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Disease occurrence tracking: strategic response to TADs and informed decision-making

Executive summary

- Outbreaks of transboundary animal diseases (TADs), such as highly pathogenic avian influenza (HPAI), African swine fever (ASF), peste des petits ruminants (PPR), lumpy skin disease (LSD) and others, over the last ten years, have caused epidemic emergencies in Europe and Central Asia despite investment in prevention, biosecurity and control measures, diagnostics and improved surveillance.
- Modern technologies, such as whole genome sequencing, improved vaccines and diagnostics, modelling outbreaks and mapping risk factors, are available but are rarely linked to policy development or risk management decisions.
- A regional approach to TADs and risk assessment/prioritization is an absolute requirement and needs to be promoted through access to shared resources, training, common strategies using new technologies (e.g. mobile phones) and aimed at all sectors, including smallholders, farmers, private veterinarians and the public.
- FAO brings multidisciplinary expertise (from animal health surveillance, disease intelligence and risk assessment, risk management, crisis management and preparedness tools) that is needed to address these cross-sectoral issues.

Guidance sought

The ECA is invited to:

- Endorse the policy recommendations for members as outlined in paragraph 16
- Endorse the policy recommendations to FAO as outlined in paragraph 17

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I. Introduction

1. Increasing globalization and demand for agricultural products can facilitate the introduction and spread of TADs (Cartin-Rojas, 2012). Global public health emergencies, such as avian influenza, Ebola virus, Middle East respiratory syndrome coronavirus (MERS-CoV) have highlighted the importance of working across regions, agencies and governments to address these growing threats.

2. TADs can be of concern to socio-economic factors: livelihoods of farmers, consumers and communities as well as public health, especially in rural areas of the Europe and Central Asia region. IAEA (2012) also pointed out that "the livestock sector plays a major role for the economy of some Eastern European and Central Asian countries". The region is also rich in wildlife, including ungulates that often carry infectious diseases and, in the course of their migration, often come into contact with local livestock, or the presence of wild boar, which are ubiquitous throughout Eurasia (Bosch, et al., 2016).

3. Europe and Central Asian countries are continuously confronted with emerging transboundary animal diseases like lumpy skin disease (LSD), African swine fever (ASF), peste des petits ruminants (PPR) from neighbouring continents/regions where TADs are endemic.

4. Data and health information systems and tools are essential to understand and tackle TADs but require regional cooperation. Such information systems, with the right level of support, can also be used to track, manage and analyse data and forecast outbreaks, providing an early warning system for livestock producers and decision makers.

Figure 1. Avian influenza cases in the European and Asian region between 2014 and 2017



Figure 2. African swine fever cases in the European and Asian region between 2007 and 2017



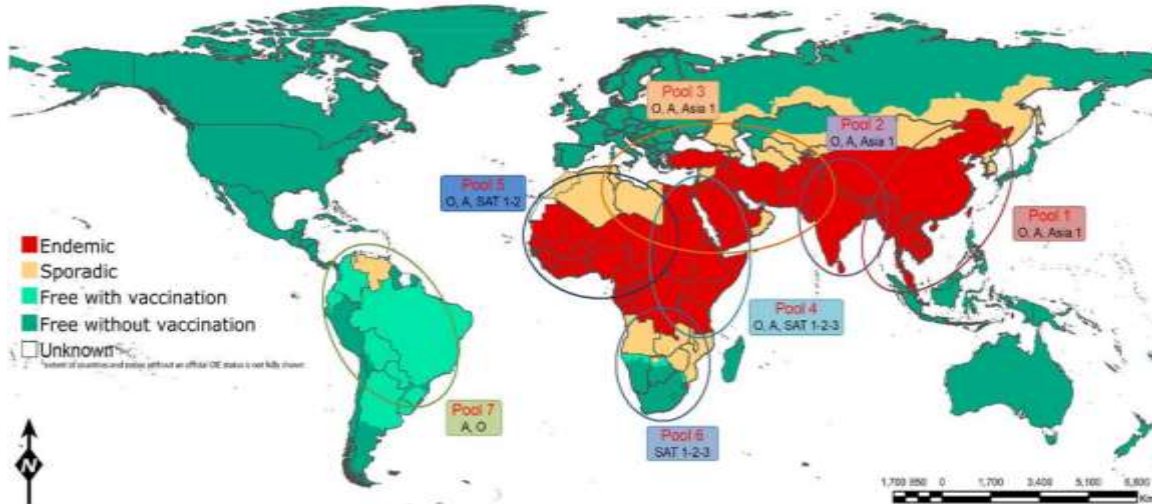
Figure 3. Lumpy skin disease cases in the European and Asian region between 2010 and 2017



