. The frequent identification of pathogens with resistance to antimicrobial agents decreases our ability to successfully treat some bacterial infectious diseases in both animals and people. All of these are examples of how pathogens continue to evolve and adapt to new hosts and environments and will likely continue to be a burden to human and animal health systems. More can be expected in the future.

The increase in health threats to humans and animals is driven by multiple, inter-related global factors generally related to human behaviour and environmental changes and also reflects the complexities of the ecosystems in which humans and animals coexist. Animal diseases can have a major impact on public health, national and regional economies and households, and, in the specific case of pandemic threats, even on global societal stability and security. The recent efforts to control zoonotic H5N1 highly pathogenic avian influenza (HPAI) and contributions toward pandemic preparedness reflect the need to reduce the risks associated with zoonotic pathogens and diseases of animal origin. Reducing these risks cannot be done by one sector alone; however, most country control systems are still not aligned among sectors and there tends to be limited collaborative work between relevant structures and disciplines. Therefore, the international community, together with countries, is increasingly converging toward a One Health approach that incorporates a collaborative, cross-sectoral, multidisciplinary mode of addressing threats and reducing health risks at the human–animal–ecosystem interface.

The large and ever-increasing number of national, regional, and international meetings being organized under the One Health umbrella serves as testament to the importance and growing acceptance of this approach when addressing issues at the human–animal–ecosystem interface. The approach is being built on the International Ministerial Conference on Avian and Pandemic Influenza (IMCAPI) process, a wide variety of other meetings related to One Health, and a series of strategic documents developed by the

FAO, OIE, and WHO, and other key partners such as the World Bank, the United Nations System Influenza Coordination (UNSIC), and the United Nations Children's Emergency Fund (UNICEF). The IMCAPI meeting series, and most other international policy-oriented meetings on One Health and cross-sectoral approaches, have been mainly focused on avian and pandemic influenza. These meetings and their output declarations have been instrumental in promoting global awareness of the economic impacts of avian influenza, the threat of pandemic influenza, and the benefits of joint action, and have also served as the platform for the start of broader One Health discussions.

The IMCAPI meetings used the concrete technical challenge of influenza at the human–animal interface to bring important new and existing funding partners to the table and facilitated crucial conversations about how the sectors needed to work together better. At the IMCAPI meetings, technical reviews of issues related to influenza and the work the sectors were doing – individually and together – were presented, combined with updates on global activities and the associated financial implications. Discussions took place at a high policy level, and funding partners often pledged contributions to the process over the course of the meetings. The IMCAPI meetings set strategic and policy objectives but did not aim to provide specific approaches or tools for achieving them.

Each meeting of the IMCAPI process provided important contributions to the broader One Health effort (see Annex 1, Selected international One Health-related meetings). In 2007, the rather visionary concept of 'One World, One Health[1]' was highlighted as contributing to pandemic preparedness and human health security. In 2008, an Interagency Strategic Framework 'Contributing to One World, One Health – A strategic framework for reducing risks of infectious diseases at the animal–human–ecosystems interface', developed by UNSIC, FAO, OIE, WHO, UNICEF, and the World Bank, was officially released. The IMCAPI meeting in 2010 in Hanoi was a key milestone for One Health, as it represented a more global shift toward, and acceptance of, cross-sectoral policy and coordination to deal with serious threats at the human–animal–ecosystem interface and was the venue for the release of both the FAO–OIE–WHO Tripartite Concept Note 'The FAO–OIE–WHO Collaboration – Sharing responsibilities and coordinating global activities to address health risks at the animal–human–ecosystems interfaces' (Annex 2) and the UNSIC/World Bank Global Progress Report Framework for Sustaining Momentum of the Work of Animal and Pandemic Influenza.

Parallel to the IMCAPI process, other meetings were also contributing to the development of the One Health approach from a policy or scientific perspective (Annex 1). A seminal meeting took place in 2004, from which 'The Manhattan Principles' emerged, a list of 12 recommendations for establishing a more holistic approach to preventing epidemic/

1 'One World, One Health' is a registered trademark of the Wildlife Conservation Society.

epizootic disease and for maintaining ecosystem integrity. These principles laid the modern foundation for much of the current One Health 'movement.' Additional meetings followed, for example in Winnipeg in 2009 and in Stone Mountain in 2010. Each of these meetings moved the conceptual policy framework provided by the internationally developed guidance further towards operationalization. Each examined potential avenues for operationalization into policy actions, for example through activities, networking, or both combined.

To complement the policy development occurring over this period, technical meetings were also examining the scientific underpinning of One Health. Similar to their policy counterparts, these technical meetings built upon the basis of avian and pandemic influenza and progressively expanded to a broader scope of scientific issues related to health risks at the human–animal–ecosystem interface. These also took a broader perspective than other individual disease-focused meetings, some of which have always included multisectoral participation. These meetings, for example the FAO–OIE–WHO scientific consultations in Verona (in 2008 and 2010) and the International One Health Congress in Melbourne in 2011, provided a deeper understanding of the technical issues at the interface and the scientific principles that could be applied to reducing the associated health risks.

The contributions from these meetings continued to move the world closer to understanding and accepting cross-sectoral approaches. As an added benefit, participants also started to develop functional working relationships and collaborative technical activities, which facilitated further collaborative work and contributed to the positive global momentum of the One Health vision. Evidence that the implementation of One Health approaches has made concrete progress in the years since the onset of the avian influenza crisis can be found in the degree of cross-sectoral collaboration during the response to the 2009–2010 influenza pandemic at the global, regional, national, and community level. Responding jointly to crises affecting multiple sectors is a recognized necessity and becoming increasingly adopted as the norm. However, the trust and systems building that happen outside of these crises and which are necessary for the development of routine cross-sectoral practices are making progress at a slower pace.

The Tripartite vision and the high-level technical meeting

At the international level, the Tripartite partnership of FAO, WHO, and OIE has made a commitment to address jointly the risks at the animal–human–ecosystem interface. The areas that the Tripartite is focusing on to implement One Health approaches are captured in the 2010 Tripartite Concept Note. This Tripartite Concept Note has become the touchstone for all Tripartite work together, as it sets a strategic direction for FAO, OIE, and

WHO to take together and proposes a long term basis for international collaboration aimed at coordinating global activities to address health risks at the human–animal–ecosystem interface. Common areas of work that the Tripartite organizations can build upon are outlined in the Concept Note, and include normative work, public communication, and promoting pathogen detection, risk assessment, and management, technical capacity building and research development, and development of common protocols and standards, when appropriate. The value of improvements in governance, combined with infrastructure and capacity building within and among all sectors, is highlighted.

In the Concept Note, the Tripartite also recognizes the need to establish an environment in which ministers representing the various sectors within countries can voice their expectations and come to a consensus on future activities. In reviewing the outcomes of the previous meetings in the context of the Tripartite individual organizational mandates and the Tripartite role itself, this aspect – engaging the ministerial level in member countries and providing ministers with a rationale and the practical tools to facilitate implementation of these cross-sectoral concepts to address health issues at the human–animal–ecosystem interface in their countries – was identified as not having been specifically addressed in previous meetings. Ensuring a high-level technical perspective on the issues was seen to be critical to formulate the rationale and arguments that would effectively engage ministers in such a discussion.

The High Level Technical Meeting to Address Health Risks at the Human- Animal-Ecosystem Interface (HLTM) was conceived as a venue for stakeholders from the national health, agriculture, and environmental sectors and from technical, regional, and donor organizations to contribute their perspectives and expertise to discussions of mutual priority health issues – especially those that would be of interest to ministers. Participants from the different sectors considered and came to agreement on cross-sectoral technical and policy approaches to address the mutual priorities and on the next steps for moving forward to implement these approaches.

Organization and approach to the HLTM

The HLTM, hosted by Mexico and convened by the Tripartite with the support of UNSIC, took place from 15 to 17 November 2011 in Mexico City. The approximately 85 invited participants represented the Tripartite, UNSIC, the Ministries of Health, Agriculture, and Environment of Mexico, and the World Bank, as well as government, academia, funding partners, and regional representations from Australia, Belgium, Brazil, Canada, France, Germany, Ghana, India, Indonesia, Italy, Japan, Kenya, Malaysia, Namibia, Nigeria, the Philippines, the Russian Federation, Switzerland, Trinidad and Tobago, the United

Kingdom, the United States of America, and Viet Nam. Participants from governments were generally high-level technical staff. These participants were invited both to bring the views of their ministries and their countries into the technical and policy discussion and also to communicate the results back to their ministers. Technical experts were invited to provide specific expertise to the discussions. The size and composition of the meeting achieved a balance between broad geographic and sector representation and the ability to have effective dialogue.

The meeting was organized into opening and plenary sessions, facilitated working group sessions, and panel discussions (Annex 3, HLTM agenda). The plenary speakers provided background on the ongoing work on cross-sectoral collaboration globally and nationally. The working groups enabled the participants to share their views and experiences and produced the major outcomes from the HLTM – overarching cross-sectoral collaboration needs, specific actions, and concrete next steps – that were discussed at length in plenaries and summary sessions. Three topics – zoonotic influenza, rabies, and antimicrobial resistance (AMR) – were used as 'entry points' for these discussions, as each offers successful and beneficial examples of cross-sectoral collaboration, and the themes of risk assessment and risk mitigation were the lens through which the topics were examined. The meeting was followed immediately by a final session attended by members of the HLTM Secretariat and Steering Committee to extract the main outcomes from the discussions and identify the logical next steps for the international partners present.

SUMMARY OF THE TECHNICAL PARTS OF THE MEETING

Opening

The Minister of Health of Mexico, Mr Salomón Chertorivski, inaugurated the meeting, pointing out the importance of the work at the human–animal–ecosystem interface and recognizing that success in this area would require political will. He cited Mexico as an example where cross-sectoral collaboration already exists.

The Undersecretary of Prevention and Health Promotion at the Ministry of Health, Dr Mauricio Hernandez, also welcomed the participants on behalf of the representatives of the co-hosting organizations, the Mexican Ministry of Environment (Dr Mauricio Limon) and Ministry of Agriculture (Dr Enrique Sanchez-Cruz). He proposed that the spread of infectious diseases at the human–animal–ecosystem interface demands that we re-examine our ways of approaching diseases to take account of sustainable development and the essential collaboration between sectors and nations. He stressed that fighting zoonoses requires harmonization of international partners' efforts and that the Tripartite Concept Note provides a basis for such harmonization.

Dr Hernandez emphasized certain areas requiring collaboration among sectors, including the timely sharing of information as a prerequisite to enable early warning and early response, surveillance systems that monitor and analyse risks, and capacity development, training, and research that should be integrated into efforts to strengthen systems. He expressed the high level of interest of the Government of Mexico in this meeting and its outcomes, adding that it was seen as a good opportunity to foster interaction among experts in the main three sectors involved (animal, human, and ecosystem).

In this opening session, the Tripartite organizations were represented by Dr Keiji Fukuda, Assistant Director General for Health Security and Environment, WHO, Dr Berhe Tekola, Director of Animal Production and Health Division, FAO, and Dr Bernard Vallat, Director General, OIE. They expressed gratitude to the Mexican government for the invitation and to the Mexican people for the warm welcome. They reinforced the commitment of their organizations to work together to improve cross-sectoral collaboration among the human health, animal health, and environmental sectors and also to advance cooperation among nations. They also stressed that the Tripartite is committed to improving policies to support national authorities' work at the interface and acknowledged the complexity of advancing the One Health agenda globally, while recognizing the need for a common strategic vision, and new approaches, policies, and solutions, to move forward in a harmonized way. Finally, the Tripartite representatives expressed hope that this HLTM would facilitate political commitment by providing ideas and proposing actions that need political support and bringing them to the attention of policy-makers.

Plenary presentations

Individuals working in different sectors, different countries, and different communities have different perspectives on One Health and what cross-sectoral collaboration looks like in practice. Plenary presentations aimed to harness these perspectives, to provide a common understanding of the recent One Health history, and to frame the approach to be taken to the HLTM discussions. The landscape for cross-sectoral collaboration was provided through a presentation summarizing previous One Health discussions and their main outcomes and one providing practical examples of cross-sectoral collaboration, including key actions. Two additional speakers focused on examples at the national level: one described the establishment of a national interagency One Health task force; and the other described a national cross-sectoral collaboration in assessment of risk at the human–animal interface. The details of these presentations are provided in the text boxes.

BOX 1

One Health: vision, challenges and progress

Dr Carol Rubin, Centers for Disease Control and Prevention, United States

One Health is the interdependence of human, animal, and environmental health. The foundation of the One Health paradigm is cross-sectoral communication, collaboration and trust. The broad vision of One Health also encompasses other disciplines that impact human health, such as economics, food security, and food safety. The story of developing a new Rift Valley fever vaccine for animals to protect against human disease presents a potential One Health success story. It also illustrates the challenges in terms of lack of communication between experts in the environment, animal, and human sectors and the different mandates of each sector, as well as the fundamental question of which sector pays for an animal vaccine to prevent human disease. However, some progress is being made to overcome these challenges.

Progress includes follow-up on ongoing activities from the 2010 Stone Mountain meeting on operationalizing One Health. The seven working groups that were formed during that meeting are all active, all have added many members, several have secured external funding to conduct follow-up activities, most hold regularly scheduled conference calls, several have allied with parts of the United States Agency for International Development Emerging Pandemic Threats project, all have formed individual 'networks,' and most have recognized the compelling need for a 'network of networks' that connects One Health activities and communities.

We are in a period of opportunity for enhancing coordination among the human, animal, and environmental sectors, with an unanticipated international escalation of One Health activities. The influenza pandemic preparedness and response provided a substantial foundation for One Health activities, and it is now time to expand this base to include other zoonotic pathogens that impact human and animal health.

BOX 2

'One Health': practical examples of cross-sectoral collaboration, key actions, and beyond

Professor Jakob Zinsstag, Swiss Tropical and Public Health Institute, Switzerland

The Department of Epidemiology and Public Health at the Swiss Tropical and Public Health Institute has long-standing partnerships with institutions in eight countries in Africa and Central Asia. A special focus on health systems for mobile pastoralists and the control of various zoonotic diseases in developing countries, including bovine tuberculosis, rabies, brucellosis, anthrax, and avian influenza, has been developed.

