

GLEWS+

The Joint FAO–OIE–WHO Global Early Warning System for health threats and emerging risks at the human–animal–ecosystems interface

A concept paper



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BACKGROUND

The Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE), and the World Health Organization (WHO) recognize a joint responsibility to minimize the health, social and economic impact from diseases arising at the human-animal interface by preventing, detecting, controlling, eliminating or reducing disease risks to humans originating directly or indirectly from domestic or wild animals, and their environments¹.

An important aspect of efforts to mitigate potential health threats at the human-animal-ecosystems interface is early warning, supported by robust risk assessment to inform decisions, actions, and timely communication between agencies and sectors responsible for human health, animal health, wildlife, and food safety. In 2006, in response to health threats such as H5N1 highly pathogenic avian influenza (HPAI) and the severe acute respiratory syndrome (SARS), the three organizations consolidated efforts to establish a Global Early Warning System for Major Animal Diseases Including Zoonosis (GLEWS). GLEWS became one of the mechanisms used by the OIE, FAO, and WHO together for monitoring data from existing event-based surveillance systems and to track and verify relevant animal and zoonotic events. This mechanism has provided a global platform that brought together expertise, data, functional networks, operational systems and stakeholders to improve interorganizational coordination and support to Member countries for detecting, preventing and controlling threats to health and the food chain. This mechanism of the tripartite partnership has reinforced complementarities, synergies and harmonization between the organizations and has reduced duplication and gaps. GLEWS embodies a unique cross-sectoral and multidisciplinary collaborative tool in addressing health risks at the human-animal-ecosystems interface.

Over the years since its establishment, GLEWS has become a powerful mechanism to bring together the information and expertise existing in the three organizations and associated networks. However, it is also clear that it could be improved by conducting more cross-sectoral, iterative risk assessment when issues emerge at the human-animal-ecosystem interface that would benefit from the agencies working together. The following additions would significantly strengthen the system's ability to support and direct the management of identified risks:

- generation of ad hoc and planned risk assessments aimed at providing timely guidance on prevention and supporting the response mechanisms of the three organizations;

¹ *The FAO-OIE-WHO Collaboration. Sharing responsibilities and coordinating global activities to address health risks at the animal-human-ecosystems interface. A tripartite concept note.* April 2010; www.glews.net/wp-content/uploads/2011/04/FINAL_CONCEPT_NOTE_Hanoi.pdf.

- monitoring of wildlife disease events to improve understanding of risks to people and livestock;
- development of timely and appropriate messages contributing to tripartite risk communications towards informing and actively engaging key partners, Member countries and the international community;
- linking with other key networks and mechanisms along the farm-to-table continuum.

WHAT THE IMPROVED SYSTEM WILL DO

In addition to the activities of the existing GLEWS, the proposed system – *GLEWS+* – will provide a unique cross-sectoral mechanism for conducting robust and timely joint risk assessments, aimed at formulating risk management options for health events at the human-animal-ecosystems interface. These options will then be communicated in a timely, coordinated and relevant way within the three international organizations, hereby contributing to risk communications of the three organizations to relevant stakeholders, the public and the international community. *GLEWS+* will:

1. systematically link to areas such as wildlife health, food and biological threats;
2. drive more advanced and cross-sectoral risk assessment when a need is identified; and
3. provide more opportunities for participation by a broader range of stakeholders via specific working groups established on priority areas.

GLEWS+ contributes to the tripartite continued work to advance from reactive to proactive preparedness and prevention, through joint risk assessment for targeted and timely action.

GLEWS+: BUILDING ON EXISTING SYSTEMS

GLEWS+ will rely on functional and sensitive indicator- and event-based surveillance systems, geared towards early and reliable detection of health events of potential concern at the human-animal-ecosystems interface. As part of its comprehensive approach, *GLEWS+* will link with networks such as the International Food Safety Authorities Network (INFOSAN)² to ensure and promote seamless action throughout the food chain. The connection to INFOSAN will give access to a wide range of expertise on food safety issues and ensure that the public health, veterinary and agriculture sectors are engaged in early warning, information exchange and risk assessment along the food chain. *GLEWS+* will also be linked to the joint OIE/FAO Network of Expertise on Animal Influenza (OFFLU)³, to support international efforts to monitor the emergence and the control of animal influenza viruses.

The success of *GLEWS+* will depend on the capacity of national, regional and global health systems and networks to carry out indicator- and event-based surveillance that links the public health, veterinary, food safety and other sectors. FAO, OIE and WHO are actively supporting countries in building capacity to detect and report events at the human-animal-ecosystems interface, and to investigate and respond rapidly to outbreaks. They are also advocating for transparency for disease or events reporting among countries, in accordance with the OIE *Terrestrial and Aquatic Animal Health Codes*⁴, the WHO International Health Regulations (IHR 2005)⁵, and the FAO/WHO Codex Alimentarius Commission guidelines⁶.

