**What’s new in EMPRES-i?**

**The EMPRES-i genetic module: a new tool for linking epidemiological and genetic influenza information**

*Why develop the module?*

Combining surveillance, genetic characterization and geomapping for animal influenza viruses can contribute to a better understanding of virus evolution and the epidemiology of influenza. Adding information such as agro-ecological farming system characteristics can support risk modelling of influenza emergence and spread in animal populations and possible transmission to humans, by refining influenza high-risk areas and risk factors. Integration of viral characteristics into an animal disease database such as the Emergency Prevention System Global Animal Disease Information System (EMPRES-i) therefore provides a unique tool for improving knowledge of disease epidemiology and ecology. More broadly, this tool can constitute an influenza gene observatory, and has already been utilized as such (FAO, 2012) to support risk assessment of human–animal influenza threats. The interest in such influenza genetic modules has already been confirmed by scientists in both the human and the animal health sectors. The tool was endorsed by the World Organisation for Animal Health/Food and Agriculture Organization of the United Nations (OIE/FAO) network of expertise on Animal Influenza (OFFLU) in 2011.

*Designing the module*

EMPRES-i and OpenFluDB developed an interface to link the EMPRES-i outbreak data and influenza virus sequences. This interface ranks all suitable isolates against all outbreaks, and vice versa, according to the best combination of three criteria: geolocation, host species, and time of sampling/event. It provides an automatic score of 0 to 100 percent, indicating the confidence of each of the most possible proposed linkages. When possible, manual validation of the linkages between sequences and outbreaks is subsequently carried out on this interface.

*Application of the module*

The EMPRES-i genetic module benefits from existing tools present within EMPRES-i – for spatial mapping, export of information, and interfaces with other databases such as the Global Livestock Production and Health Atlas (GLIPHA) – and from the phylogenetic tools already developed by SIB. In particular, sequence similarity maps (SSMs) enable the identification of relative genetic distances for a large number of viruses. These maps can be used to study virus evolution and clusters, and may be combined with epidemiological information such as date, species and location.

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4 www.offlu.net.
5 A publicly available database on influenza, developed, curated and quality-checked by the Swiss Institute of Bioinformatics (SIB): http://openflu.vital-it.ch/browse.php
to create spatio-temporal maps of virus clades and clusters that can be overlaid by other layers such as animal density maps. The SSMs can also be used for screening of virus distribution according to geographical location, host and time, with molecular markers of interest, for identification of potential drivers of virus evolution and the occurrence of reassortment events, and for knowledge gap analysis of virus sequences. The epidemiological information present in OpenFluDB for individual isolates can be completed in cases of validated linkages, with hyperlinks to EMPRES-i individual outbreaks provided in OpenFluDB.

FAO is currently applying this module to data available in various H5N1-endemic countries. Efforts are being made to validate links between the highest possible proportion of available H5N1 virus sequences and the outbreaks present in the EMPRES-i disease tracking module, and links to the active surveillance events described in reports and scientific papers. An average of about 35 percent of the H5N1 isolates present in OpenFluDB are linked to outbreaks present in EMPRES-i.

Using and contributing to the module
FAO aimed to make this genetic module publicly available before the end of 2012. It is expected that scientists – both epidemiologists and virologists – and decision-makers will make use of this tool to map combined information and to perform (risk) analysis. It is also hoped that scientists and technicians will contribute to FAO’s efforts by suggesting new links between virus sequences and outbreaks/discoveries during active surveillance. An interactive system will be put in place for these contributions. In parallel, FAO has initiated efforts at the country level, so that the linkages between sequences and outbreaks are not lost; the four-way linking initiative at the human–animal interface represents one of these efforts (FAO, 2011).
interfaces with other influenza databases – such as EpiFlu™6 of the Global Initiative on Sharing All Influenza Data (GISAID) and the Influenza Research Database (IRD)7 – are also being explored and may provide additional information. Development of this module for other diseases is being considered, and has been initiated for foot-and-mouth disease.

Please visit the EMPRES-i website for further information.8

References


Contributors: Gwenaelle Dauphin (FAO), Filip Claes (FAO)

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6 http://platform.gisaid.org/epi3/frontend#62bc89
7 http://www.fludb.org
8 http://empres-i.fao.org/eipws3g/#h=0
EMPRES participates in new EU-funded projects

Risk-Based Animal Health Surveillance Systems (RISKSUR) “Kick-Off” Meeting, 1 to 2 November 2012

The RISKSUR Kick-Off Meeting was organized jointly by the Royal Veterinary College (RVC) and accelopment AG (ACCEL) and held on the RVC Hawkshead Campus, Hatfield, United Kingdom of Great Britain and Northern Ireland.

The RISKSUR project is a consortium of 12 partner institutions, including the Food and Agriculture Organization of the United Nations (FAO). It is funded by the Seventh Framework Programme (FP7) of the European Union (EU) for the funding of research and technological development in Europe. The project aims to develop decision support tools for the design of cost-effective, risk-based surveillance systems that integrate the most recent advances in epidemiological methodologies, are based on an interdisciplinary approach and are tailored to the needs of individual EU Member States. This aim will be achieved through the development of evaluation frameworks for animal health surveillance system designed for three surveillance objectives regarding livestock diseases:

1. early detection of exotic, new (emerging) and re-emerging diseases;
2. demonstration of freedom from diseases and infections;
3. determination of disease frequency and detection of cases of endemic animal diseases.