A brief history of integrative thinking in medicine was provided, including the strong interest in comparative medicine of Rudolf Virchow and the 'one medicine' developed by Calvin Schwabe, based on his work with Dinka pastoralists in Sudan in the 1960s. The operational definition of 'One Health' was given as anything that adds value to the health of animals and humans, results in economic savings, and is not achievable without the cooperation between human and veterinary medicine. Practical examples of work conducted on brucellosis in Mongolia were provided, in which interventions through cost-sharing resulted in benefits for public health, agriculture, and the society at large. A further study on the comparative costs of controlling rabies by mass vaccination of dogs in N'Djaména, Chad, showed that combining dog vaccinations with human post-exposure prophylaxis is less costly than post-exposure prophylaxis alone beyond six years of intervention.

In mobile pastoralist communities in Chad mixed teams of medical doctors and veterinarians providing joint human and animal vaccination services improved access to health care for pastoralists by sharing infrastructure, cold chain, and staff costs. Joint human and animal sero-prevalence studies of zoonotic diseases in nomadic pastoralists and their livestock conducted in Chad and Kyrgyzstan provided new insights and allowed direct identification of the main animal reservoir. The example of Q-fever in the Netherlands illustrated how a lack of communication between the veterinary and public health sectors can negatively influence the early detection of and rapid response to an emerging disease. The presenter called for 'One Health' to become mainstream and not a new discipline and suggested that communication and cooperation between human and animal health specialists should become the norm and could provide over US$6 billion savings, as estimated by the World Bank. Moving beyond 'One Health' would lead to 'Health in Social–Ecological Systems,' which would add value and synergism by taking a systemic approach and by identifying overall societal, economic, and ecosystem benefits from closer cooperation among all sectors. In addition, participatory transdisciplinary approaches enable the definition of policy priorities by consulting the population concerned, scientists, as well as decision-makers.

The presentation was finalized with the following questions relating to how to provide health to a 2000 watt society: how to address persistent or re-emerging infectious diseases when there is a lack of environmental sanitation; the trade-off between health care and menacing malnutrition; the human resource (staff) crisis in human and animal health; how to control transboundary diseases if surveillance systems are inadequate and barely operational; how to control communicable diseases if available funds keep being diverted by corrupt authorities; and how to bridge the huge gap between knowledge and its application, both in human and in animal health.

BOX 3

National cross-sectoral collaboration in assessment of risk at the human–animal interface

Dr Dilys Morgan, Health Protection Agency, United Kingdom

A multisectoral approach to identifying and assessing the risks of emerging and potential zoonotic threats to public health is undertaken in the United Kingdom by the Human–Animal Infections and Risk Surveillance (also known as HAIRS) group. This multidisciplinary group has been operating since 2004 and meets every month, and it acts as a forum to identify and discuss emerging and potentially zoonotic infectious threats, both nationally and internationally, that may affect the United Kingdom population. It reports directly to the Chief Medical Officer's Panel for New and Emerging Infections and other high-level national zoonoses and animal diseases groups and plays an increasingly pivotal role in human and animal health by contributing to national policy development and operational responses on zoonoses. The group mainly deals with non-foodborne zoonoses and picks up areas not covered by established working groups but will ensure that the relevant groups are aware of potential risks.

Members are from government departments and agencies responsible for public health, the environment and animal health, and food standards/safety from across England, Scotland, Northern Ireland and Wales. Activities include horizon scanning for detection of events and identification of the hazards themselves, as well as risk assessment, management, and communication.

A range of risk assessment processes have been developed. These include algorithms for assessing the potential zoonoses and the risk from new or emerging infections. The algorithmic approach allows the risk to be communicated in a transparent, systematic, and objective way, records gaps in knowledge and assumptions, and promotes risk-informed decision-making. Documenting the use of an algorithm can also provide a record for decisions, ensuring that they are easy to explain and justify.

The HAIRS group advises on risk management, but often it is more appropriate for other groups to take responsibility for developing and implementing the risk management aspects. Timely risk communication using robust and consistent terms is key. The group communicates potential threats to a variety of partners and stakeholders through routine monthly summaries and ad hoc reports. If a potential zoonotic risk is identified, joint statements are developed and used by the departments and agencies, ensuring that consistent messages are given out across government.

Members of the group each have professional contacts, collaborators, and networks, but the group has established a close working relationship and trust. They have each committed to the risk assessments and risk output statements, allowing the work to be truly joint. HAIRS meetings are scheduled whether or not there are incidents to discuss, to maintain the contacts and relationships. The size of the groups, level of expertise, mutual respect, and consistency of membership is important. Other lessons learned in establishing this cross-sectoral group include: (1) relationships are best developed and fostered ahead of any crisis; (2) high-level buy-in and support – including funding – are required; and (3) breaking out of sectoral 'silos' is difficult when they are well funded and established.

HAIRS is an example of national cross-sectoral collaboration to assess zoonotic risks at the human–animal–ecosystem interface that has been proven to be sustainable and provide benefits to the country. Such a group will always encounter the challenges of ego, hidden agendas, lack of time, and the simple problems inherent in assessing and communicating risk. However, the group is increasingly being recognized as providing a critical, multidisciplinary focal point for effectively addressing risk assessment, management, and communication of potential zoonotic events, especially those not fitting into existing national structures.

BOX 4

Implementing One Health in the United States Department of Agriculture: moving from forming, storming, and norming to performing

Dr Joseph F. Annelli, United States Department of Agriculture, United States

In 2009, the US Department of Agriculture's Veterinary Services refocused its mission to emphasize its integral role in One Health. This included:

– coordinating with public health and other agencies to detect and respond to zoonotic agents

– using partnerships to incorporate an animal health perspective on the ecology and epidemiology of agents that affect animals, humans, and the environment

– refining collaboration with partner agencies and organizations.

The US Department of Agriculture's first step was to secure public and political support for this initiative. It established a Departmental One Health Steering Committee with a supporting joint working group to coordinate One Health activities implemented by Veterinary Services. The Department of Agriculture also joined with a government-wide One Health Working Group to give and get high-level interagency support. Veterinary Services' One Health activities were later coordinated through the One Health Coordination Office.

Veterinary Services' experience with the One Health initiative has illustrated the need to build partnerships and collaborate with groups within and outside Veterinary Services. It has also learned to promote itself as a valuable One Health resource by sponsoring, attending, and participating in national and international One Health meetings. Through these and other avenues, Veterinary Services has promoted its role, interest, position, and involvement in One Health activities. Veterinary Services has also compiled a portfolio of its One Health activities, plans, and accomplishments. These include promoting and providing training on the One Health concept within Veterinary Services and providing scientific and technical information and support to answer One Health questions from Veterinary Services, the Animal and Plant Health Inspection Service, and US Department of Agriculture leadership.

Veterinary Services' first major One Health activity was to develop an operational plan for its engagement in zoonotic diseases. The plan captures past zoonotic disease endeavours and current zoonotic disease activities, describes Veterinary Services authority and its new One Health direction, and recognizes non-traditional stakeholders for One Health partnerships. The plan recommends a scope of zoonotic disease involvement, phasing in involvement starting with traditional Veterinary Services species and moving to companion animals. It also provides several disease lists to use in considering engagement while recognizing the potential importance of emerging diseases.

With these actions, Veterinary Services has laid the cornerstone of a structure that will coordinate and expand One Health activities within Veterinary Services and facilitate One Health cooperation with other agencies.

Outcomes of the working groups

In the first of the two working group sessions, participants framed their discussion around three topics – zoonotic influenza, rabies, and AMR. The three issues were chosen as 'entry points,' as each is a priority for both human and animal health and each requires cross-sectoral collaboration for effective control. They are each very different: AMR has food safety and clinical implications with remaining scientific questions; rabies has a large domestic animal as well as wildlife component, with few scientific unknowns and accepted multisectoral interventions; and influenza can be associated with huge economic losses in the livestock sector, is a high-profile human pandemic threat, and is an inherently unpredictable pathogen, carrying huge unknown risks. As a result, each can be used to discuss different aspects of cross-sectoral collaboration. The three topics were then divided across six working groups:

- zoonotic influenza in at-risk countries (sporadic outbreaks);
- zoonotic influenza in entrenched/endemic countries;
- rabies transmitted through dogs;
- rabies transmitted through bats and other wildlife;
- antimicrobial resistance in animals and humans in countries with regulatory systems in place in both human health and animal health sectors;
- antimicrobial resistance in animals and humans in countries with no regulatory system in place or a system established in only one sector.

During this session, each of the six groups discussed their designated topic, while at the same time considering applications to a wider selection of issues at the interface. Each group was requested to identify the importance of cross-sectoral approaches to the specific topic, components of a successful cross-sectoral approach at the national/regional level, gaps or infrastructural constraints to success, and mechanisms required for successful implementation. Each group was also asked to identify priority actions for their topic and the national/regional and global mechanisms and infrastructures required to implement successful cross-sectoral approaches.

The second working group session refocused the discussion. Participants in this session were divided into groups addressing either risk assessment or risk management. Posed

with a similar set of questions as during the first working group session, these groups discussed the commonalities and differences in risk assessment and risk management across the three entry point topics, and the broader concept of cross-sectoral collaboration in general.

After discussion, the working groups prepared answers to a series of structured questions and each presented their consensus to the meeting as a whole. Summaries of these outputs from the working groups for each of the three entry point topics and discussions on risk assessment and risk mitigation are presented in the following sections.

Zoonotic influenza

Influenza viruses circulating in animals cause significant social and economic impacts and pose both pandemic and direct threats to human health. Increasingly, the movement of influenza viruses across animal and human populations is being recognized. Because of the inherent unpredictability of influenza viruses, the associated risks to both animal and public health are unknowable, and therefore a public health risk is assumed to exist whenever influenza viruses are circulating in certain animal populations, especially those in direct contact with humans. To reduce risks to health and minimize economic losses, the disease must be controlled at source, in the animal populations where influenza viruses are circulating. At the same time, understanding and addressing human exposure risks at the human–animal interface – especially in poultry-keeping households – is crucial to reduce human morbidity and mortality, requiring an understanding of cultural, social, and economic aspects of risk perception and effective risk communication.

Zoonotic influenza was discussed in two working groups, one focused on countries experiencing sporadic outbreaks and in those at risk, and one on endemic countries. Influenza-specific discussions related most strongly to avian influenza H5N1 in animals and people, likely because participants in these working groups tended to have more experience with this subtype. However, the applicability of similar cross-sectoral principles to assess and manage health threats associated with other zoonotic influenza viruses – such as influenza viruses circulating in swine – was frequently reiterated.

Participants agreed that prevention and control of zoonotic influenza, such as avian influenza H5N1, is complex, especially in countries where viruses are circulating endemically in animal populations. Cross-sectoral collaboration – including animal health and public health as well as academia, private agencies, and non-governmental organizations (NGOs), and those working on environmental, economic, and societal issues – was discussed as being more efficient and effective for control.

It was noted that different sectors have different experiences and perspectives and access to different information required for tackling and finding innovative and appropriate solutions to these complex problems, such as how to balance ensuring adequate protein and income for families with the desire to decrease human exposure to potentially infected household poultry in H5 endemic countries. It was agreed that only by taking into account the entire system in each country, including infrastructural constraints (such as the lack of adequate water for cleaning), governmental/economic priorities (such as funding rational compensation schemes for culled poultry), and the day to day needs of families and village systems, can risk mitigation measures be sustainable.

That the assessment of the health risks associated with zoonotic influenza also benefits from cross-sectoral collaboration was discussed. Participants agreed that input from – at minimum – the animal and public health sectors responsible for virological and epidemiological aspects of zoonotic influenza can allow more complete understanding of the national situation and provide a baseline for assessment of new events or the impact of measures put in place. It was emphasized that further broadening of the involved sectors allows even more comprehensive impact and consequence assessments, including the socioeconomic impacts of culling and other risk mitigation measures.

As well, because zoonotic influenza is generally politically sensitive in affected countries and is also a disease for which there are many unknowns, participants noted that having a cross-sectoral team of knowledgeable people as a resource for decision-makers is more likely to yield well thought out, science based, and appropriate decisions. If this team is also the one tasked with assessing the specific risks and providing integrated or aligned recommendations for balanced and practicable mitigations, then decisions can be made even more relevant and effective. Participants described some heavily affected countries that have convened such standing high-level governmental expert groups to be responsible for national zoonotic influenza issues with varying degrees of success, mostly depending on the level of political will in the country.

Control at source is the agreed approach to most effectively decrease public health risk from zoonotic influenza, especially for sporadically affected countries. However, participants stressed that 'control at source' also requires the engagement of a variety of sectors, including extension services, to be implemented effectively. The public health sector, as well as others involved in health promotion and communications, must support reporting and measures at the household/village level that will be implemented within control programmes.

It was agreed that resource allocation is crucial. Infrastructure, personnel, and funds must be available to provide incentives for reporting outbreaks in poultry and implementing

and complying with control measures. It was noted that even adequate resources would be most effectively used when coordinated through common strategies and national or regional action plans. For sporadic situations, having resources allocated in advance for immediate release for timely reaction can make the difference between effective control in one or a few poultry operations or villages or a situation of onward disease spread and increased public health risk.

With increased collaboration and alignment, participants emphasized that communication among all players becomes even more essential. The various forms of communication were mentioned, including communication to at-risk groups (e.g. household poultry keepers, live animal market workers), producers, veterinarians, the medical community, village leaders, the public, staff in responsible offices, and the scientific and international community. It was mentioned that communication to successive administrative levels in government was crucial, so that the decision-makers understand the importance of these issues in a balanced way, with all impacts included, and so can allocate resources and priority appropriately. The developing global trend of 'influenza fatigue' was noted as a risk to future control programmes and funding for all sectors. It was agreed that the continued risks must be strongly but appropriately communicated in an aligned way among sectors to convey the need for continued vigilance without contributing to 'up and down' messaging regarding the risks from zoonotic influenza.

Because the topic of avian and zoonotic influenza has been a strong focus of cross-sectoral and collaborative work over recent years, these working group discussions did not concentrate on identifying concrete next steps and timelines. Instead, participants identified best practices in endemic and at-risk countries, how effective actions can be maintained, and constraints and gaps.

Rabies

Rabies is a widespread, neglected zoonosis with an almost 100% case fatality rate in both humans and animals and causes a significant social and economic burden in many countries worldwide. Rabies is a highly under-reported disease and human deaths still occur, mainly in Africa and Asia. Worldwide some 14 million people receive post-exposure prophylaxis. The control and elimination of rabies in dogs through vaccination combined with dog population management remains the most cost-effective intervention to protect humans from contracting the disease.

Two working groups addressed rabies, one of the groups dealing with rabies transmitted by dogs and the other with rabies transmitted by wildlife including bats. There was general

agreement that complex problems generally require complex solutions: this is especially true for rabies, as the disease affects a broad spectrum of species ranging from companion animals to livestock and working animals, and wildlife as well as humans, and has very different epidemiological transmission patterns, occurring in diverse socioeconomic and cultural realities. Clear and coordinated international and regional rabies control strategies are required, and the international organizations were asked to engage in advocacy and provide guidance on best practices for the operationalization/implementation of cost-effective rabies prevention and control activities. South–south cooperation could enhance the sharing of successful experiences across regions and continents.