5. The risk of further spread of LSD is particularly high, in south Eastern Europe (Albania, Montenegro, Serbia, FYR Macedonia). Countries in the Caucasus, Kazakhstan, Russian Federation and Bulgaria, as well as countries in south Eastern Europe and Central Asia are likely to face emergence or re-emergence of the disease. The risk of ASF incursion in EU and non-EU Eastern European countries is still relatively high and it is forecasted that more ASF outbreaks are likely to occur in Central and Eastern Europe in the months and years to come. In addition, incursions of TADs

such as peste des petits ruminants (PPR), new strains of foot-and-mouth disease (FMD - serotypes O and A) and a new strain of highly pathogenic avian influenza (H5N8 HPAI) can also emerge or seasonally increase their activity in some countries of the REU region (see Figures 4 and 5).

Figure 4. Global FMD status, as of 2017



Source: King (2017).

Figure 5. Outbreaks of the recently identified strain of H5N8 HPAI (clade 2.3.4.4) in Europe, Asia and Africa (wild birds, captive birds and poultry) against poultry density



Source: FAO's Global Animal Disease Information System (EMPRES-i), <http://empres-i.fao.org/eipws3g/>.

6. In this context, it is of crucial importance to intensify member countries' efforts for the prevention of emerging TADs in the Europe and Central Asia region. As one of the countermeasures greatly contributing to tackling and preventing TADs, the FAO Emergency Prevention System

(EMPRES)¹ and GLEWS provides information, early warning, risk assessment and epidemiology training and emergency assistance to control TADs and carries out surveillance for new and emerging diseases in regional and global contexts. For example, in 2017, FAO worked with Belarus, Ukraine and Moldova on tackling ASF by revising the existing regulatory framework and organizing a desktop simulation of an outbreak, resulting in a series of online decision support and information tools for farmers, veterinarians, hunters, and others involved in the pig sector (FAO, 2016b).²

7. Timely and reliable data sharing from farm to international level is paramount to developing a strategic response. Current tools include the European Commission Animal Disease Notification System (ADNS), which is limited to a list of notifiable diseases required for trade purposes; the OIE (WAHIS) system, which has a far wider list of pathogens, but is only used by those countries interested in trade in certain commodities; and the FAO (EMPRES-i) system, which relies on OIE data, national veterinary services and FAO country office data. Advances in information technologies make it possible to design more user-friendly and interactive, geographically aware and interoperable systems capable of providing a richer epidemiological context for disease observations.

8. The Global Early Warning System (GLEWS) became one of the mechanisms used by 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 provide support to member countries for detecting, preventing and controlling threats to health and the food chain. The GLEWS team in FAO embodies a cross-sectoral and multidisciplinary collaborative tool in addressing and assessing health risks at the human-animal-ecosystems interface.

9. A strategic response to a TAD outbreak relies on other epidemiological information such as host population data, husbandry, value chains and production systems, vector distribution and environmental factors among other risk factors. There is no common international standard for how or what data are collected or shared. This means any common approach to disease modelling or risk assessment needs to address these issues.