2 The International Food Safety Authorities Network: www.who.int/foodsafety/fs_management/infosan/en/

3 OIE-FAO Network of Expertise on Animal Influenza: www.offlu.net.

4 OIE Terrestrial and Aquatic Animal Health Codes: www.oie.int/international-standard-setting/overview/

5 International Health Regulations (2005): www.who.int/ihr/en/

6 FAO/WHO Codex guidelines: www.codexalimentarius.org/

PURPOSE AND OBJECTIVES OF *GLEWS+*

THE PURPOSE OF *GLEWS+*

The ultimate goal of *GLEWS+* is to inform prevention and control measures, through the rapid detection and risk assessment of health threats and events of potential concern at the human-animal-ecosystems interface. This goal is critical to attaining the vision of FAO, OIE and WHO of *‘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’*.

OBJECTIVES OF *GLEWS+*

The objectives of *GLEWS+* are to:

1. improve detection of health threats and events of potential concern at the human-animal-ecosystems interface;
2. undertake joint risk assessments to inform rapid action on all acute health events of potential international concern at the human-animal-ecosystems interface, that would benefit from the organizations working together;
3. monitor disease events to assist prediction of changes in endemic or seasonal diseases and associated drivers to inform prevention and preparedness activities for health events at the human-animal-ecosystems interface;
4. ensure timely, coordinated and relevant risk communication about high-impact health events of potential concern at the human-animal-ecosystems interface:
 - within and between the three organizations,
 - contribute to tripartite or organizational risk communication with Member countries, the public and the international community as necessary.

WHAT CONSTITUTES A *GLEWS+* ‘EVENT’?

A *GLEWS+* ‘event’ is a health event of potential international concern affecting domestic or wild animal populations, humans or the food chain. For food safety events that have an animal aspect, *GLEWS+* will link with INFOSAN.

GLEWS+ health events will be identified on the basis of the following criteria:

1. first occurrence or recurrence of an event:
 - a) unusual *phenomenon for the area or season*,
 - b) event associated with an unknown hazard,
 - c) new host or new vector able to transmit disease;
2. emerging threat with significant human or animal mortality or morbidity or with zoonotic potential;
3. potential for transboundary spread;
4. potential impact on international travel or trade.

In addition, data on newly identified pathogens in domestic and wild animal populations will be monitored to follow trends and changes in pathogenicity, which may indicate changing risks to human and animal health.

Health threats monitored by *GLEWS+* include pathogens with high impact – including those that are zoonotic, have jumped species barriers, are of increased virulence or have invaded new geographical areas – and food hazards that threaten the food chain and international trade.

As *GLEWS+* is intended to complement existing systems, health events will be identified and prioritized through the event-based surveillance systems of the three organizations, with each organization being responsible for the quality of their respective data and initial triage criteria. Linking early warning under *GLEWS+* with results of joint risk assessments will respond to requests from stakeholders and priorities identified by countries.

CORE ELEMENTS OF THE *GLEWS+* OBJECTIVES

Objective 1. Improve detection of health threats and events of potential concern at the human–animal–ecosystems interface

GLEWS+ will take advantage of the complementary, respective event verification processes of FAO, OIE and WHO, and provide a framework for the rapid sharing of information and expertise. Outbreaks of disease in animals can provide direct early warning of a need to increase public health surveillance; conversely, public health surveillance could trigger investigations in animals. *GLEWS+* will provide interconnectivity between networks, recognizing the interdependence of the various sectors involved at the human-animal-ecosystems interface.

Legal and regulatory frameworks provided by WHO (International Health Regulations; IHR, 2005) and OIE (*Terrestrial and Aquatic Animal Health Codes*, World Animal Health Information System [WAHIS] and the Performance of Veterinary Services [PVS] Pathway) support early detection and notification of events, including emerging events, at the human-animal-ecosystem interface. Information assembled within *GLEWS+* provides a more complete and appropriate epidemiological context.

Objective 2. Undertake joint risk assessments to inform rapid action on all acute health events of potential international concern at the human-animal-ecosystems interface that would benefit from the organizations working together

GLEWS+ will allow systematic, defensible and timely joint risk assessments that:

- are based on comprehensive data sets housed in the three organizations, as well as on other available complementary data;
- involve multidisciplinary expertise;
- provide appropriate, coherent advice for response actions;
- facilitate and encourage coordinated responses from the relevant stakeholders;
- guide effective risk management and communication.

Risk assessment is a systematic process for gathering, assessing and documenting information, in order to assign a level of risk to an event. While FAO, OIE and WHO use slightly different methodologies to perform risk assessments, they have the same purpose and end-point: to provide the basis for integrated and coordinated action to manage and reduce the negative consequences of public health risks at the human-animal-ecosystems interface, by identifying key prevention and mitigation measures, and to ensure rapid dissemination of information.