The working groups identified the importance of clear political will, good governance, and enforcement of legislation for rabies control activities to be effective, including the need for functional coordination mechanisms at country level with adequate capacities and resources. For the development of coordinated and successful rabies control programmes, national rabies committees need to be established, integrating different ministries as well as linking government with academia, private sector, NGOs, and communities. While most research is conducted in academia, linking with national and local governments would better address the needs in the field and disseminate wider locally generated information and insights.

Both working groups recognized the importance of public health and animal health policies for rabies prevention and control becoming aligned and successful examples/ lessons learned being more widely shared. The overall under-reporting of rabies cases in all species calls for the urgent strengthening of surveillance and laboratory capacities. Accurate and timely shared epidemiological data, as well as cross-sectoral joint risk assessments, are crucial to enable authorities to assess the impact of rabies for different populations, better elucidate the contextualization of reported cases of rabies, and engage in disease forecasting. This includes the investigation of animal-bite cases as well as obtaining a better understanding of the habitats of rabies-infected bat populations. The requirement for payment for samples submitted for rabies diagnosis in livestock was, however, recognized as a cause for the under-reporting of rabies in production animals.

The groups agreed on the importance of strengthening diverse rabies networks and establishing indicators to measure the progress and success of control activities. Although dog-mediated human rabies is envisioned for elimination, the realities for especially bat-transmitted rabies are more complex and will not be achieved within a short time frame. Recognizing the impact of rabies on human health and livelihoods and considering its prevention and control as a public good will require the allocation of public resources and a dialogue with the private sector, especially where vaccination contributes to the income of private veterinary practitioners.

The group dealing with dog rabies concluded that there is no standard rabies control strategy as the wide variety of cultural differences, especially with regards to dog ownership practices and animal welfare perceptions, requires the tailoring of control strategies to the local context. The availability and accessibility of safe and efficacious rabies vaccines for animals, including that through regional vaccine banks as well as for pre- and post-exposure prophylaxis for humans, should become part of any comprehensive rabies control package. It was further concluded that communities remain key in rabies control activities, and public awareness and education are essential components. Furthermore, the community needs to know what to do when exposed to rabid animals, as well as take up responsible dog ownership and comply with dog vaccination programmes. Besides cross-sectoral collaboration, rabies control also requires transboundary technical cooperation to exchange information on wildlife/bat populations and enforce quarantines and cross-border movement controls.

Collaboration among individuals from different institutions and sectors was identified as an important basis for more sustainable mechanisms of cooperation among institutions. Joint training for veterinary and medical personnel, as implemented through the Field Epidemiology and Laboratory Training Program or other programmes, provides new opportunities for enhanced communication and cooperation between the human and animal health sectors and countries. Both groups felt that there was a need to focus more on technical realities and less on political sensitivities. They called for global/regional trust funds and vaccine banks to be established or expanded to ensure the availability of safe and effective animal rabies vaccines and human post-exposure prophylaxis and sera. Integrating rabies prevention and control with other disease control activities should be further explored, as well as the use of existing mechanisms (e.g., the FAO–OIE Global Framework for the Progressive Control of Transboundary Animal Diseases) and networks of Collaborating and Reference Centres for Rabies Control.

A further interesting outcome of the rabies group discussions was the recommendation to explore the adaptation of the progressive control pathway developed for foot and mouth disease for rabies as this could provide a viable framework for countries to engage in a step-wise approach to eliminate dog-mediated human rabies in the foreseeable future.

Antimicrobial resistance

The discovery of antibiotics to treat bacterial infections and to combat infectious diseases in humans and animals was one of the most important achievements of the 20th century. Since antimicrobials were first mass produced, initially in human medicine and subsequently in veterinary medicine, their use has been associated with the risk of emergence of AMR.

At the same time as the world has observed the accelerated emergence of resistance, the discovery and development of new antimicrobial drugs has slowed, to the extent that the development of AMR is now exceeding the availability of new antimicrobial agents, making AMR a global threat to health. Antimicrobial resistance challenges the effective control of infectious diseases and jeopardizes progress on health outcomes

There has been much debate about the origins of AMR. Nevertheless, linkages between misuse and increasing antimicrobial resistance AMR are of concern. In high-selection-pressure ecosystems, some AMR will always occur. Use, particularly inappropriate use, in both humans and animals can greatly accelerate the development of resistance to these agents in pathogens. Elimination of the inappropriate use of antimicrobial agents is necessary to limit the emergence of new AMR patterns, and addressing AMR will require the combined and coordinated efforts of the human and animal health sectors to keep antimicrobials effective and useful in combatting disease. Human and animal health sectors working together nationally and globally to align policies, strategies, and activities, in collaboration with other stakeholders in the private and public sectors, can reduce the emergence and spread of AMR.

Antimicrobial resistance in animals and humans was addressed in two working groups, one focused on the experiences of countries with regulatory systems in place in both human and animal health sectors, and the other on the experiences of countries with no regulatory systems in place or where a system was established in only one sector. Participants of both groups, each comprising representatives of the different sectors, agreed that AMR was important and that cross-sectoral approaches were necessary to effectively combat the further emergence and spread of AMR. The nature of the conversation varied between the groups. Where regulatory systems were in place, the conversations were focused more on how to improve the relationship between the systems for AMR prevention and control in countries; where systems were not fully present, the focus was on how to implement such systems, including cross-sectoral components.

After setting aside the differences in the nature of the discussions in the two working groups, the challenges and high-priority actions identified in both groups were very similar. For both, obtaining and retaining political and financial support for these systems – again including the cross-sectoral components – was paramount. Across the two groups, the need for regulatory authority within the sectors was recognized, combined with the ability to enforce regulations and the accountability of each sector to all other sectors, including the general public. Participants also recognized the value of having a formal cross-sectoral coordination process, such as an official national cross-sectoral committee on AMR, institutionalized within the government structures and empowered for decision-making. In establishing the collaborative aspects, participants recognized that success

was dependent on involving all relevant stakeholders and that to advance collaboration varied sectors must work from shared ground with common objectives.

Veterinarians and physicians must have science-based guidelines on prudent use, and in the professional circles there remains a need for appropriate training addressing prudent use, both at university and in continuing professional development. This professional education must be complemented by education for patients and farmers to address demand, with the engagement of drug companies. When such education is in place, it should include components to increase understanding of the needs of the different sectors.

Effective surveillance systems are often lacking in one or both sectors, along with the laboratory capacity to support the systems. Policy-makers may still need to be convinced of the importance of AMR, yet there is a lack of adequate data to convince ministers and other policy-makers to fund the development, maintenance, or expansion of the systems. Where surveillance systems exist, successful systems should have mechanisms in place to share information across sectors.

Finally, although the perspective was on actions at national level, it was recognized that what happens in one country affects all countries and that, when developing or expanding AMR programmes, countries should seek to achieve global harmonization and base decisions on the international standards and recommendations from WHO, OIE, and Codex Alimentarius.

The groups outlined concrete activities to implement cross-sectoral approaches to containing AMR. Within the short term (less than six months), increased education on prudent use should be implemented by incorporation into educational and training streams (both formal education and continuing professional development) and through outreach to the general public via mass media. Efforts would be further supported through mandated collaboration among responsible authorities on AMR, for example establishing a signed agreement between agencies and an oversight mechanism. Over a slightly longer time frame, for example 6–12 months, countries should improve and coordinate data collection on resistance through both research and surveillance; this could be at least partially achieved in the short term through accessing already available data, e.g. that collected for clinical purposes, on-farm data, or from other sources. Countries can also make more rapid progress by taking into account the application of international standards for AMR rather than starting from scratch – assessing the applicability of these standards to the national context and disseminating them to relevant bodies, especially medical and veterinary associations. In the longer term (one to two years or longer), countries can take more substantial steps, for example establishing a formal national, cross-sectoral

coordinating committee for AMR, both coordinating research and compiling conclusions to develop and improve policies – including establishing regulatory authority for human and veterinary medicines – and seeking stable commitments to funding.

Risk assessment and risk mitigation

Two working groups addressed the commonalities and differences in risk assessment, and two groups addressed risk mitigation across the three entry point topics. It was interesting to note that the four working groups arrived separately at very similar sets of key elements and constraints for successful collaboration among sectors. Because of this substantial commonality, the outcomes from the risk assessment and risk mitigation discussions are primarily presented as the final key elements for cross-sectoral collaboration.

In these working group sessions specific note was taken of the need to do both risk assessment and the varied aspects of response, including surveillance, using cross-sectoral approaches. The importance of having mechanisms for joint risk assessment – requiring the aligning and sharing of relevant data and harmonization of risk assessment methodologies – was stressed. The HAIRS initiative, presented in plenary and described in Box 3, page 9, was cited as a good example of how this might be done sustainably in countries, providing information to decision-makers and others who need it. Similarly for risk mitigation, the groups noted the importance, for each sector and jointly, of preparedness and planning, clear terms of reference for tasks, and for contingency plans to be elaborated and documented between crises. In addition, operationalizing mechanisms for cross-sectoral responses should include clarification of the roles and responsibilities of each of the sectors. Both joint risk assessment and mitigation are captured within the key operational elements, described further below.

These second working group sessions and the subsequent plenary and panel discussions allowed the crystallization of two final lists of key elements of effective cross-sectoral collaboration to address health risks at the human–animal–ecosystem interface. Key elements fell into two categories: key supporting elements and key operational elements, described below and in Annex 5.

KEY ELEMENTS OF EFFECTIVE CROSS-SECTORAL COLLABORATION

Key supporting elements

Technical and policy issues, constraints, barriers, and solutions mentioned early in the HLTM discussions, starting with the first introduction given by the Undersecretary of Prevention and Health Promotion of the Ministry of Health, were consistently reiterated throughout the meeting. They were reflected during plenary discussions, working groups on the three entry point topics, and discussions of risk assessment and risk mitigation.

The first major outcome of the HLTM was, therefore, the identification by the meeting participants of these key elements supporting effective cross-sectoral efforts. These are the elements that need to be in place to allow and facilitate effective cross-sectoral collaboration.

These elements are inherently and inextricably interconnected and interdependent. The key elements overlap and impact many of the other elements. The existence of one element often directly influences the ability to implement another. These elements are applicable within and among all sectors undertaking cross-sectoral work, irrespective of administrative. The list of key supporting elements is presented in Annex 5 and described in more detail below.

1. Political will and high-level commitment

The existence of sufficient political will is a basic ingredient for successful cross-sectoral collaboration. The will to engage in cross-sectoral approaches must be present from management at every administrative level, from the highest levels of government, including the ministries responsible for human and animal health, to the technical units. This high-level will is required to mandate collaboration, to develop the frameworks and mechanisms necessary to allow cooperation, and to approve the appropriate distribution of resources, including human resources. Such high-level commitment is also required to encourage the cultural and behavioural changes that might be necessary within institutions, particularly those to foster a culture of transparency and trust when working with partners.

To gain political will and commitment from all levels, individuals must be convinced that cross-sectoral approaches work better than conventional vertical approaches. A clear demonstration that cross-sectoral collaboration for addressing health risks at the human–animal–ecosystem interface is more efficacious and/or cost-effective, i.e. a 'proof of concept,' is required. Benefits of the concept can be demonstrated through case studies and operational research but require the establishment of clear performance indicators and cost-effectiveness analyses.

Further, successful implementation of such approaches in selected countries would provide a model for implementation by other countries. Once the evidence is available, mechanisms for direct advocacy to the administrators must be sought. Once political will is established at the highest levels, it is likely to cascade down through the existing supervisory structures.

2. Trust

Trust among partners and among institutions is an essential ingredient for effective cross-sectoral collaboration. None of the other cross-sectoral elements is possible or sustainable unless individuals in the different sectors trust each other. Transparency and communication are essential components of trust. Trust is difficult to establish and easy to destroy. Once destroyed, negative feedback loops are initiated that make trust even harder to re-establish. It should be recognized that conflicts may arise and trust may appear to be breached, particularly when people feel that their traditionally held technical or policy territories are threatened by collaborative approaches.

Proactive and open communication inspires trust, which facilitates further transparency, thus creating a positive feedback loop. Positive loops may be initiated among a few partners who already trust each other, and then cautiously expanded and continuously nurtured and fed. In many cases, cultural and behavioural changes in the way institutions relate to each other must occur before trust between individuals can become truly established. Proactive open discussion can forestall apparent breaches of trust before the trust is broken. Partners and institutions must also have technical confidence in each other's capabilities, and be seen as taking responsibility for their actions. Therefore, all players must prioritize being accountable and credible, as well as trustworthy.

3. Common objectives and priorities

Collaborations are more likely to be successful and sustainable when common objectives are identified. At the same time, differences in relative priority for a certain activity or health issue among collaborating sectors may result in differing approaches to resource management and engagement in the activity.

To ensure adequate engagement of all partners, shared ground must be actively sought early in the planning of activities. In many cases, objectives might have to be added to an activity to engage effectively the appropriate constellation of players. A complementary approach to ensuring collaboration is to foster an institutional, overarching commitment to collaboration that goes beyond individual topics. In this way, even when imbalances in

objectives or priorities exist in a given effort, cross-sectoral work can continue. However, some equity must be envisioned over time for players to continue to engage.

4. Shared benefits

In order for partners to engage in an activity, they must be convinced that they would benefit, directly or indirectly. The benefits of cross-sectoral collaborative activities are not always obvious for each sector, especially during the relationship-building and planning phases; there may be extra work necessary to engage partners, and the outcomes may seem to benefit some partners more than others. As experience with cross-sectoral work grows, the added benefits to each sector become clearer.

Shared benefits of an activity – to individuals and to institutions – must be identified and clearly communicated, as with identification of the common objectives and priorities identified in point 3, above. In order to get engagement from all stakeholders in the activity – including producers and the public – each must be convinced of the benefit to themselves and their agency or interest group. If benefits are not evident for any partner, solutions must be found to provide them, even though in some cases the benefits to some partners may be delayed or may not be easily measurable (such as with prevention programmes).

5. Strong governance structures, aligned legal frameworks, and recognition of existing international standards

The different sectors responsible for human, animal, or ecosystem health generally have different mandates and often function under different sets of international standards and legal frameworks, at international and national level. Effective cross-sectoral collaboration is supported by good governance within sectors and an understanding of the potential constraints, overlaps, and/or gaps in the mandates and legal frameworks across the sectors.