10. Nevertheless, new information technologies based on web- or cloud-based platforms and mobile phone apps for sharing data, disseminating epidemiological knowledge and risk assessment products, social media for sharing experience and expertise, should be utilized now that they are becoming more freely available.

Barriers and evidence gaps

11. Mechanisms need to be put in place to create participatory surveillance approaches which ensure that end users, such as farmers, receive useful information from research and early warning systems.

12. Regional cooperation needs to be improved for sharing data and information on animal diseases. Agreements need to be reached on definitions and standards and appropriate identification and registration of livestock and livestock holdings needs to be undertaken. A regional reference centre should be established as well as the creation of robust epidemiology networks which have strong stakeholder support.

¹ The Emergency Prevention System (EMPRES) is an FAO programme founded in 1994, with the goal of enhancing world food security, fighting transboundary animal and plant pests and diseases and reducing the adverse impact of food safety threats. EMPRES-Animal Health is the component dealing with the prevention and control of transboundary animal diseases (TADs).

² For additional information also see: www.asf.vet.ua; www.asf-md.info; <https://sites.google.com/site/bystopasf/population/pigfarms>; <https://sites.google.com/site/uastopasf/home>

13. Risk modelling and forecasting tools for emerging diseases, which can also determine regional variations in disease impacts, need to be developed.

FAO REU's role

14. Globally the Europe and Central Asia region contributes to the joint FAO-OIE-WHO Global Early Warning System (GLEWS+) and the FAO Emergency Prevention System (EMPRES)-Animal Health³ through data provision and ensuring timely communication between sectors responsible for human health, animal health, wildlife, and food safety. With regard to EMPRES, FAO Regional Office for Europe and Central Asia (REU) also contributes to the development of strategies for the intervention and improved management of TADs.

15. Within the Europe and Central Asia region disease tracking and risk assessment are predominately undertaken through project-based support. This includes capacity-building, technical guidance and the establishment or improvement of national online decision support and information tools for disease surveillance, sharing data and experience as well as the dissemination of information and data. Therefore, there is a need to advance and extend assistance to member countries in more systemic and comprehensive ways.

Recommendations for members

16. The ECA may wish to recommend that member countries actively participate in the following actions:

- 1) Invest in research and development of diagnostic tools and data-sharing platforms and encourage the regional community to invest in new medicines, diagnostic tools, vaccines, and alternative interventions.
- 2) Increase the involvement of the scientific research community on emerging animal health threats, epidemiology and host pathogen environment interactions into national and regional decision-making and responses to TADs.
- 3) Facilitate the establishment of a regional data mining centre to support development of high-tech disease management applications focused on risk modelling, early warning, early response and provision of contextualized information and knowledge on infectious diseases of animals and humans.

Recommendations for FAO REU

17. The ECA may wish to recommend that FAO REU and other organizations:

- 1) **Support** the development of regional networks and collaboration for data collection, risk assessment, diseases risk models, enhanced data sharing, early warning systems and emergency preparedness/response. This should include analysis of the interlinkages between climate change and environment, TADs, food security and other issues such as trade.
- 2) **Promote** regional mechanisms to manage outbreaks of TADs, through surveillance, early warning, detection and response that ensures coordination, communication and participation of all stakeholders.
- 3) The joint FAO-OIE-WHO Global Early Warning System (GLEWS+) should continue to **inform** prevention and control measures at global and regional levels through the rapid

³ <http://www.fao.org/ag/againfo/programmes/en/empres.html>

detection and risk assessment of health threats and events of potential concern at the human-animal-ecosystems' interface.

- 4) **Build** on the example of the European Commission for the control of foot-and-mouth disease (EuFMD) in developing regional approaches to surveillance, diagnosis and control of other emerging TADs.
- 5) **Promote** new technologies for sharing knowledge and developing expertise, including web-based platforms and mobile phone apps for disease surveillance and data sharing.

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