

Adopting the One Health approach in international practice

Taking H5N1 as an example, our author describes how global collaboration in combating this disease turned into a One Health approach which has since gained significance reaching way beyond tackling zoonotic diseases.

By Katinka de Balogh

In late 2003, poultry farms in the Central and Northern Regions of Thailand experienced large-scale die-off. Highly pathogenic avian influenza (HPAI) virus of the H5N1 subtype, also called bird flu, was confirmed in poultry on the 23rd January 2004, the same day that the Thai Ministry of Public Health (MOPH) announced two laboratory-confirmed cases of H5N1 virus in children, who later died of the disease. In the meantime, other countries in East and Southeast Asia also reported infections in poultry and humans. Scientists and politicians feared that this could be the start of a global pandemic, similar to the Spanish flu caused by H1N1 influenza, killing an estimated 20–50 million humans globally between 1918 and 1920. Parts of the world started stocking up on Oseltamivir (commercially known as Tamiflu), an antiviral medication used to treat and prevent influenza A and influenza B (flu), including H5N1. In 2005, in response to the further spreading epidemic, various governments stockpiled quantities of Oseltamivir in preparation for a possible pandemic, leading to overall shortages of the drug.

At the time, the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) called countries to address “bird flu” at its source in animals to avoid its spread to humans. As H5N1 occurs naturally in wild waterfowl, it can spread easily to domestic

poultry, especially in rice-farming areas where domesticated ducks are kept on post-harvest rice paddy fields. These rice paddy fields are equally attractive to wild birds and are therefore viral transmission points between wild and domesticated birds. The understanding of the ecology in which the virus transmits was key for the development of viable disease control interventions. Furthermore, the identification of human risk behaviour linked to persons handling infected poultry (with fortunately, no sustained human-to-human transmission) provided the basis for risk communication messages preventing the spread from infected poultry to farmers, traders or consumers.

This example illustrates the need for different sectors such as Ministries of Health, Agriculture and the Environment, as well as various disciplines ranging from human and animal health professionals, wildlife ecologists, epidemiologists, communication experts and behavioural scientists to come together under a One Health umbrella to address H5N1. The aim is to identify the emergence of a disease at an early stage through good surveillance and reporting, the collection and shipment of animal samples, reliable laboratory diagnostics and triggering contingency plans put in place and practised as part of an emergency preparedness and response concept.

From the first global strategic framework to national task forces

In January 2006, a pledging Conference in Beijing, China brought together officials from half the world's nations to come up with the finances for a three-year action plan to address H5N1 epidemic. At the time, the disease had killed nearly 80 people, mostly in Asia, and had spread to the Middle East and into Europe, with Turkey confirming its fourth human fatality. A United Nations system coordinator for avian and human influenza was appointed, and Ministers of Health and Agriculture would meet on a regular basis to further assess global progress in controlling Highly Pathogenic Avian Influenza (caused by H5N1 virus) and propose actions to further reduce and potentially eliminate the disease. In October 2008, four specialised agencies, FAO, OIE, the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), together with the World Bank and the UN System Influenza Coordinator (UNSIC), developed “Contributing to One World, One Health (OHOW)”, a Strategic Framework for Reducing Risks of Infectious Diseases at the Animal–Human–Ecosystems Interface. The document was launched in 2008 during the Sharm-El-Sheikh International Ministerial Conference on Avian and Pandemic Influenza (IMCAPI) event in Egypt. The objective of the Framework was to diminish the risk and



Children are at particular risk of catching rabies from dogs.

Photo: Jörg Böhling

minimise the global impact of epidemics and pandemics due to emerging infectious diseases by enhancing disease intelligence, surveillance and emergency response systems at national, regional and international levels, and by supporting them through strong and stable public and animal health services and effective national communication strategies. The OWOH approach (which later became just One Health) references the “Manhattan Principles”, which were developed in 2004 during a symposium organised by the Wildlife Conservation Society (WCS) and hosted by The Rockefeller University and recognise the intimate linkages among the human, animal and ecosystem health domains.

Since then, One Health has evolved. There have been seven International Ministerial Conferences on Avian and Pandemic Influenza (IMCAPI), bringing together the Ministers of Health and Agriculture to discuss H5N1 and other emerging threats. At country levels, inter-ministerial committees and task forces were established to focus on avian influenza in first instance, but gradually they also transitioned to address other zoonotic diseases.

Widening the scope – One Health not only for emerging zoonotic diseases

Beside the importance of emerging zoonotic diseases in 2005, the Joint WHO/DFID-AHP (animal health programme) Meeting on neglected zoonotic diseases mentions the importance of One Health as a way of dealing with various health problems in both people, their livestock and other domestic and wild animals they depend on. Gradually, rabies emerged as the One Health model disease that would require collaboration and communication between animal and human health. In Bali, Indonesia, after the introduction of rabies in late 2008, with the province’s authorities, FAO developed “Integrated Bite Case Management (IBCM)”. It entailed that after somebody had reported a dog bite to a health centre, the animal health side would be informed and investigations by both sectors would be coordinated to see if there were further animals suspected of having rabies and if further persons had been exposed to rabid animals. IBCM is a good example how One Health translates into action.