Reviewing the existing national legal structures of the relevant sectors, and the international standards with which these sectors must comply, can identify areas of divergence or conflict as well as areas of shared interests. This process can identify where new legal procedures and memoranda of understanding could be elaborated between sectors to allow engagement in more coordinated and effective disease prevention and control. Activities at the national level, including enacting legislation to facilitate cross-sectoral collaboration, should be based on the governance and standards issued from the international organizations (e.g. WHO International Health Regulations (IHR) and OIE and Codex international standards); this effort would be best supported by further harmonization of these international standards.

6. Adequate and equitably distributed resources

The finite nature of resources requires both a careful evaluation of the existing resources and identification of options for prioritization and allocation of these resources. In some countries a political decision is required on the allocation of budgets linked to health priorities. For cross-sectoral projects, the distribution of resources may be harder to justify and implement than for allocation within a sector and require more complex decisions coordinated among agencies, necessitating sufficient political will and an understanding of the shared benefits. In many cases, animal health sector risk management directly contributes to public health outcomes, for example in the concept of controlling threats to human health at the animal source.

To ensure equity, the appropriate balance of cost attribution to the priorities among sectors should be considered. Finance options for countries in need must be developed in consideration of national priorities, and solutions found to provide funding to countries to both strengthen sectoral systems and facilitate implementation of cross-sectoral approaches. Guidance for seeking cross-sectoral funding is needed. Some international funding partners and countries have already started promoting cross-sectoral approaches through funding provided to the Tripartite and for other cross-sectoral projects and programmes.

7. Identification and involvement of all relevant partners

Taking into account the varied aspects of a given health issue at the human–animal–ecosystem interface, the development of a common vision and plan is the crux of One Health and the rationale for implementing cross-sectoral approaches. Identification of all relevant partners at all relevant administrative levels, and their inclusion from planning through implementation, can increase efficiency and sustainability. Partners may more willingly engage and maintain their involvement when they are recognized and included as a partner early in the process. Inclusiveness also requires looking outside the sectors to include non-governmental partners, communities, and the public, who might be called upon to contribute information or resources. The private sector has an important role to play in the application of cross-sectoral approaches, including in policy development and response.

All possible partners and stakeholders should be identified during the initial conception of projects and activities, although initially it may be challenging to think broadly enough to capture all the appropriate aspects and potential partners. The flexibility to adapt processes and activities to take into account additional partners is also necessary. Invited stakeholders who see limited value in providing input may voluntarily withdraw from the

process. In some cases, private sector initiatives are more advanced than public sector initiatives and can be used as models or frameworks. The establishment of public–private partnerships would actively engage the private sector in this process.

8. Coordinated planning of activities

Efficiency and sustainability need to be addressed early in the planning of all collaborative activities, from time-limited projects to permanent national cross-sectoral programmes and systems. Coordinated planning ensures that many of these key supporting elements can be simultaneously addressed, i.e. objectives, benefits, and resource allocation can be clearly identified for all relevant partners, as described above. Joint planning also harnesses and capitalizes on the experience and expertise of each of the partners involved, resulting in the development of more accurate and feasible estimates of resource requirements, timelines, and budgets. Sustainability is also increased as partners are more likely to become and remain engaged if they see their priorities addressed from the start, rather than after objectives, resources, activities, and benefits have been decided and distributed.

Planning should start with the identification of relevant partners by the lead institution and continue with all contributing their part in developing objectives and activities to address the problem, defining tasks to be accomplished, identifying the partner(s) most appropriate (based on expertise or infrastructure) to address each task, defining clear roles and responsibilities, timelines, and milestones, and allocating funds based on each designated role. In cases in which conflicts arise regarding areas of responsibility, solutions must be found early. Open discussion and clarification of specific roles can lead to identification of areas of overlap and building on complementarity or to finding a mechanism for sharing responsibilities for a specific task.

9. Guidance on implementation of cross-sectoral collaborations

One constraint to the broad, consistent implementation of effective cross-sectoral approaches is a lack of guidance and tools for development and implementation. Guidance on best practices for both policy and technical aspects of cross-sectoral collaboration would provide standard, agreed elements for discussion, alignment, prioritization, and implementation by national ministries and other entities considering taking cross-sectoral approaches. As experience with implementation of cross-sectoral approaches grows, it will become easier to develop tools and guidance, as well as to define what areas would benefit from such tools.

To avoid disparate sets of guidance, consortia of partners should contribute to developing guidance for each aspect of cross-sectoral collaboration. For example, a description of the core competencies important for individuals working cross-sectorally is currently being developed through academic and other institutions, including the Tripartite. Similarly, these key supporting and operational elements themselves will be developed into guidance to assist countries in the initial implementation of cross-sectoral approaches.

10. Capacity development

Capacity development to improve the implementation of cross-sectoral collaboration is necessary, including training that promotes the benefits of working together cross-sectorally, combined with providing tools to allow joint work. Training and other capacity development should be conducted in a cross-sectoral manner, including jointly identifying and solving problems, to allow understanding of each other's perspectives and to demonstrate immediately the benefits of working cross-sectorally.

Outcomes of reviews of existing national legal frameworks' compliance with the WHO IHR, the OIE *Animal Health Codes* and *Manuals*, and the Codex Alimentarius standards and guidelines can provide valuable information on the capacity development within a country and the priority areas for education and human resource development. Capacity development can be done through various mechanisms and national agencies and in collaboration with local NGOs and international partners. Identification of overlapping gaps and joint priorities is a first step to optimal provision of cross-sectoral aspects to training and capacity development.

11. Strong and effective health systems within the individual sectors

Notwithstanding the importance of establishing and ensuring collaborative aspects of national health systems, the strength and quality of the individual sector national health systems is recognized as crucial to being able to contribute to cross-sectoral approaches. Without the capacity to prevent, detect, identify, and respond effectively to threats within each individual sector, national systems will not have the capacity to address health threats at the animal–human–ecosystem interface.

Evaluations and capacity development within individual sectors must continue in parallel with building cross-sectoral tools and mechanisms. The development and implementation of programmes at the country level should be based on the results of assessments undertaken as part of established processes, such as the OIE Performance of Veterinary

Services (PVS) Pathway and the WHO IHR implementation framework assessments, to ensure sustainability over the medium to long term. Optimally, ongoing cross-sectoral communication will allow systems to be built, developed, and implemented that are increasingly aligned among the sectors.

Key operational elements

Throughout the meeting, the HLTM participants also identified key operational elements of effective cross-sectoral efforts. These are the activities that, when in place or undertaken, particularly at the national level, most commonly characterize successful efforts, once the key supporting elements are in place to allow and facilitate effective cross-sectoral collaboration overall.

A. Joint cross-sectoral coordination mechanisms

A. Establishing inter-ministerial committees and local task forces that include representation from the different sectors and conducting regular meetings with agreed objectives and a standard outcome fosters cross-sectoral coordination and builds functional relationships across sectors. Conferring decision-making authority and/or specific advisory capacity on these committees encourages involvement and consensus-seeking.

B. Routine communication

Establishing routine communication mechanisms builds understanding and trust and allows aligned messages to be developed for diverse audiences. The communication mechanisms can include policy and technical communication within and among individuals of agencies or sectors, messages from leadership advocating for changes in culture or practice, outreach and education to policy-makers and the public, and media communications, among many other aspects.

C. Joint simulation exercises

Engaging people in joint simulation exercises that address emergency preparedness, coordination, and communication, among other topics relevant to effective disease response, is a method of fostering cross-sectoral understanding and lead to achieving mutually desired outcomes in practical applications, especially during crisis situations.

Developing joint contingency plans and event coordination mechanisms that take into consideration the practices and procedures of all the relevant partners and sectors can strengthen cross-sectoral coordination.

D. Data sharing

Implementing routine sharing of data and information among sectors, based on an understanding of the benefits of sharing and built upon defined needs and clear procedures for the use of these data, is fundamental to effective cross-sectoral collaboration. The ability to share data and information is dependent on the collection of compatible data and the alignment of surveillance systems, particularly when data are shared routinely among specific sets of partners.

E. Joint risk assessment

Assessing health risks at the human–animal–ecosystem interface – whether for the introduction of a hazard into a new area, the potential exposure of humans or animals, or the resulting health or economic consequences – is most robust when information from all affected sectors and other relevant sources is incorporated and expert representatives from those same sectors participate in the assessment. Risk assessment – ranging from rapid and informal assessments to inform urgent responses through more formal analyses to inform programme development or risk mitigation/management – then serves as the basis for appropriate and coordinated planning for and response to events and issues that affect multiple sectors.

F. Active cooperation on disease control programmes

Developing disease control programmes by examining the multiple steps and sectors involved in detecting, reporting, and responding to zoonotic disease events (including outbreaks), determining where cross-sectoral collaboration is beneficial, and conducting integrated surveillance when necessary leads to more robust systems and more effective prevention and control of diseases at the interface. In the most effective systems, this cooperation extends to harmonizing diagnostic testing and considering joint event investigation and coordinated responses, particularly when humans and animals are simultaneously affected.

WHAT'S NEXT? A STRATEGIC VISION FOR POST-HLTM ACTIONS

The HLTM was partly envisioned to provide a technical basis for a joint ministerial conference described in the Tripartite Concept Note, but there was overall agreement that certain interim activities would need to take place before such an inter-ministerial meeting would be most useful. Additional global movement, including building clearer understanding of the issues at all administrative levels and among a wider scope of partners, as well as a greater breadth of implementation of the principles and actions globally, will drive the pace of planning for a future inter-ministerial meeting. In the meantime, in the aftermath of the HLTM, the Tripartite committed to collaboration with partners around the world to initiate a 'joint ministerial process' to bring the outcomes and messages to a wider audience, gain acceptance, and implement projects. It was noted that ways forward could focus both on the specific entry point topics discussed in the meeting (zoonotic influenza, rabies, and AMR) as well as the key supporting and operational elements identified.

Immediately after the HLTM, staff from the FAO, OIE, WHO and UNSIC brainstormed with the HLTM Steering Committee on immediate ways forward and next steps toward producing deliverable outcomes based on the outputs and perceptions presented at the meeting. Participants discussed how they would be integrating the outcomes of the HLTM into their ongoing cross-sectoral work and priorities. It became clear that the technical and policy-relevant outcomes of the HLTM, combined with momentum built from previous work globally, and the motivation of the Tripartite and others to move this agenda forward, will facilitate additional movement locally, nationally, regionally, and internationally toward more universal acceptance and practical implementation of cross-sectoral approaches.

Below are presented some of the potential priorities, approaches, and next steps identified by the Tripartite and the HLTM Steering Committee members during this discussion, which fell under three interconnected headings:

1. Develop and deliver clear messages

During the HLTM it emerged that exactly what the global community hopes to achieve by taking cross-sectoral approaches to collaborative work at the human–animal– ecosystem interface was at times unclear, even among some of the meeting participants.

Therefore, as a first step, it was agreed that the outcomes of the HLTM – such as the key elements – needed to be translated into clear ministerial-level technical and policy messages and practical national- and regional-level actions in order to be useful. Such

messages of cross-sectoral collaboration as 'standard practice' could be incorporated into a simple guidance document for distribution by the members of the Tripartite to their ministerial partners in regions and countries, with the hope of not only engendering engagement but also of offering a practical tool for ministerial use. How these would be implemented in each country would likely be different, but having such tools would provide standard, agreed elements for inter-ministerial consideration, which could then be prioritized and implemented by the national ministries.

For the Tripartite, offering clear messages would also mean developing a clear Tripartite policy message based on the outcomes of the HLTM and consistent with the vision, mandates, and priorities of the three organizations and within the global context. This policy message would be one step toward addressing the need, identified during the HLTM, for a cultural and behavioural shift toward more cross-sectoral collaboration. An aligned international communication framework to promote such a shift could be the responsibility of the Tripartite in collaboration with its global partners. For Tripartite messages, directly engaging the FAO, OIE, and WHO governing bodies to convey messages and seek political support might be the most efficient delivery mechanism. Offering ways to facilitate direct use of these messages and actions by governments and communities might encourage more rapid uptake and implementation.

The practical translation of HLTM outcomes, as well as Tripartite messages and the communication framework, would then need to be delivered to various existing political processes and broader initiatives as well as directly to regions and countries. Other partners, such as the International Partnership on Pandemic Influenza group, will discuss the HLTM findings and implications for ministerial engagement in the context of pandemic preparedness and could use the alignment provided by the HLTM to work toward implementation of their priority activities.

Members of the steering committee emphasized the need to ensure that the base of the One Health paradigm was sufficiently broad to include all relevant stakeholders and participating groups, not only to ensure representativeness but also to distribute aligned messages broadly. In addition, they noted that evidence, including the cost–benefit analysis, must be developed and provided to facilitate the political acceptance of delivered messages.

2. Develop a clear plan for building cross-sectoral approaches into existing standards and tools and investing in existing systems

Identifying practical cross-sectoral actions was a main theme of the HLTM. Further, it was agreed that incorporating cross-sectoral approaches into existing mechanisms and structures was more efficient than creating new ones. Many countries already have tools, mechanisms, and infrastructure, developed in response to avian influenza H5 and other recent events at the human-animal-ecosystem interface, that could be built upon. Plans to apply these approaches – specifically those described in the key operational elements – could be developed at all administrative levels. Outcomes from the HLTM working groups on zoonotic influenza, rabies, AMR, and risk assessment/risk mitigation could also serve as valuable practical input as such plans are being developed.

The Tripartite has been working to operationalize the Tripartite Concept Note principles into a concrete time-specific Tripartite action plan including indicators. Based on the HLTM outcomes, the draft action plan will be modified and further developed to explicitly address the three HLTM entry point issues – zoonotic influenza, rabies, and AMR – and other key technical areas in which collaboration contributes to Tripartite outcomes at the international, regional, and national level, such as:

- identifying incentives for ministerial engagement;
- strengthening national-level governance and public and animal health systems;
- strengthening the FAO–OIE–WHO Global Early Warning System for Major Animal Diseases Including Zoonoses (GLEWS)2 and adding functions to make it more effective;
- ensuring understanding of the engagement of funding partners to encourage financial support to facilitate cross-sectoral initiatives.

The Tripartite and its partners, such as the World Bank, will be discussing how this process could be supported through various operational modalities.

Members of the HLTM Steering Committee noted that developing and linking existing networks will enable integration of vital aspects and themes and collaboration across disciplines, sectors, and communities of practice, and will facilitate the circulation of information, the sharing of resources, and the implementation of cross-sectoral activities. Inclusion of the private sector (including food manufacturers, education entities, NGOs, etc.) and private sector initiatives should be considered.