The methodologies will be applied to diseases representing key risk scenarios within EU member countries and selected countries outside the EU with particularly challenging system constraints, such as inadequate veterinary infrastructure.

The overall duration of the project is 36 months, the total budget is €3.8 million and the project work plan is divided into eight work packages (WPs). WP 1 will develop a conceptual generic framework for designing risk-based surveillance systems, including the novel scientific methods that will be developed for each of the three surveillance objectives in WPs 2 to 4. In WP 5 the results of WPs 1 to 4 will be evaluated by assessing the efficiency of the single and multi-objective surveillance systems developed. Transfer of knowledge and technology to stakeholders in policy and industry will be facilitated through the development of tools for implementing the systems, in WP 6, and through communication and training in WP 7. WP 8 will cover overall project coordination and management.

FAO will contribute to WPs 5, 6 and 7.

Contributors: Julio Pinto (FAO), Vincent Martin (FAO)

ASFORCE “Kick-Off” Meeting, Lisbon, Portugal, 22 to 23 October 2012

ASFORCE is a European consortium funded under the European Union’ (EU’s) Seventh Framework Programme (FP7) for “Targeted Research Effort on African Swine Fever” (ASF), with 18 partners. The ASFORCE Kick-Off Meeting took place in Lisbon,
Portugal on 22 and 23 October. Its objectives were: i) general discussion of the project; ii) finalization of a work plan and collaboration procedures for partners; and iii) agreement on the implementation of necessary tasks – the “who, when, where and how?”. Following the spread of ASF throughout Africa, the Caucasus and the Russian Federation, Europe is at high risk of disease introduction via legal or illegal movements of animals and animal products, particularly through its eastern borders. Research efforts across Europe should therefore continue to provide the science for preparedness in this evolving situation.

The ASFORCE project will last for 36 months and its work plan covers five major themes, corresponding to its objectives, which are divided into 19 work packages of tasks.

The five themes are:
1. project coordination and management;
2. ASF prevention, control and eradication models;
3. pig–wild boar–Argasidae interactions relevant to ASF epidemiology;
4. development of tools for protecting against ASF (vaccines and improved diagnostic tests);
5. training and knowledge transfer.

The Food and Agriculture Organization of the United Nations Emergency Prevention System (FAO EMPRES) participates in themes 2, 3 and 5, mainly through the implementation of field activities in Eastern Europe and the Caucasus.

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Publications

FAO Animal Production and Health publications
FAO Animal Production and Health Proceedings No. 15: Lessons learned from the eradication of rinderpest for controlling other transboundary animal diseases
IN MEMORIAM: Dr Boubacar M’Baye Seck, Coordinator FAO-ECTAD Bamako (Mali)

A baobab has fallen, a library has burned, Dr Boubacar M’Baye Seck has left us. He was for all of us who knew him in Mali, in Africa and around the world the incarnation of humility, humanity, dedication, competence, rigour and professional excellence, but also of a sense of humour and joie de vivre. He will remain a model for many of us.

On the morning of Thursday 16 August 2012, Dr Seck died with dignity and in family privacy in Bamako, without much noise, in the image of what his life had been. It would be pretentious to summarize his life in a few lines.

A graduate of the Veterinary School of Maisons-Alfort, France and the Institut Pasteur, he devoted his professional life to animal health in Mali and Africa. On his return from training in France he joined the Central Veterinary Laboratory in Bamako, of which he became the Director General and which he raised to the rank of prestigious laboratory in the region. He played a central role in the establishment and development of the Pan African Veterinary Vaccine Centre (PANVAC); from August 1996 to July 2000 he was recruited by the Food and Agriculture Organization of the United Nations (FAO) as Expert Chief Technical Advisor to PANVAC, based in Debre Zeit, Ethiopia. He returned as Director of the centre from February 2004 to November 2005, under a technical assistance contract between the African Union Interafrican Bureau for Animal Resources (AU-IBAR) and the International Cooperation Centre of Agricultural Research for Development’s Department of Animal Production and Veterinary Medicine (CIRAD-EMVT). In January 2006, FAO recruited him as Project Coordinator of Technical Cooperation Programme project TCP/RAF/3016, the keystone of FAO support to the control of avian influenza in West and Central Africa. This project laid the groundwork for creation of FAO’s Emergency Centre for Transboundary Animal Disease Operations (ECTAD) Unit in Bamako in 2006. Subsequently, he acted as Laboratory Expert in the same unit, before becoming its Coordinator in July 2010. Through his valuable advice and numerous technical support missions, he has contributed immensely to strengthening the capacities of veterinary services and diagnostic laboratories in the region.

This man, this great man, this monument has left us, leaving behind him
inconsolable family members, relatives, friends and colleagues. To summarize this exceptional man, we say that Dr Seck lived fully and effectively. Since the announcement of his death, waves of sympathy and initiatives to honour his memory have flowed in from Mali, Africa and around the world, including the decoration as Knight of the Order of Mali National Merit awarded by the State of Mali posthumously, providing tangible proof of the esteem and consideration that we all feel for him. A page has turned, but we are confident that Dr Seck continues to remain in all of us. May we have the strength to continue his work and take inspiration from the legacy he has left us. This is the only tribute that we can pay to him that comes close to the dimensions of the man he was.

Dr Seck, Frère/Brother Boubacar, Tonton Seck, we miss you already.

Repose en paix et que la terre d’Afrique et du Mali, à laquelle tu as tant donné, te soit légère.