One Health was proposed as a concept to foster interdisciplinary collaboration and was adopted with great enthusiasm, especially by the veterinary profession and by the international agencies charged with control of zoonoses, such as FAO and OIE. World-wide, the

TABLE-TOP SIMULATION EXERCISES FOR ZOO NOTIC DISEASES

National table-top simulation exercises have been developed by the Food and Agriculture Organization of the United Nations (FAO) and its partners to strengthen in-country capacities for emergency preparedness and response for zoonotic diseases at the human-animal-ecosystems interface. The two-day, room-based simulation exercises bring together professionals of different sectors involved in addressing emerging disease outbreaks in human and animal populations (e.g. Ministry of Agriculture and Ministry of Health professionals, veterinary and public health epidemiologists, laboratory diagnosticians, private service providers, communication experts, environment and wildlife

services, civil defence, farmers’ associations). The simulation is based on a scenario describing a fictitious outbreak, from its suspicion to its control, and participants address questions covering the different activities which would be carried out in response to the different phases of the evolving disease situation. Through the simulation exercise, national preparedness and capabilities in controlling the emergence of a zoonotic disease are assessed. The gaps identified are used to enhance a country’s contingency plans and to develop a national action plan to improve its preparedness and response capacity for the prevention and control of zoonotic threats.

veterinary profession promoted the concept of One Health to address, besides zoonotic diseases, issues such as food safety, food security, antimicrobial resistance, climate change and the human-animal bond. Within the human health sectors it was also mainly the veterinarians working in public health who embraced One Health. Nevertheless, in 2010 FAO, OIE and WHO agreed on a Tripartite Concept Note, “The FAO–OIE–WHO Collaboration – Sharing responsibilities and coordinating global activities to address health risks at the animal–human–ecosystems interfaces”. This Tripartite partnership made a commitment to jointly address health risks at the interface, recognising 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 November 2011, a High Level Technical Meeting (HLTM) to address health risks at the human-animal-ecosystems interface was organised by the Tripartite with UNSIC and Mexico’s Ministries of Health, Agriculture and Environment. The meeting in Mexico provided a venue for stakeholders from the national health, agriculture and environmental sectors and from technical, regional, and donor organisations to contribute their perspectives and expertise. Participants from the different sectors considered, and came to agreement on, cross-sectoral technical and policy approaches to address the mutual priorities such as zoonotic influenza, rabies and antimicrobial resistance (AMR). During the meeting, the key princi-

ples for cross-sectoral coordination, collaboration and communication were developed (see Box on next page), as were the next steps for moving forward to implement zoonotic influenza, rabies and AMR as three Tripartite priority issues under One Health.

Antimicrobial resistance: engaging the agriculture and environment sectors

Antimicrobial resistance is a complex, multi-faceted problem that threatens human and animal health, the global economy, and national and global security. Beside the public health and veterinary sectors, addressing antimicrobial resistance requires the engagement of the wider agriculture and environment sectors as part of One Health. After adoption of various resolutions by the highest fora of the Tripartite in 2015, at the United Nations General Assembly in 2016, global leaders recognised AMR as one of the biggest threats to global health, endangering other major priorities, including human development. Heads of State and Heads of Delegations addressed the seriousness of the situation and agreed on sustainable, multisectoral approaches to tackling antimicrobial resistance. Countries committed to developing integrated AMR National Action Plans (NAPs). In 2017, the Tripartite launched a commitment, providing multi-sectoral, collaborative leadership in addressing health challenges including AMR.

With increasing livestock and aquaculture production, especially often, the use of cheap antibiotics replaced the adoption of good hygienic practices and overall biosecurity. Even in the crop sector, antibiotics are used, albeit certainly to a lesser extent compared to in animal production, to combat plant bacterial diseases



Rice paddy fields are viral transmission points between wild and domestic birds.

Photo: Adobe Stock

such as fireblight of apples, citrus canker and the use of streptomycin to protect rice crops. The use of antibiotics on crops is generally denominated as “pesticides”. Therefore, besides the animal production sector, it is also important to involve the crop sector and the wider agriculture sector as part of addressing antimicrobial resistance in a One Health manner. In addition, so far, the environmental sector has been the last one coming to the table in the discussions on tackling AMR. The problem of run-off from all types of farms where antimicrobials are used for crops, livestock and aquaculture and effluents from slaughterhouses, hospitals and antimicrobial-producing industries as well as from waste dumping sites clearly requires close collaboration with those dealing with the environment. Especially in the Asia-Pacific region, the FAO/OIE/WHO Tripartite has been working intensively with the United Nations Environment Programme (UNEP) on AMR. For the World Antibiotic Awareness Week in 2019, the video “Don’t

let antimicrobials take control: Be responsible when using antibiotics!” was collaboratively produced by FAO, OIE, WHO and UNEP to raise awareness on the risks of AMR, including the drivers of AMR spread between animal-human-food and the environment.

From farm to fork to food systems: why we need a holistic approach

The FAO/WHO Codex Alimentarius is a joint Food Standards Programme which held its first meeting in 1963 and aims at protecting consumer health and promoting fair practices in food trade by linking agriculture and health sectors. While initially a linear correlation from farm to fork as a way to strengthen food chains and enhance food safety, nowadays, we tend to talk about food systems in view of the complexities and interconnections from production to consumption of our food. Although One Health was in first instance conceived to

address infectious diseases, the multidisciplinary and multi-sectoral approach has also made it valuable focusing on residues from various sources including pesticides, heavy metals and antimicrobials in feed, food, agriculture as well as the environment.

While currently the COVID-19

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

* Developed during the High-Level Technical Meeting to Address Health Risks at the Human-Animal Ecosystems Interfaces, Mexico City, Mexico 15-17 November 2011.

pandemic is ravaging, we do not know what is yet to come. Lessons learned from the current pandemic include the unprecedented human and socio-economic global impacts of an emerging zoonotic disease and the need to address drivers of disease emergence and spill-over. More than ever, it is important to invest in coordinated mechanisms, policies and capacities at national, regional and global levels to prevent, prepare and respond to health threats at animal-human-environment interfaces through the application of One Health.

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