2 www.glews.net

To strengthen and align governance and associated legal structures in the public health, environment, and veterinary sectors, the Tripartite will continue working together to review gaps and build linkages between the sectors, as well as build capacity to help countries meet their international obligations under WHO IHR and OIE international standards. The outcomes of this work can both allow concrete plans for system strengthening to be developed at the country level and can facilitate advocacy for funding.

3. Define and describe costs and benefits of cross-sectoral approaches

During the HLTM, it was clearly noted that coordinated, cross-sectoral approaches and interventions could offer increased efficiency and effectiveness – and at the same time noted that, while intuitively obvious and backed up with some strong examples, a positive cost–benefit relationship has not been universally recognized. There are involved partners well placed to conduct economic efficiency analyses, particularly the World Bank.

Partners noted the importance of evaluating the economic impact of adopting cross-sectoral approaches to address health issues to ensure that evidence is provided to policy-makers to make appropriate decisions. This would include performing a costing and cost–benefit analysis of One Health and linking this to current efforts, such as the 'proof of concept' Working Group that arose from the 2010 Stone Mountain meeting (Annex 1). The effective leverage of resources, sharing of responsibilities, and evidence for cost-effectiveness needs to be captured in evaluations of collaborative projects/responses and shared. At the same time, financing options need to be identified or developed that will be available to support the implementation of cross-sectoral approaches in countries.

CONCLUSIONS

The main outcomes of the HLTM are strongly consistent with those from previous One Health conversations and continue to contribute to the global understanding of the opportunities and challenges in this arena. The participants of this meeting advanced the conversation by identifying and reaching broad consensus on key elements for effective cross-sectoral collaboration to address health risks at the human–animal–ecosystem interface – both supporting elements that allow implementation of One Health approaches and operational elements that characterize many successful collaborative efforts.

Technical and policy issues, constraints, barriers, and solutions were mentioned early and consistently at the HLTM – first raised in the opening remarks and further developed

throughout the meeting – and were ultimately crystallized into the final list of key supporting and operational elements. These HLTM outcomes come predominantly from the working group discussions, which were especially rich because they were balanced in perspective; each group comprised a mix of conceptual thinkers and those with practical experience in addressing these topics in field situations. As a result, the HLTM key elements represent an interconnected mix of policy and technical aspects, applicable from the field perspective to the international arena, which reflects the diversity of the participants. Furthermore, this mix of technical and policy-level elements highlights the fact that effective cross-sectoral collaboration cannot exist without considering the full range of complementary technical and policy implications.

Individual key supporting and operational elements for successful cross-sectoral collaboration may require action by different audiences and stakeholders, or certain aspects of elements may be implemented differently by different players. There are elements reflecting activities and commitment required from the highest level of government, others are fundamental building blocks that already exist and require continued maintenance and refinement, and others are specific technical areas of work seen as having the highest potential yield for improved collaboration. And some elements – such as building trust – have to be embraced by everyone. It was agreed that, in all instances, existing structures and mechanisms should be used when they exist.

At the highest level, there is a need for political level support and engagement from all sectors. Political will, trust, and, in some instances, financial support are crucial to establishing cross-sectoral approaches in local, national, regional, and international institutions and infrastructure to address health risks at the human–animal–ecosystem interface. This will require engaging in a constructive dialogue with relevant political bodies at all levels to advocate for the benefits of cross-sectoral collaboration.

As captured in the key operational elements, sharing information and strengthening collaboration in assessment, surveillance and reporting among different sectors, including their public and private components, and developing the appropriate sectoral and cross-sectoral capacity are crucial to ensuring early detection and appropriate rapid response to health threats. Strong governance structures and aligned legal frameworks are essential to achieving effective disease surveillance and response. Communication is crucial to ensuring cross-sectoral coordination. Joint training and simulation exercises, and coordinated evaluation and gap analysis of national human and animal health systems are fundamental for cross-sectoral collaboration. Zoonotic influenza, rabies, and AMR, used as entry points for discussion, are models in which the benefits of cross-sectoral approaches are evident. However, as a starting point, national veterinary and public health systems need to be strong and functional; to achieve this globally will require basic and ongoing capacity development.

There was also consensus that scientific and economic underpinnings for cross-sectoral approaches are still needed. A variety of practical examples of successful cross-sectoral collaboration were offered at the HLTM, including those presented in the plenaries, and there was a broadly applicable intuitive feeling that cross-sectoral approaches are optimal for addressing health issues at the animal–human–ecosystem interface. A body of scientific and economic 'evidence' for the efficiency and efficacy of cross-sectoral approaches is still largely lacking, however, yet is almost certainly necessary for ministers of finance, national parliaments, and others to allocate funds for such projects. Accumulation of such evidence, as might be predicted to happen rather rapidly over the next few years, is expected to provide additional momentum to the global application of cross-sectoral approaches. Complementary to a common understanding of the cost-effectiveness of implementing cross-sectoral approaches, the need for early and obvious financial incentives was also recognized – necessitating the identification of resources globally or nationally to jump start the process of working collaboratively in countries.

This meeting emphasized the critical and overarching need to bring these concepts, key elements, and approaches to the ministerial level so that they can begin to be applied where they can have the most impact – in countries. At various points during the meeting, participants requested support from the Tripartite and other partners to do this: to move forward the One Health agenda globally. The Tripartite was requested to disseminate general guidelines for implementation of cross-sectoral approaches at country level and engage in proactive communication with ministers, national policy-makers, various other stakeholders, and other United Nations partners. There was a suggestion that upcoming opportunities where ministers will meet, other high-level international and regional meetings, and the annual meetings of the governing bodies of the Tripartite organizations should be seen as opportunities for advocacy and support-building for cross-sectoral collaboration and the One Health approach.

The Tripartite and its global partners are committed to helping countries to implement cross-sectoral approaches to address their health risks at the human–animal–ecosystem interface. This meeting was an important step in that process. Next steps include building additional understanding of the benefits, as well as tools to support and underpin the political will necessary for the initiation and sustainability of these cross-sectoral approaches.

ANNEXES

ANNEX 1

Selected international One Health-related meetings preceding the HLTM

INTERNATIONAL MINISTERIAL CONFERENCE ON AVIAN AND PANDEMIC INFLUENZA (IMCAPI) MEETINGS

Meeting on Avian Influenza and Human Pandemic Influenza, Geneva, Switzerland, 7-9 November 2005. Available at: www.who.int/mediacentre/events/2005/avian_influenza/summary_report_Nov_2005_meeting.pdf

International Pledging Conference on Avian and Human Pandemic Influenza , Beijing, China, 17-18 January 2006. Available at: siteresources.worldbank.org/PROJECTS/Resources/40940-1136754783560/beijingdeclaration.pdf

International Ministerial Meeting and Donor Conference, Bamako, Mali, 6-8 December 2006. Available at: www.fao.org/docs/eims/upload//218691/declaration_bamako_dec06_en.pdf

International Ministerial Conference on Avian and Pandemic Influenza, New Delhi, India, 4-6 December 2007. Available at: un-influenza.org/files/DelhiVisionRoadmapFinal.pdf

International Ministerial Conference on Avian Influenza, Sharm El Sheikh, Egypt, 24-26 October 2008. Available at: www.undg.org/docs/9517/GoE-final-SeS-statement.pdf

International Ministerial Conference on Animal and Pandemic Influenza: The Way Forward, Hanoi, Vietnam, 19-21 April 2010. Available at: un-influenza.org/node/4040

GLOBAL-LEVEL POLICY MEETINGS

One World, One Health: Building Interdisciplinary Bridges to Health in a 'Globalized World', Manhattan, New York, USA, 29 September 2004. Available at: www.oneworldonehealth.org/sept2004owoh_sept04.html

One World, One Health: From Ideas to Action, Winnipeg, Manitoba, Canada, 16-19 March 2009. Available at: www.phac-aspc.gc.ca/publicat/2009/er-rc/pdf/er-rc-eng.pdf

Shifting from Emergency Response to Prevention of Pandemic Disease Threats at Source, Chatham House, London, UK, 16-17 March 2010. Available at: www.chathamhouse.org/sites/default/files/public/Research/Energy,%20Environment%20and%20Development/0410mtg_report.pdf

Operationalizing 'One Health': A Policy Perspective – Taking Stock and Shaping an Implementation Roadmap, Stone Mountain, Atlanta, GA, USA, 4–6 May, 2010. Available at: www.cdc.gov/onehealth/pdf/atlanta/meeting-overview.pdf

Expert Meeting on One Health Governance and Global Network, Atlanta, GA, USA, 31 October to 1 November 2011. Available at: eeas.europa.eu/health/docs/2011_report-experts-atlanta_en.pdf

TECHNICAL MEETINGS

FAO/OIE/WHO Technical Consultation on the Control of Avian Influenza, Rome, Italy, 3-4 February 2004. Available at: www.oie.int/downld/AVIAN%20INFLUENZA/avian_rome_feb04_report.pdf

Technical Workshop on Highly Pathogenic Avian Influenza and Human H5N1 Infection, Rome, Italy, 27–29 June 2007. Available at: www.fao.org/docs/eims/upload/232772/ah668e.pdf

FAO–OIE–WHO Joint Technical Consultation on Avian Influenza at the Human Animal Interface, Verona, Italy, 7-9 October 2008. Influenza and Other Respiratory Viruses, 2010; 4(S1):1-43. Available at: onlinelibrary.wiley.com/doi/10.1111/irv.2010.4.issue-s1/issuetoc#group3

Second FAO–OIE–WHO Joint Technical Consultation, Verona, Italy, 27-29 April 2010. Available at: www.fao.org/docrep/014/i1963e/i1963e00.pdf

The 1st International One Health Congress, Melbourne, Victoria, Australia, 14-16 February 2011. Available at: www.onehealth2011.com/program.php

ANNEX 2

The FAO-OIE-WHO Collaboration

Sharing responsibilities and coordinating global activities to address health risks at the animal-human-ecosystems interfaces

A Tripartite Concept Note

April 2010

WHO

VISION

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.

BACKGROUND

Pathogens circulating in animal populations can threaten both animal and human health, and thus both the animal and human heath sectors have a stake in, and responsibility for, their control. Pathogens – viruses, bacteria or parasites – have evolved and perfected their life cycles in an environment that is more and more favorable to them and ensures their continuity through time by replicating and moving from diseased host to a susceptible new host.

While the integration of control systems across animal, food and human sectors has been attempted in some countries and regions, most country control systems are generally non-integrated with limited collaborative work.
However, the recent efforts to control highly pathogenic avian influenza (HPAI) and contributions towards pandemic preparedness have re-emphasized the need for enhanced concentration on reducing risks associated with zoonotic pathogens and diseases of animal origin through cross-sectoral collaboration, and have underscored the fact that successful and sustained results are possible when functional collaborations are established as is the case in many countries and internationally.

While FAO, OIE and WHO have long-standing experience in direct collaboration, the tripartite partners realize that managing and responding to risks related to zoonoses and some high impact diseases is complex and requires multi-sectoral and multi-institutional cooperation. This document sets a strategic direction for FAO-OIE-WHO to take together and proposes a long term basis for international collaboration aimed at coordinating global activities to address health risks at the human-animal-ecosystems interfaces.
A complementary agenda and new synergies between FAO, OIE and WHO will include normative work, public communication, pathogen detection, risk assessment and management, technical capacity building and research development.

FAO-OIE-WHO TRIPARTITE STRATEGIC ALIGNMENT

FAO, OIE and WHO recognize that addressing health risks at the human-animal-ecosystems interfaces requires strong partnerships among players who may have different perspectives on some issues and different levels of resources. These partnerships - which could include ones among international organizations, governments, civil society and donors - must be coordinated to minimize the burden on member countries of multiple monitoring, reporting and delivery systems, and to avoid duplicated efforts and fragmented outcomes. A framework for collaboration is necessary at national and international levels, with clear roles and responsibilities.

There is also a need to strengthen animal and human health institutions, as well as partnerships, and to manage existing and novel diseases that will be of public health, agricultural, social and economic importance in the future. When appropriate, protocols and standards for managing emerging zoonotic diseases should be jointly developed. In the cases of high-impact zoonotic diseases, improvements in governance, infrastructure and capacity building will also prove valuable to secure the livelihoods of vulnerable populations.

A joint framework to address gaps and strengthen collaboration in human and animal health laboratory activities should be developed. The framework should cover the upgrading of facilities, training and collaboration between regional and international reference laboratories for diagnosis and quality assurance. The framework should also promote cooperation between human and animal surveillance systems in analysing available evidence and evaluating responses and the timely sharing of comparable epidemiological and pathogen data across the relevant sectors.

The three organizations will work to achieve alignment and coherence of related global standard setting activities (Codex Alimentarius, OIE and IPPC) referred to in the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures. This approach does not signify integrating these institutions or building new institutions; rather, the three agencies should continue to improve communication and coordination based on their respective existing structures and mechanisms, including consideration for the publication of common standards.

The existing Codex Alimentarius (FAO/WHO) framework for risk analysis can form the foundation for sound, scientifically-based risk assessment, management and communication.
Similarly, the OIE has adopted and published global standards for terrestrial and aquatic animals recognized by the WTO. This alliance could lead to the preparation of tripartite protocols for risk assessment, management and communication, including recommendations and guidance for countries on identifying data gaps.

Effective strategies for improving national, regional and community level pandemic preparedness and response should be further developed or refined. This tripartite relationship envisages complementary work to develop normative standards and field programs to achieve One Health goals.

CURRENT FAO-OIE-WHO COLLABORATION

The three organizations recognize a joint responsibility for addressing zoonotic and other high impact diseases and have been working together for several decades to minimize the health, social and economic impact from diseases arising at the human-animal interface by preventing, detecting, controlling, eliminating or managing disease risks to humans originating directly or indirectly from domestic or wild animals. FAO, OIE and WHO have created governance structures, established early warning systems and developed mechanisms to enhance coordination and support member countries.

The three organizations provide a neutral platform for nations to engage in dialogue and negotiations. WHO and FAO have 194 members and decentralized systems that represent their organizations in regional matters and in many cases have an accredited representative before the government. The OIE, with 175 member countries, has regional and sub-regional representation worldwide. The country delegates to the OIE, usually the national Chief Veterinary Officers, are government representatives nominated by ministers.

The three agencies collaborate to advance their own normative and standard scope-setting. For instance, WHO and FAO participate in OIE's *ad hoc* thematic and working group meetings (e.g. OIE Working Group on Animal Production Food Safety). WHO contributes to FAO's work on reducing biological safety risks, and OIE contributes to the Codex Alimentarius Commission (CAC) and its subsidiary bodies' work (Joint FAO/WHO Food Standards Programme) for food, animal and health aspects prior to processing and marketing guidance to norms that assist in food safety and food-borne pathogens.

