Early warning systems, database and information systems for avian influenza surveillance


Early warning systems are developed to rapidly detect the introduction or sudden increase in the incidence of any disease of livestock which has the potential of developing to epidemic proportions and/or causing serious socio-economic consequences or public health concerns. Early warning activities, mainly based on disease surveillance, reporting and epidemiological analysis are supported by information systems that enable integration, analysis and sharing of animal health data combined with relevant layers of information such as socio-economic, production and climatic data. Animal health information systems are often linked to geographical information systems (GIS) that provide a visual representation of spatio-temporal patterns related to a given disease situation. Data integration, analysis and mapping represent a key step towards a better understanding of the distribution and behaviour, source and evolution of a disease (or infection) for the definition of appropriate cost-effective disease control strategies.

In the aftermath of the avian influenza (AI) crisis triggered by the spread of the highly virulent avian influenza H5N1 strain, the world has been on alert to curb the spread of the disease and mitigate the risk of emergence of a potential human pandemic. Existing early warning systems such as the ones developed by the World Organization for Animal Health (OIE), the European Union, the World Health Organization and the FAO through its EMPRES programme have been activated to closely monitor the avian influenza situation worldwide.

The FAO Global Animal Health Information System (EMPRES-i) is a web-based secured application that provides a platform to record, analyze and monitor data on AI, both in wild bird populations and domestic poultry. The system aims at delivering timely and accurate situation updates as well as relevant risk analysis distributed in electronic format (AIDE News, HPAI Updates, EMPRES Watch messages, Disease Tracking List) to member countries and partner institutions. FAO, in collaboration with specialised institutions involved in wildlife surveillance and monitoring (CIRAD, Wetlands International and the Wildlife Conservation Society), has also started a programme of intensified and targeted surveillance of key ecological sites for the monitoring of avian influenza in wild bird populations.

Other major initiatives are worth mentioning such as the Global Early Warning and Response System (GLEWS) for major transboundary animal diseases. This is a joint system that builds on the added value of combining and coordinating the alert and response mechanisms of OIE, FAO and WHO for the international community and stakeholders to assist in prediction, prevention and control of animal disease threats.

In the light of the recent spread of AI into Europe, Caucasus and Africa, early warning and information systems, as well as targeted surveillance initiatives for the surveillance of AI in wild birds, are developing fast around the world. In this context, a multidisciplinary approach that brings the competencies and skills of veterinarians, wildlife specialists, ornithologists, virologists, molecular biologists, and data management and GIS specialists is required. In its endeavour to control the spread of AI, the international scientific community should join efforts to streamline the integration and exchange of the large amounts of surveillance data that are being produced, harmonize surveillance protocols, increase data sharing, carry out joint risk assessments and coordinate all surveillance efforts using state-of-the-art information systems and technologies.

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