WHO, OIE and FAO maintain independent information systems that could potentially be used to generate an assessment of the zoonotic diseases most likely to be transmitted to people via contact with livestock and animal products, food or exposure to wildlife, vectors or the environment. The organizations currently maintain their data in different information technology platforms, and the information itself varies in detail and content. Further, the rationale behind the data collection may be different for the different partners, as a result of differences in mandate and organizational activities.

The added value of interconnectivity and joint assessment is therefore high. Combining the data from the three organizations using good practices of organizational systems will allow the datasets to be put to better use in building risk assessments. Information sources include the legal and regulatory frameworks and notification tools of WHO's International Health Regulations, Event Management System (EMS)⁷ and Global Health Observatory Data Repository⁸, OIE's standards and World Animal Health Information Database (WAHID)⁹, FAO's EMPRES-i (Global Animal Disease Information System)¹⁰ and Gridded Livestock of the World¹¹. Other sources include PROMED/Health Map¹², and Wildlife Health Event Reporter and Health Map¹³.

Standard operating procedures will be needed to determine which events are to be assessed, and how the *GLEWS+* RA will fit within the context of existing processes of the individual agencies in line with the priorities of the three organizations and in response to risk management needs.

Objective 3. Monitor disease events to assist prediction of changes in endemic or seasonal diseases and associated drivers to inform prevention and preparedness activities for health events at the human–animal–ecosystems interface

GLEWS+ is uniquely positioned to support of prevention, forecasting and preparedness, especially for endemic, recurring and seasonal risks. The identification of at-risk areas or populations can help engage key policy-makers and operational partners before an event occurs or in its early stages. The pooling of data and expertise across the three organizations is therefore a critical component of *GLEWS+*, allowing more effective coordination of cross-sectoral action.

The strengthened joint risk assessment activities of *GLEWS+*, supplemented with relevant data on what is driving the emergence and persistence of diseases and health threats, will help build a more complete body of evidence. This in turn will lead to improved understanding of the global trends and epidemiology of diseases, reinforce preventive and forecasting capacities, and ultimately aid prevention, control and effective management of these disease risks.

7 <http://www.who.int/csr/alertresponse/en/>

8 <http://apps.who.int/ghodata/>

9 http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home

10 <http://empres-i.fao.org/eipws3g/#h=0>

11 <http://www.fao.org/AG/againfo/resources/en/glw/home.html>

12 <http://healthmap.org/promed/>

13 <http://www.whmn.org/wher/>

Objective 4. Ensure timely, coordinated and relevant risk communication about high-impact health events of potential concern at the human-animal-ecosystems interface

a) Within and between the three organizations

GLEWS+ would be the conduit and repository of information for health risks at the interface that will support decision making, action and communication within the organizations. Global and regional early warning is a core output of *GLEWS+*. The system should guide FAO, OIE and WHO in providing guidance on real and perceived risks at the human-animal-ecosystems interface. On the basis of the outputs of *GLEWS+*, messages on risk assessment and options for risk management can be constructed for Member States and the wider public. *GLEWS+* would aid in guiding response to health events through the mechanisms of the organizations and if needed through a joint response.

b) Contribute to tripartite or organizational risk communication with Member countries, the public and the international community as necessary

Improving two way communication between *GLEWS+*, regional and national representations will enhance the sensitivity of event detection and provide evidence in support of appropriate risk management. Strengthening the *GLEWS+* network with more integrated regional and country input will also improve the quality of data collected from the field, bring local context to support risk assessments, and improve the capacity of *GLEWS+* for real-time verification of events. Member States will benefit from the early warning and risk assessment outputs of *GLEWS*.

The websites of *GLEWS+*, WHO, OIE and FAO and regular publications are the portals for communicating information and simplified messages from joint risk assessments and evidence-based best practices for the management of health threats at the human-animal-ecosystems interface.

GLEWS+ TOOLS

A secure information platform hosted by FAO is currently used for tracking GLEWS disease events. This repository would require added functionality, so that large amounts of documentation can be stored and easily retrieved, and different data sets from various sources can be linked to support *GLEWS+* activities.

Designated staff in WHO, OIE, FAO and their regional representations will have access to the *GLEWS+* platform and will be able to enter data, request and provide analysis and expertise, contextualize information, contribute to risk assessments and participate in disease intelligence and early warning activities.

The GLEWS website (www.glews.net) has garnered a steadily increasing audience and is an important source of tripartite information on health threats at the human-animal-ecosystems interface. Relevant information on emerging issues and 'One Health' concept¹⁴ implementation is posted regularly. This portal will also allow users to access data on animal and human health events that include food- and wildlife-related components.