The FAO-OIE-WHO Global Early Warning and Response System for Major Animal Diseases, including zoonoses, (GLEWS), combines the alert and response mechanisms of the three organizations in order to avoid duplication and coordinate verification processes. FAO also has numerous databases for which integration into GLEWS is required. To support the notification of cases of the main animal diseases, including zoonoses, and the subsequent analyses of these data, the OIE has developed the World Animal Health Information System and Database (WAHIS and WAHID). The official notifications are in the public domain and contribute to GLEWS.

Similarly, WHO and FAO produce INFOSAN, which alerts national focal points on the occurrence of regional or global concerns for a food safety event. The three organizations also participate in the Working Group on Animal Production Food Safety, established by OIE, to develop guidelines to enhance the responsibilities and effectiveness of Veterinary Services in improving food safety at both the international and national levels. FAO and OIE have developed a joint Network of Expertise on Animal Influenza (OFFLU) to support international efforts to monitor and control infections of avian influenza. Links between OFFLU and WHO's Global Influenza Programme are now strong, facilitating a free exchange of information and the establishment of joint technical projects between the two networks.

The organizations recognize the importance of and assist member countries to improve their national legislation by enabling veterinary and public health authorities to carry out key functions, including animal production, food safety, inspection and certification of animal products, importation or internal quality control of pharmaceuticals, as well as compliance with international obligations. Evaluation and gap analysis tools (such as the OIE Pathway for Veterinary Services) are used at the global level and must be further developed.

FAO, OIE and WHO have together developed numerous coordination mechanisms. Annual tripartite meetings are organized alternatively by the three organizations in order to improve coordination. The tripartite organizations also communicate weekly regarding matters of common interest and have liaison officers that function at the global level, which has facilitated the preparation of joint messages and shared publications. Technical experts from the three organizations regularly participate in technical meetings or consultations hosted by partner organizations and, at times, represent the other organizations at high level conferences.

The two principal agencies dealing with animal health issues, the OIE and FAO, launched in 2004 the Global Framework for the Control of Transboundary Animal Diseases (GF-TADs), which provides a clear vision and framework to address endemic and emerging infectious diseases, including zoonoses. WHO is associated with this mechanism through GLEWS, in the case of zoonoses, where information exchange occurs daily.

The three international organizations have an important role in information generation and dissemination, networking and capacity building at various levels. Expert consultations, technical meetings and the elaboration of various documents ranging from guidelines and practical manuals to strategic and policy papers are readily made available to countries. For example, in 2004, a consortium of agencies, including FAO, OIE and WHO, developed the *International Portal on Food Safety, Animal and Plant Health (IPFSAPH)*, an online source to facilitate international trade in food and agricultural products.

At the regional level, FAO and OIE have established the Regional Animal Health Centres (RAHCs) that provide member countries with technical support and evaluate national and regional projects, supported where necessary by FAO and OIE networks of expertise to further advance international standards, provide guidance and promote capacity building. The Animal Health Regional Centres operate directly within the framework of the GF-TADs Agreement. Finally, FAO, OIE and WHO recognize Farmer Field Schools and livestock owners' training as an important tool in the development agenda, which if successful, can fully address problems surrounding zoonosis prevention and hygiene, best agricultural practices, and care and use of natural resources through concepts such as participatory approaches to learning.

JOINT ACTION FOR FUTURE COLLABORATION

Joint efforts should be engaged at regional and national levels to obtain deeper and sustainable political support for integrated prevention of diseases and the effect of high impact pathogens of medical and veterinary importance. There is a need for the joint development of effective interventions to ensure coherence of action and awareness among the general public and policy makers of risks and appropriate actions needed to minimize human infection by pathogens of animal origin.

Models for forecasting animal disease outbreaks should be developed in close collaboration with all relevant sectors and institutions so that animal disease outbreaks which precede human outbreaks can provide an early warning, and ensure preparedness and a targeted response. There is also a need to advocate for increased funding support and explore research partnerships with the private sector. The three agencies should align data collection, risk assessment and risk reduction measures, and focus on the development of outbreak investigation and response strategies which merge animal and human health dynamics into a comprehensive approach for disease detection and control. The development of capacity for joint risk assessment on priority zoonotic and other high impact diseases should be incorporated into coordinated regional action plans.

In order to achieve more effective management of zoonotic and other high impact diseases in the future, there is a global need to improve diagnostics, data analysis and risk assessment, epidemiology, social science and communication.
Linking expert institutions through global networks within both the animal and health sectors would enable new real-time systems where methodology, data availability and responsibilities are shared both horizontally and vertically. Improved networking among countries promotes trust, transparency and cooperation.

THE WAY FORWARD

FAO, OIE and WHO are committed to working more closely together to align activities related to the animal-human-ecosystems interfaces in order to support member countries. The emergence of new or the re-emergence of existing animal diseases, including zoonoses, the growing threat of transboundary animal diseases, the impact of environmental changes and globalization, as well as new societal demands related to food security, food safety, public health and animal welfare, emphasize the critical need for collaboration between the three organizations.

Prevention of the emergence and cross-border spread of human and animal infectious diseases is a global public good with benefits which extend to all countries, people and generations. The tripartite partners encourage international solidarity in the control of human and animal diseases, while providing international support to member countries requesting assistance with human and animal disease control and eradication operations.

The three organizations envisage a coordination mechanism to better consolidate fragmented efforts at global, regional, national and sub-national levels. The establishment of a Ministerial Conference through which different international and country stakeholders voice expectations and determine future activities under a banner of consensus is required. As the principal technical organizations, FAO, OIE and WHO should lead and promote the agenda by organizing a joint Ministerial Conference involving ministers of agriculture and health at the global level to provide a platform to discuss issues related to animal and human health, including zoonoses, and the impact on health and development.

ANNEX 3

Agenda of the High Level Technical Meeting to Address Health Risks at the Human-Animal-Ecosystem Interface

WHO

Agenda of the High-Level Technical Meeting to Address Health Risks at the Human–Animal–Ecosystem Interface

DAY 0: Monday 14 November 2011			Location
Arrival of participants and meeting registration			2nd Floor Sheraton Hotel
DAY 1: Tuesday 15 November 2011			**Location**
08:15-09:00	**Meeting registration**		Foayer de Grupos Torre Danubio, 1st floor
09:00-10:00	**OPENING SESSION (plenary)** **Part 1:** **Welcome Note** **Official Opening speeches**	**Chair:** Mauricio Hernandez Minister of Health of Mexico, Mr Salomón Chertorivski **Mexican representatives:** Mauricio Limon Enrique Sanchez-Cruz Hugo Lopez-Gatell **Tripartite representatives:** Bernard Vallat Keji Fukuda Berhe Tekola Chadia Wannus	Bugambilia Room Main Building, 3rd floor
	Part 2: Objectives of the meeting Presentation on purpose, aim and objectives of meeting and working methodologies	**Tripartite representatives:** Keiji Fukuda Berhe Tekola Bernard Vallat	Bugambilia Room Main Building, 3rd floor
10:00-10:30	**SESSION 1 (plenary)** **Keynote speakers 1** **Topic:** Setting the scene (1): landscape for cross-sectoral collaboration to address health issues at the human-animal-ecosystems	**Chair**: Alain Vandersmissen Keynote Presenter: Carol Rubin	Bugambilia Room Main Building, 3rd floor
10:30-11:00	**Coffee Break**		
11:00-12:00	**SESSION 2 (plenary)** **Keynote speaker 2** **Topic:** Setting the scene (2): practical examples of cross-sectoral collaboration to address human and animal health issues at the human-animal-ecosystem interfaces, including key actions	**Chair:** Francois Le Gall Keynote Presenter 2: Jakob Zinsstag	Bugambilia Room Main Building, 3rd floor
	Discussion		
12:00-12:15	**Introducing the Working Groups' composition and methodology of work**	Juan Lubroth	
12:15-13:30	**Lunch**		

13:30-15:30	**SESSION 3: Working groups** WG A: Zoonotic Influenza in at risk countries WG B: Zoonotic Influenza in entrenched countries WG C: Rabies transmitted through dogs WG D: Rabies transmitted through bats and other wildlife WG E: AMR in animals and humans in country with regulatory systems in place in both human health and animal health sectors WG F: AMR in animals and humans in countries with no regulatory system in place or system established in only one sector	6 Facilitators	**WG A: Constitución** **WG B: Constitución** **WG C: Constitución** **WG D: Imperio** **WG E: Imperio** **WG F: Colonia**
15:30-16:00	**Coffee Break**		
16:30-18:00	**Presentation of working groups and discussion (plenary)**	**Chair:** Bernard Vallat	Constitución Room, Torre Danubio, 2nd floor
19:00-21:00	**Reception Cocktail** **Angel A and B Room**		
DAY 2: Wednesday 16 November 2011			**Location**
09:00-09:15	**Summary of previous day (plenary)**	**Chair:** Maged Younes	Constitución Room, Torre Danubio, 2nd floor
09:15-10:00	**SESSION 4 (plenary)** Presentation 1: Overall aim: to help the participants understand the benefits of national cross sectoral collaboration in assessment of risks at the human-animal -ecosystem interface Discussion	Chair: Maged Younes Presenter: Dilys Morgan	
10:00-10:30	**Presentation 2:** Implementing One Health in the United States Department of Agriculture: moving from forming, storming, and norming to performing **Discussion**	Chair: Maged Younes Presenter: Joseph Annelli	
10:30-11:00	**Coffee Break**		

11:00-12:30	**SESSION 5 (break out rooms)** **4 Working Groups** WG G and WG H to address commonalities and differences in Risk Assessment addressing the three issues (influenza, rabies, and AMR) as well as others, including successes, real-world impediments and practical options for overcoming impediments WG I and WG K: to address commonalities and differences in Risk Mitigation for the three issues (influenza, rabies, and AMR), as well as others including successes, real-world impediments and practical options for overcoming impediments	4 Facilitators:	WG G: Imperio A WG H: Imperio B WG I: Imperio C WG J: Colonia
12:30-13:30	**Lunch**		
13:30-15:30	**Session 5 (continued)**	4 Facilitators	WG G: Imperio A WG H: Imperio B WG I: Imperio C WG J: Colonia
15:30-16:00	**Coffee Break**		
16:30-18:00	**SESSION 6 (plenary)** Presentation of working groups and discussion	Chair: Berhe Tekola	Constitución Room, Torre Danubio, 2nd floor
18:30	Transportation from the Hotel to the National Anthropology Museum		National Anthropology Museum
19:00-20:00	Guided visit to the Museum		
19:00	Dinner at the National Anthropology Museum Patio		
DAY 3: Thursday 17 November 2011			**Location**
09:00-10:30	**SESSION 7 (plenary)** - Summary of Days 1 and 2 and introduction to final day. - Summary of Day 2 discussions and consolidation of key elements of a future policy statement to be developed between now and the Joint Ministerial Meeting (JMM) and brought to Ministers during the JMM. - Presentation of a roadmap to the JMM with milestones. *(15 minutes)* Panel discussion on key elements: refining/ modification/ completion	**Chair:** *Keiji Fukuda* Panel: - Keiji Fukuda (as Tripartite Representative) - Francois Le Gall (WB) - Alain Vandersmissen (EU) - Mauricio Hernandez (Mexico)	Constitución Room, Torre Danubio, 2nd floor
10:30-11:00	**Coffee Break**		

11:00-13:00	**SESSION 7 continued** (plenary) Panel discussion Agreement on components of policy statement and next steps to the JMM (Roadmap)		Constitución Room, Torre Danubio, 2nd floor
13:00-13:15	**SESSION 8** (plenary) Closing remarks	Chair: Hugo Fregoso Mexico representative: Enrique Sánchez Cruz Tripartite representatives	
13:15-14:15	**Press Conference**	Tripartite Spokespersons Mauricio Hernandez Mauricio Limon Enrique Sanchez-Cruz	Imperio A Room Torre Danubio, 2nd floor
13:15-14:15	**Lunch**		
14:15-16:00	**SESSION 9** (plenary) Wrap up and planning session for Secretariat and Steering Committee, including next steps (Roadmap) to JMM	**Chair:** Hugo Lopez-Gatell Mexico representative: Mauricio Hernández Tripartite representatives Members of the Steering Committee	Constitución Room, Torre Danubio, 2nd floor

ANNEX 4

Background papers on zoonotic influenza, antimicrobial resistance and rabies

4-1: Cross-sectoral Management of Public Health Risks from Animal Influenza

4-2: Jointly Addressing Antimicrobial Resistance (AMR) at the Human–Animal–Ecosystems Interface to Preserve Effectiveness of Antimicrobial Agents

4-3: Jointly Addressing Rabies

WHO

ANNEX 4-1: CROSS-SECTORAL MANAGEMENT OF PUBLIC HEALTH RISKS FROM ANIMAL INFLUENZA

CONCEPT STATEMENT

Influenza viruses circulating in animals pose both pandemic and direct threats to human health, in addition to the threats to animal health. The need to address these threats has been a strong catalyst in building cross-sectoral relationships and aligned strategies within the global health community over the past ten years. The public health risk exists whenever influenza viruses are circulating in certain animal populations, especially those in direct contact with humans. Therefore, improved disease management at source is necessary to stop both spill-over of infections from animals to humans and prevent further geographic spread, which means health can be better protected and economic losses kept to a minimum. Zoonotic influenza is perhaps the best example of a disease that has been addressed globally, regionally, nationally and locally in a cross-sectoral way.

BACKGROUND

At the global level, human seasonal influenza viruses continuously circulate in human populations. Animal influenza viruses circulate among bird, pig, horse, dog and sea mammal populations, and may cross the species barrier to infect humans. Swine and avian influenza viruses have been at the origins of previous pandemic human influenza viruses (H1 in 1918 and 2009, H2 in 1957 and H3 in 1968). It is likely that a next human pandemic virus will also have genetic sequences of animal origin. However, because influenza viruses change rapidly and unpredictably, it is challenging to define and identify exactly which viruses pose potential specific risks to public health.

In 1997, a strain of H5N1 avian influenza virus that was highly virulent in poultry was shown to cause fatalities also in humans. In late 2003, this H5N1 strain reported in birds began spreading rapidly from its southeastern Asia setting to over 60 countries by 2006. Hundreds of millions of poultry and wild bird populations died from H5N1 infections or were culled through instituted measures attempting to curb its spread. To date, over 500 people who had contact with infected birds have been infected by the H5N1 strain, with an over 55% case fatality rate. Avian H9 and H7 subtypes have also caused human disease and at least one reported death.

Experience with zoonotic influenza has fundamentally changed the way we think about zoonotic diseases globally. The concept of controlling zoonotic influenza, especially H5N1, at source implies that robust, adequately resourced national veterinary systems that can effectively respond to animal health events before spill-over into human populations are essential for public health. Such robust systems require appropriate legislation, and the strengthening of education, communication and extension services, shared and timely information between a variety of health agencies – whether public or private – and development of tools to detect and respond to disease events in an appropriate manner that protects human health and people's livelihoods.

Veterinary systems also need linkages with human health systems to detect virus circulation and disease, exchange information, and assess and reduce risks at the human-animal-ecosystems interface, at local, national, regional and global levels. The GLEWS platform (an FAO-OIE-WHO initiative) is also an important global-level tool to track non-official information in order to confirm or deny rumors that can also contribute to national and regional level understanding of zoonotic influenza.

Many collaborative initiatives and mechanisms have been developed and implemented to address zoonotic influenza threats.

GLOBAL COLLABORATIVE INITIATIVES

- OIE-FAO joint network of expertise on animal influenza (OFFLU) including the development of OFFLU animal influenza surveillance guidance (in collaboration with WHO) to promote and standardize collection of surveillance information collected on these viruses.

- OFFLU- WHO collaborative framework to align strategies and fill technical gaps between animal health and public health sectors. Through this collaboration, the WHO vaccine strain selection process now has access to crucial information regarding viruses circulating in animal reservoirs for selecting and preparing appropriate inter-pandemic vaccine virus strains.

- Implementation of a 4-way linking framework in selected pilot countries to facilitate collection and linking of epidemiological and virological data from the animal and public health sectors to allow national level integrated assessment of public health risks from H5N1 avian influenza.

- The OFFLU-endorsed genetic module in the FAO animal disease database linking epidemiological data with genetic sequences, allowing phylogenic analysis and visualization of the distribution of virus features.

- FAO, OIE and WHO Global Early Warning and Response System for Major Animal Diseases including Zoonoses (GLEWS) to improve the early warning and response capacity to animal disease threats, including zoonoses.

- IMCAPI process with UNSIC coordination.

- Joint FAO-WHO-led simulation exercises in Eastern Europe and sub-Saharan Africa.

- Intersectoral work outside the tripartite (e.g., FAO-UN Environmental Program/ Convention on Migratory Species co-conveners of Task Force on Avian Influenza in Wild Birds; in collaboration with GLEWS and OIE/WAHIS mechanisms).

- Joint FAO, OIE, and WHO communications (i.e., press releases, manuals, guidelines).

NATIONAL COLLABORATIVE INITIATIVES

In Egypt, a National Supreme Committee for Avian Influenza and two Technical Committees (for animal health and public health) were convened at the highest governmental level to address national animal and zoonotic risks from H5N1 virus. Systems for communicating information between the animal health and public health sectors and sending out joint response teams to investigate new events were initiated in severely affected governorates. Although these mechanisms have had mixed success, great improvement in national understanding of the importance of cross- sectoral collaboration has developed.

In Indonesia, there are ongoing technical linkages and regular communication, including joint work on zoonotic influenza projects, between the WHO and FAO country offices (such as the Live Animal Market project initiated in 2007). Similar communications links have been made between agencies in China and Viet Nam.

In some Indonesian provinces, the staffs from the animal and public health sector also communicate regularly and undertake joint investigations in relation to H5N1 events.

The animal health sector has initiated many successful national and regional programs with participatory approaches to improve the capture of field-level disease information. Some of these also have national-level linkages with public health sector:

- 'CAHO' (community animal health outreach; Egypt)
- 'PDS' (Participatory Disease Search; Indonesia)
- Grassroots communications for animal and public health (Nigeria)
- SMS surveillance gateway (Bangladesh); Pilot pen technologies (East and southern Africa)
- From penside diagnostics up to advanced virus characterization (with private sector, OIE/FAO reference centres, advanced research institutions and academia)
- OIE pilot One Health PVS (Costa Rica, Kenya)

POTENTIAL BENEFITS OF COLLABORATION (ESPECIALLY OF MINISTERIAL-LEVEL ENGAGEMENT)

- Rapid and routine inter/trans-agency information flow, including routine sharing and tracing of key data among administrative levels and among governorates/provinces, as well as among sectors.

- A full understanding of national influenza risks and optimal management and communication strategies, built through integrated risk assessment mechanisms.

- Coordinated sharing of diagnostic results for coordinated surveillance and response.

- Early detection and response to influenza events before spill-over from one epidemiological unit or population to another, using biosecurity and farmers' compensation policies.

- Safer production and marketing practices; improved hygiene from farm, in transport and along the market chain.

- Alignment of messages for improved hygiene in household animal-keeping and food preparation (could be multi-threat approaches).

- Trust and confidence built among the agencies responsible for human, veterinary/ agriculture, and environmental health; as well as potentially between these agencies and animal production systems managers and producers.

- Local multi-sectoral training, so that policies and procedures are aligned and partners build relationships and trust (i.e., CAHWS-CHWs) , including initial and continuing education of physicians, veterinarians, medical/veterinary paraprofessionals, and farmers.

- Inter- disciplinary extension services that include agriculture, animal, environment, and public health.

- Coordinated risk/outbreak communication.

NATIONAL-LEVEL CHALLENGES

- Scope of work is often conducted in isolation from other health disciplines, so that little understanding (or trust) has been built among partners, which is crucial to cross-sectoral collaboration.

- Data may not exist, and animal health and public health data are generally not linked temperospatially. Unlinked data can not be used for assessment of public health risks.

- There is often little incentive to share key information among sectors or among administrative levels of government, nor much understanding of what needs to be shared.

- Diagnostic results (including genetic data) and current information on vaccine efficacy/ relevance are often not shared among agencies in real-time manner and sometimes only after peer-reviewed articles are published.

- There are often technical, infrastructural, political, legal, social and economic barriers to reporting influenza outbreaks in animals and human cases of zoonotic influenza infection.

- The partners and counterparts in the various sectors generally do not know one another. Thus, even if communication is desired, appropriate contact points are unknown.

- Animal health systems are often weak in developing/in-transition countries, and salaries lower compared to other health professions.

- Country responses to a neighbouring country's transparent reporting may negatively affect trade and tourism.

- Addressing animal and public health risks in an appropriate manner (i.e., to reduce market shocks, to correctly communicate relative health threats).

- Poor participation of the commercial sector in applying or complying with disease control measures; inability for subsistence sectors to comply with disease prevention or control measures.

- Disease control strategies are poorly resourced in the veterinary sector, including lack of compensation policies.

- Knowledge on, volume and extent of informal trade.

- Higher costs to producers and consumers as a result of implementing disease prevention and control measures.

POTENTIAL CONCRETE NEXT STEPS FOR ACTION

- Continue ongoing implementation of WHO-IHR and OIE PVS Pathway and FAO animal influenza regional and country projects.

- Establish and maintain periodic high-level meetings between Ministries, and include representation of commercial sectors (large and small), consumer groups, transport, and other stakeholders as needed.

- Support existing mechanisms of communication between national animal health and public health authorities and technical staff (including joint investigations, mechanisms for sharing of key data, and joint risk assessment) or develop them.

- Ensure that legal barriers to collaboration are minimized and that lines of communication within sectors and among national administrative units are efficiently functioning.

- Implement aligned surveillance of animal influenza viruses in human, domestic animal and wildlife populations, including consideration of the impact disease control measures might have on detection and reporting.

- Investment into economically viable and socially acceptable safe practices (compliance to regulations and standards) in the poultry and swine production and marketing industries at community and commercial level.

- Establish continuous dialogue with poultry and swine production sectors to jointly understand critical control points for improved surveillance and implementation of targeted intervention, if needed.

CONCLUSIONS

Cross-sectoral and multi-disciplinary collaboration improves the ability to understand and target adequate influenza prevention and control measures to reduce risks to animal and public health. The ability of the animal health sector to control animal influenza – including early detection and compensation mechanisms and working cross-sectorally at the human-animal-ecosystems interface to gain a better understanding of mechanisms of influenza emergence and spread – will directly reduce threats to public health and livelihoods. Because influenza viruses are unpredictable, establishing robust national animal and public health systems – including effective surveillance, diagnosis and intervention- and linkages between the systems are crucial for early identification and control of the next emerging influenza virus and potentially contribute to controlling or preventing threats from other pathogens.

KEY LINKS AND REFERENCE DOCUMENTS

FAO/OIE Global Strategy for the Progressive Control of Highly Pathogenic Avian Influenza. Available at: www.un-influenza.org/node/2468.

FAO (2011). Approaches to Controlling, Preventing and Eliminating H5N1 Highly Pathogenic Avian Influenza in Endemic Countries Available at: www.fao.org/docrep/014/i2150e/i2150e.pdf.

FAO. Wild Birds and Avian Influenza. Available at: ftp://ftp.fao.org/docrep/fao/010/a1521e/a1521e.pdf (2007).

Verona 1 and 2 (www.fao.org/avianflu/en/conferences/verona_2008.html; www.fao.org/avianflu/en/conferences/verona_2010.html).
OFFLU: www.offlu.net.
GLEWS: www.glews.net.
Gene Observatory initiative.
OIE 5th Strategic Plan.

FAO Action Plan (2011-2015). Applying Lessons Learned from Highly Pathogenic Avian Influenza in the Prevention and Containment of Major Animal Diseases and Related Human Health Risks. Available at: www.fao.org/docrep/meeting/021/ma145e.pdf (2010).

WHO. Update on human cases of highly pathogenic avian influenza A(H5N1) virus infection, 2010. Weekly epidemiological record, 22 April 2011, 86th year, No. 17, 2011, 86, 161–172. Available at: www.who.int/wer.

WHO. Antigenic and genetic characteristics of influenza A(H5N1) and influenza A(H9N2) viruses and candidate vaccine viruses developed for potential use in human vaccines. September 2011. Available at: www.who.int/influenza/resources/documents/2011_09_h5_h9_vaccinevirusupdate.pdf.

ANNEX 4-2: JOINTLY ADDRESSING ANTIMICROBIAL RESISTANCE (AMR) AT THE HUMAN–ANIMAL–ECOSYSTEMS INTERFACE TO PRESERVE EFFECTIVENESS OF ANTIMICROBIAL AGENTS

CONCEPT STATEMENT

Antimicrobial agents are crucial to being able to treat infections of humans and animals. Use, and particularly inappropriate use, in both humans and animals can greatly accelerate development of resistance to these agents in pathogens. Human health and animal health sectors working together nationally and globally, and in collaboration with other stakeholders in the private and public sectors, to align policies, strategies, and activities can reduce the emergence and spread of antimicrobial resistance.

BACKGROUND

The discovery of antibiotics to treat bacterial infections and to combat infectious diseases in humans and animals was one of the most important achievements of the 20th Century.

Since antimicrobials were first mass produced, initially for human treatment and subsequently for veterinary practice, their use has been associated with the risk of emergence of AMR. Inappropriate use in humans and animals has accelerated its emergence. At the same time, the development/discovery of new antimicrobial drugs has slowed, to the extent that the development of AMR is now exceeding the availability of new antimicrobials.

Antimicrobials are essential medicines in human and animal clinical practice. Preserving their efficacy for both human and animal health, and to protect the livelihoods of those who depend on livestock, are major public health, agricultural and social priorities.

AMR is a global threat to health. It challenges the effective control of infectious diseases, jeopardizes progress on health outcomes by increasing morbidity, hospitalisation and mortality and imposes huge costs on societies, including strongly impacting on animal health and welfare. Infections caused by resistant microorganisms often fail to respond to standard treatments, resulting in prolonged illness, and increased costs. Treatment failure has not only health and economic impacts, but also results in repetition of treatments or use of multiple drugs in treatment of both humans and animals. There has been much debate about its origins, and linkages to misuse globally increasing AMR. Elimination of inappropriate use of antimicrobial agents is necessary to limit the emergence of new AMR patterns. In high selection pressure ecosystems, some AMR will always occur. So, targeted containment strategies must be developed and implemented.

BENEFITS OF INTERSECTORAL COLLABORATION TO GLOBAL MANAGEMENT OF AMR

- Addressing AMR will require the combined and coordinated efforts of human and animal sectors, working in close collaboration to define common goals and objectives that take into account the needs and challenges inherent to each sector, such as:
  - Effectively monitoring the situation.
  - Keeping antimicrobials effective and useful to combat disease.
  - Promoting the prudent and rational use of antimicrobials.
  - Ensuring access to antimicrobials of assured quality under appropriate global, multi-sectorial responses and systems of good governance on international, regional and national levels.

- AMR also requires management across ecosystems and geographic locations. The emergence of AMR in disease-causing bacteria in one ecosystem or one geographical area can spread in bacteria in that ecosystem and be transferred to create resistance in bacteria in another ecosystem or another geographical area. AMR should therefore be addressed globally in a holistic and coordinated manner across the animal, food and human sectors.

- Improved intersectoral collaboration mechanisms in countries where the regulation of veterinary and human medicines (approval, labelling, prescription use) is managed by different entities.

ONGOING COLLABORATIVE PROCESSES AND EXAMPLES OF SUCCESSFUL PROGRAMMES

- A tripartite FAO/OIE/WHO consultative process on non-human use of antimicrobials and AMR was initiated in 2003 to assess the public health risks associated with the use of antimicrobials in food animal production and formulated recommendations and options for risk management. An important outcome of this process was the establishment by the Codex Alimentarius Commission of the Ad-hoc Codex Intergovernmental Task Force on Antimicrobial Resistance.

- In the framework of its work, the Task Force has developed, in collaboration with the OIE, the Guidelines on Risk Analysis of Foodborne Antimicrobial Resistance (CAC/GL 77-2011 (adopted by the Codex Alimentarius Commission in July 2011). The Guidelines provide governments with a science-based framework for assessment and management of AMR risks at national level. However, many developing countries lack the necessary technical capacities to implement the guidance.

- In 2009 the USA and EU established a Transatlantic Taskforce on Antimicrobial Resistance whose report in 2011 highlighted, among other matters, the need for consistent methods and standards for measuring antimicrobial use, resistance, and for risk assessment.

- FAO and WHO are currently collaborating on a project in Kenya, aimed at strengthening national/regional policies, capacities and systems for detection, monitoring, regulation and management of AMR risks in meat (poultry, beef and pig) value chains; and in humans. Central to the project is an approach that undertakes a whole food chain study to assess and quantify microbial contamination and AMR pathogens, in order to identify the critical stages at which prevention and control measures can be implemented most effectively. This activity is linked to a series of global pilot studies being undertaken by the WHO Advisory Group on Integrated Surveillance of AMR (AGISAR).