GLEWS+ TERMS OF REFERENCE

GLEWS+ MANAGEMENT COMMITTEE

The *GLEWS+* Management Committee (GMC) is composed of the Director-General or an Assistant Director-General from each organization, or their nominees, and is responsible for providing strategic direction and oversight of *GLEWS+* implementation. The GMC approves any proposed strategic changes and workplans of *GLEWS+*. The GMC meets at least once a year.

¹⁴ www.who.int/entity/influenza/human_animal_interface/HLTM_human_animal_ecosystems_nov_2011.pdf

GLEWS+ TASK FORCE

The *GLEWS+* Task Force (GTF) is comprised of designated *GLEWS+* focal points from each of the three organizations and their regional entities. These focal points provide the link to the respective early warning and response systems of the organizations. The GTF is responsible for implementing *GLEWS+* and workplans after approval by the GMC. The GTF guides and manages the *GLEWS+* Working Groups.

GLEWS+ WORKING GROUPS

The *GLEWS+* working groups are comprised of staff of the three organizations and external technical experts. This allows *GLEWS+* to benefit from a wide network of expert resources from WHO, OIE, FAO and their collaborating centres and external technical experts. Under the guidance of the GTF, *GLEWS+* working groups advise on the development of priority areas of the *GLEWS+* workplan. Working groups could also be set up on an ad hoc basis to answer emerging scientific questions and provide guidance on surveillance, risk assessment and management.

Current priority themes for consideration in working groups are: joint risk assessment; wildlife health; food safety; and understanding the drivers of disease and the impact of climate change on health threats.

A *GLEWS+* guidance working group comprised of key international stakeholders would provide suggestions and options to the GMC and the GTF on planned work allowing external partners to participate.

EVALUATION AND MONITORING FRAMEWORK

A framework for evaluation and monitoring, based on measurable process and outcome indicators, will be developed.



CONCLUSION

WHO, OIE and FAO are the international organizations responsible at global level for the health of people and animals and for food safety and food security. By working together, they have an opportunity to detect and assess risks of health events of potential international concern at the human-animal-ecosystems interface, including wildlife, in order to inform prevention and control measures. By pooling their expertise, data, and functional global networks and systems, the three organizations have an opportunity to develop a unique cross-sectoral mechanism to conduct robust and timely joint risk assessments. This will help ensure efficient, coordinated and relevant risk communication about health events of potential international concern at the human-animal-ecosystems interface, within and between the three organizations, with Member States, and with the public.

The global community is systematically building cross-sectoral partnerships, based on the comparative advantages of the partners, to increase efficiency and to ensure that action is based on the best available evidence. In this context, *GLEWS+* will provide a framework for addressing health threats and emerging risks at the human-animal-ecosystems interface.

TABLE 1

Definitions of terms used in this document

Emerging disease. A new infection resulting from the evolution or change of an existing pathogenic agent, a known infection spreading to a new geographical area or population, or a previously unrecognized pathogenic agent or disease diagnosed for the first time and which has a significant impact on animal or public health.
Event-based surveillance. The rapid collection of ad hoc information about acute public health events. Event-based surveillance uses a variety of official and unofficial information sources to detect clusters of cases with similar clinical signs and symptoms that may not match the presentation of readily identifiable diseases. Official sources include national authorities and other agencies, such as the United Nations system. Unofficial sources include media reports, other unofficial public information (e.g. internet sites), and reports from the public.
Event. A manifestation of disease or an occurrence that creates a potential for disease..
Hazard. A biological, chemical or physical agent in, or a condition of, an animal or animal product with the potential to cause an adverse health effect.
Indicator-based surveillance. Routine collection of predefined information about diseases using case definitions. Predetermined outbreak thresholds are often set for alert and response.
Health risk. A likelihood of an event that may adversely affect the health of human or animal populations, with an emphasis on one that may spread internationally or present a serious and direct danger.
Preparedness. The capability of the public and animal health systems, communities, and individuals to prevent, protect against, quickly respond to, and recover from emergencies.
Risk. The likelihood of an occurrence and the likely magnitude of the biological and economic consequences of an adverse event or effect on animal or human health.
Risk assessment. A structured process for determining the risk associated with a biological, chemical or physical hazard. Its objective is to characterize the nature and likelihood of harm resulting from human or animal exposure to the hazard.
Risk communication. An interactive process of exchange of information and opinion on risk among risk assessors, risk managers and other interested parties.
Surveillance. The systematic ongoing collection, collation and analysis of data for public health and animal health purposes, and the timely dissemination of information for assessment and response as necessary.
Verification. Actions undertaken to validate the accuracy of data received.
Zoonosis. Any disease or infection that is naturally transmissible from animals to humans.