HUMAN AND ANIMAL HEALTH SYSTEM CHALLENGES

- Lack of harmonisation of protocols and methodologies to monitor AMR and antimicrobial usage and the need for international standards.

- Lack of surveillance data on AMR and antimicrobial usage in both human and animal sectors to support AMR risk analysis (risk assessment, risk management and risk communication).

- Lack of technical capacity to undertake monitoring and surveillance of AMR and antimicrobial usage, and AMR risk analysis.

- Insufficient research (and a lack of coordination of available research) to determine the effectiveness of policies to reduce the risk of development of AMR in humans and animals.

- Lack of new drugs and the need to support research and development.

- Lack of legislation to ensure access to quality drugs and restricted use.

- Need for good governance covering all sectors related to authorisation and use of antimicrobials.

- Need for political commitment and good governance in the following areas:
  - laboratory expertise,
  - harmonised international standards and guidelines,
  - capacity to implement these standards and to establish appropriate regional/national legislation,
  - harmonised surveillance and monitoring of antimicrobial use and resistance.

NEXT STEPS FOR ACTION AT COUNTRY LEVEL

- Establish formal mechanisms of collaboration between ministries/departments/ agencies responsible for human health, animal health, agriculture and livestock, food control, environment and other relevant ministries and authorities.

- Develop concordance between veterinary and human medicines regulation, approval, prescription control and monitoring of use (including with regard to the "critically important antimicrobials" in both sectors).

- Engage in the development and adoption of international standards and protocols to facilitate information sharing and harmonisation in surveillance of AMR and antimicrobial use in humans and animals.

- Develop national, and where appropriate regional, collaborative monitoring and surveillance programmes that involve human health and animal health sectors, to monitor current and emerging AMR patterns.

- Support development of institutional and technical capacities for AMR and antimicrobial usage monitoring and surveillance; and AMR risk analysis.

- Set up multidisciplinary task forces involving authorities in public health, veterinary public health, environmental health and food safety to act on surveillance data.

- Set up joint evaluation programmes between human and animal sectors to measure the effectiveness of management actions to reduce the prevalence of resistance in human and animal sectors.

- Coordinate common messages and outreach.

CONCLUSIONS

While there are many initiatives and programmes at a regional or global level, progress cannot be made without appropriate governance and legislation control and penalties, good quality information, capacity building, and risk assessment at a national/regional level. Close cooperation between the human, animal, agriculture and other sectors at a national level is therefore essential in understanding and combating the problem of antimicrobial resistance.

KEY LINKS AND REFERENCE DOCUMENTS

Codex ad hoc Intergovernmental Task Force of Antimicrobial Resistance. Available at: www.who.int/foodborne_disease/resistance/codextf/en/index.html.

WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (AGISAR). Available at: www.who.int/foodborne_disease/resistance/agisar/en/index.html.

WHO list of Critically Important Antimicrobials (CIA). Available at: www.who.int/foodsafety/foodborne_disease/CIA_2nd_rev_2009.pdf.

ANNEX 4-3: JOINTLY ADDRESSING RABIES

CONCEPT STATEMENT

Rabies is a widespread, neglected and under-reported zoonosis with an almost 100% case fatality rate in both humans and animals, and causing a significant social and economic burden in many countries worldwide. It is estimated that at least 55,000 people die of rabies each year in Africa and Asia alone and some 14 million people receive post-exposure prophylaxis (PEP). More than US $ 1 billion is spent worldwide because of this disease. On a global level, the main reservoir of rabies is the dog, responsible for almost 99% of fatal rabies cases in humans through bites or scratches. The control and elimination of rabies in dogs through vaccination remains the most cost-effective single intervention to protect humans from contracting the disease. In spite of the availability of effective tools to control rabies in dogs, the success of the implementation of national rabies control programmes remains dependent on good governance of Veterinary Services, political commitment, community participation, and adequate financial resources at the global, regional, national and local levels.

BACKGROUND

- Rabies is a serious human health and animal health problem, affecting livestock, pets, and wildlife. Most human deaths from rabies are associated with exposure to a rabid canine.

- Rabies is a disease for which disease prevention and control can be carried out in accordance with the principles set out in the Tripartite Concept Note, and intersectoral collaboration is fundamental for effective disease prevention and control.

- The control and elimination of rabies in dogs through adequately sustained vaccination programmes combined with public awareness, responsible dog ownership, and humane dog population management remains the most cost-effective way to protect humans from contracting the disease,.

- Vaccination of more than 70% of the total dog population in an area combined with humane dog population management quickly lead to a marked reduction of the number of human deaths from rabies.

- International standards and guidance exist for the prevention, surveillance and control/ elimination of the disease in both animal and humans.

- The on-going assessment of the global burden of rabies should help to advocate for dog rabies control and elimination worldwide. This would include comparison of the cost of mass dog vaccination campaigns and the burden of rabies in humans, taking into account the cost of PEP, Rabies immunoglobulins (RIG) and the cost of associated networks to properly store and maintain access to effective PEP.

COLLABORATIVE PROCESSES BEING USED AND EXAMPLES OF SUCCESSFUL PROGRAMMES

Collaborative processes

- National Committees/Taskforce for human and dog rabies prevention and control based on the principal of inter-sectoral collaboration.

- Regional rabies networks in almost all affected regions and the Global Alliance for Rabies Control/Partners for Rabies Prevention, international rabies reference laboratories and collaborating centres.

- Public private partnerships involving human and animal health authorities, local authorities (municipalities), vaccine suppliers, NGOs, foundations, etc., helping to overcome challenges to the implementation of dog rabies control programmes.

- Establishment of rabies vaccine banks.

Examples of national/regional programmes

- Mexico, South American Countries and the Caribbean: rabies control programmes supported by the Pan American Health Organization.

- China: pilot dog vaccination programme in Guangxi.

- South Africa: rabies control programme in Kwa-Zulu Natal (KZN).

- Philippines: rabies control programmes in three Visaya provinces.

BENEFITS OF INTERSECTORAL COLLABORATION TO NATIONAL AND GLOBAL RABIES CONTROL

The significant burden that rabies imposes on human health is the main reason why governments will consider committing resources to its prevention and control. Advocacy for rabies prevention and control carried out at the global level by the Tripartite to guide institutions, governmental or non-governmental organisations for the control of rabies.

Conversely a stronger involvement of global animal heath institutions in global rabies control should be beneficial to global health. At national level an increased involvement of animal health services in rabies control particularly dog rabies control should in the long term (10 years) once animal disease elimination is reached and maintained, decrease the need for human post-exposure prophylaxis (PEP) delivery and thereby reduce PEP cost for the public health sector and the society as a whole.

Advocating at the global level sharing of national public health sector resources with the veterinary services should assist them in fulfilling their claimed responsibilities.

Sharing of animal and human data on rabies at the global and national level should facilitate the identification of areas of major concern. As animal rabies reporting/ surveillance systems are weak in most countries (especially in the veterinary sector), conducting outbreak investigations jointly and sharing of human rabies data with the animal sector should help stimulating surveillance in all susceptible and reservoir animal species.

- Rabies is an exemplary 'One Health' model disease, and a disease that if not addressed in an inter-sectoral manner tends to fall between the cracks.

- Inter-sectoral support from Ministers would further drive international / global support for national rabies control programmes and opportunities to leverage effects such as global and regional rabies vaccine banks.

- International support will help promote research and development for new diagnostics, interventions, and other necessary research.

- Widespread commitment from Ministers to an inter-sectoral approach should promote inter-sectoral collaboration as the norm for national rabies control programmes, including establishment of inter-sectoral rabies task forces.

- Inter-sectoral collaboration would support the development and dissemination of coordinated messages on rabies prevention and control through various channels.

CHALLENGES TO GLOBAL RABIES CONTROL

- Veterinary Services often prioritises the prevention and control of livestock diseases and do not address dog-mediated public health risks.

- Dog and human rabies have the highest incidence in countries with least resources to effectively manage human exposures or control dog rabies.

- Inadequate diagnosis and surveillance of human and animal rabies leads to underestimations of the incidence of rabies in many countries where dog rabies exists. As a result rabies is not considered a public health or veterinary priority, and there is little incentive to invest resources in improving rabies surveillance and/or controlling the disease – a perpetuating 'cycle of neglect'.

- PEP is the only way to prevent human rabies after a suspect exposure, particularly in the absence of effective dog rabies control and surveillance activities. Yet, PEP requires the use of expensive biological products (both vaccine and immunoglobulin) which are also in limited supply and requires a network of centres to administer PEP, often not available or financially feasible for exposed individuals in countries where rabies exposure is the highest.

- Knowledge of the dog populations is critical to ensure implementation of canine vaccination programmes that achieve at least 70% coverage, but is often not available.

- Rabies control programmes also need to address stray dog populations in a humane manner. In situations where the rabies virus is effectively maintained in wild carnivore reservoirs different control measures must be adopted. When bats are the primary reservoir for rabies virus, rabies cannot be controlled given the present state of knowledge, and public education and preventive immunisation of groups at particular risk (humans or other animals) may be warranted.

- Budgeting for rabies control in different ministries is often done in isolation, without the acknowledgement of cross-sectoral responsibilities and need for coordination.

- The initial cost of comprehensive national human and dog rabies control programmes may be perceived as high (from one to three years), as it combines the costs of both human rabies prevention and dog rabies control.

GENERAL PRINCIPLES FOR INTERSECTORAL COLLABORATION AND RABIES CONTROL

- All governments, and all relevant Ministries, consider rabies control as a high priority and ensure that national legislation provides for rabies to be a notifiable disease.

- Comprehensive national human and animal rabies control programmes based on effective intersectoral collaboration should be developed in all affected countries.

- Surveillance (including laboratory surveillance) and reporting of rabies, in humans, domestic animals and wildlife should be continually improved nationally, and the data so generated should be shared across sectors and with OIE and WHO.

- Veterinary Services, with the relevant service of the Ministry of Health, municipalities and local communities, should jointly advocate for appropriate financial support from the national budget and other sources to eliminate rabies in the animal reservoir (when possible).

- Combination of rabies control programmes with interventions aimed at the prevention or control of other zoonoses should be actively considered.

POTENTIAL CONCRETE NEXT STEPS FOR ACTION

- Building upon existing work of individual regions or sectors to draft global principles for inter-sectoral collaboration in rabies control programme, leading to harmonisation of strategies and control measures between Ministries and between neighbouring countries.

- Mobilising resources to scale up implementation of successful programmes, while taking into account the local context.

- Increasing the use of quality vaccines and diagnostic tests complying with OIE standards, including through establishment of Global/Regional Vaccine Banks.

- Broader implementation of educational awareness campaigns (politicians/Ministries, dog owners, children and greater public) making greater use of World Rabies Day.

CONCLUSIONS AND RECOMMENDATIONS

– National and global control of rabies must have primary focus on controlling the disease in the animal (canine) reservoir.

– Tools are available to control and eliminate rabies in the canine reservoir, and evidence has shown programmes using these tools can be successful and have a very good cost/benefit ratio.

– Any rabies control programme requires financial support and inter-sectoral collaboration – both in the elimination phase and in the maintenance of control phase.

KEY LINKS AND REFERENCE DOCUMENTS

Rabies blueprint. Available at: www.rabiesblueprint.com.

Rabies and dog population control chapters of the OIE *Terrestrial Animal Health Code*. Available at:
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ANNEX 5

Key elements of effective cross-sectoral collaboration

KEY ELEMENTS OF EFFECTIVE CROSS-SECTORAL COLLABORATION

Key supporting elements

1 Political will and high-level commitment
2. Trust
3. Common objectives and priorities
4. Shared benefits
5. Strong governance structures, aligned legal frameworks, and recognition of existing international standards
6. Adequate and equitably distributed resources
7. Identification and involvement of all relevant partners
8. Coordinated planning of activities
9. Guidance on implementation of cross-sectoral collaborations
10. Capacity development
11. Strong and effective health systems within the individual sectors

Key operational elements

A. Joint cross-sectoral coordination mechanisms
B. Routine communication
C. Joint simulation exercises
D. Data sharing
E. Joint risk assessment
F. Active cooperation on disease control programmes

ANNEX 6

Acronyms used

AMR	Antimicrobial Resistance
FAO	Food and Agriculture Organization of the United Nations
GLEWS	FAO–OIE–WHO Global Early Warning System for Major Animal Diseases, including Zoonoses
HAIRS	Human–Animal Infections and Risk Surveillance group (UK)
HLTM	High-Level Technical Meeting to Address Health Risks at the Human–Animal–Ecosystem Interface)
HPAI	Highly pathogenic avian influenza
IHR	International Health Regulations (of the World Health Organization)
IMCAPI	International Ministerial Conference on Avian and Pandemic Influenza
NGO	Non-governmental organization
OIE	World Organisation for Animal Health
PVS	Performance of Veterinary Services (OIE PVS Tool)
SAGARPA	La Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación of Mexico
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales of Mexico
UNICEF	United Nations International Children's Emergency Fund
UNSIC	United Nations System Influenza Coordination
WHO	World Health Organization

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Summary

As presented within the objectives of this meeting, the Food and Agriculture Organization of the United Nations, the World Organisation for Animal Health, and World Health Organization, with the support of the United Nations System Influenza Coordination sought to conduct a High-Level Technical Meeting to Address Health Risks at the Human–Animal–Ecosystem Interface (HLTM) hosted by Mexico to advance the implementation of One Health approaches in countries and complement the other meetings that have taken place on this subject. This meeting had several objectives specifically related to the Tripartite collaboration: to identify ways to implement the principles outlined in the Tripartite Concept Note; to incorporate national-level approaches and strategies into discussions of these principles; and to reach consensus on technical arguments that could be used to obtain political support by convening similar discussions at the ministerial level. A main outcome was identification of key supportive and operational elements of effective cross- sectoral collaboration to address health risks at the human–animal–ecosystem interface. The HLTM provided an important contribution in advancing our ability to address risks at the human–animal–ecosystem interface. The full achievement of the meeting objectives was, and will continue to be, interlinked with the continued collaboration between the Tripartite organizations and their partners in these efforts – partners that include other international actors, regional and national governments, non-governmental and academic partners, including in some cases establishing public–private partnerships. Each entity has an important role to play and often has a slightly different group of stakeholders or methods to reach common stakeholders. Harnessed, the combined roles of these various partners should be adequate to ensure fundamental progress towards broadly implementing cross sectoral approaches to health issues at the human–animal–ecosystem interface.

WHO

United Nations