



OFFLU Annual Report 2017

In 2017, avian influenza (AI) outbreaks continued to threaten both animal health and public health worldwide. More than 60 countries of the Asian, African, European, Middle Eastern and American Regions experienced highly pathogenic avian influenza (HPAI) outbreaks during 2017 and strains of HPAI virus subtypes H5N1, H5N2, H5N3, H5N5, H5N6, H5N8, H5N9, H7N1, H7N3 and H7N9 were encountered. A new development was the emergence in China in January 2017 of a variant of the H7N9 virus that is highly pathogenic in poultry. To January 2018 H7N9 HPAI was detected in 54 poultry or environmental samples and H7N9 virus isolates from 32 human cases during the period were found to be HPAI virus.

In response to these outbreaks, the OFFLU network experts participated in various teleconferences and meetings to share epidemiological and experimental data and diagnostic protocols that are needed to inform surveillance and control policies, and in building technical partnerships with Member Countries. OFFLU and WHO have been in regular communication to share public health and animal health data so that risk assessment can continually be updated and on issues related to the animal-human interface, including pandemic preparedness.

Contribution of avian influenza data for pandemic preparedness

Every six months OFFLU coordinates inputs from OIE/FAO Reference Centres and national veterinary laboratories to provide avian influenza virus data for consideration during the WHO Vaccine Composition Meeting (VCM). These data are needed to update pre-pandemic candidate vaccine viruses for human vaccines against zoonotic viruses of concern, and to contribute to the WHO biannual report of “Antigenic and genetic characteristics of zoonotic influenza viruses and development of candidate vaccine viruses for pandemic preparedness.”

In the February 2017 WHO VCM meeting, sequence data for 248 H5, H7, and H9 were contributed by OFFLU Animal Influenza Experts representing 32 animal health laboratories in 24 countries representing Europe, Asia, Africa, and the Americas. The contributed countries include Egypt, Morocco, Niger, Nigeria, Togo, Chile, USA, Bhutan, China, India, Japan, Korea, Laos, Myanmar, Taiwan, Vietnam, Austria, France, Germany, Italy, Netherlands, Romania, Russia and United Kingdom (UK). Antigenic data for H5 clades 2.3.4.4 and 2.3.2.1, and H7 Y280 lineage viruses were contributed by three of the

OIE/FAO reference laboratories (Istituto Zooprofilattico Sperimentale delle Venezie in Italy, Animal and Plant Health Agency in the UK and the Australian Animal Health Laboratory in the Australia). New data visualization tools such as Microreact <https://microreact.org/> were used in this session.

In the September 2017 meeting, a new record of submissions was achieved. Sequence data for 341 H5, H7, and H9 and antigenic data for 49 viruses were contributed to OFFLU by animal health laboratories in 36 countries representing Europe, Asia, Africa, and the Americas. New data visualization tools such as Antigenic Cartography <http://www.antigenic-cartography.org/> was introduced in this session.

The OFFLU VCM team would like to specifically acknowledge the involved OFFLU network laboratories and Member Countries for the significant contribution of HPAI genetic data for the year 2017.

http://www.who.int/influenza/resources/documents/characteristics_virus_vaccines/en/

OFFLU avian influenza virus characterization meeting

In March 2017, OFFLU organized an avian influenza virus characterization technical meeting at FAO Headquarters, Rome comprising experts from OIE-FAO Reference Centres for avian influenza, national veterinary laboratories and public health laboratories. The meeting served as a platform to discuss and promote sharing of genetic and antigenic data relating to avian influenza with the purpose of establishing a methodology for monitoring antigenic changes among the

circulating strains. The experts also discussed the production of chicken sera by OFFLU labs against the main circulating viruses. The ultimate goal of this activity is to provide possible scientific recommendations on poultry vaccine seed strains against circulating low and high pathogenicity avian influenza viruses.

<http://www.offlu.net/index.php?id=330>

OFFLU proficiency testing

OFFLU conducted the annual avian influenza (AI) molecular proficiency testing (PT). Ten OIE/FAO AI Reference Laboratories, the OIE Collaborating Centre for Research on Emerging Avian Diseases and the WHO Collaborating Center for Studies on the Ecology of Influenza in Animals were invited to participate. The round was coordinated by the Australian Animal Health Laboratory (AAHL) and conducted under their ISO 17043 accreditation. The panel comprised 15 inactivated (gamma irradiated), allantoic fluid samples to be tested for molecular detection of influenza A (IA), H5 and H7 viruses and for pathogenicity (cleavage site) analysis as appropriate. The panel viruses were derived from Australia or the Southeast/East Asian region and so gave many participants an opportunity to test for strains of AI not usually encountered.

Guidance on Influenza A cleavage sites

OFFLU experts updated a guidance document that provides information regarding amino acid sequences at the influenza A cleavage sites for assistance in differentiation of low pathogenicity and high pathogenicity AI viruses through molecular analyses, as described in the OIE *Terrestrial Animal Health Code*. This document included molecular sequences for multibasic cleavage sites of H5N1 HPAI viruses from Asia, Africa and Europe; previously reported multibasic cleavage sites of other HPAI viruses (H5 and H7); and a list of 2-3 residue multibasic cleavage sites. The document was updated

OFFLU Swine influenza virus group activities

The OFFLU swine influenza group met for the sixth annual technical meeting in March 2017 at the FAO Headquarters, Rome and shared data about the global swine influenza situation in pig populations by providing regional and country-specific reports from Australia, Japan, Thailand, Vietnam, South Korea, Europe, United States of America (USA), Canada, Brazil, Chile, Guatemala, Colombia, Argentina and Africa. Participants included scientists conducting influenza surveillance and/or performing influenza research or diagnosis in swine.

<http://www.offlu.net/index.php?id=360>

The OFFLU swine influenza group updated and distributed a guidance document 'Collection of Specimens from Swine for

Eight laboratories returned results in time for inclusion in the statistical analysis and reports have been sent to the participating laboratories.

OFFLU conducts these PT rounds in support of the designated reference laboratories to facilitate international harmonization of testing capability and to this end exposure to specimens from areas geographically different from the normal catchment is useful. The PT panel is designed to be challenging so as to allow laboratories the opportunity to fine tune their capability. Laboratories with results divergent from the expected will investigate the causes as required under their quality assurance system accreditation, and can be helped in this by requesting more specimen, if needed.

in January 2018 taking into account the HPAI outbreaks for the past year. Considering the importance of this information, the document has been referred to in the avian influenza chapter of the OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*.

http://www.offlu.net/fileadmin/home/en/resource-centre/pdf/Influenza_A_Cleavage_Sites.pdf

the Detection of Influenza A Virus by Molecular Assays or Virus Isolation'.

http://www.offlu.net/fileadmin/home/en/resource-centre/pdf/OFFLU-Collection_of_Specimens_for_Detection_of_Influenza_December2017.pdf

The swine influenza experts are currently reviewing the current status of the swine H3 nomenclature system and automated tool to develop a phylogeny-based global nomenclature system for H3 hemagglutinin genes. Some members of the group already developed and published a global nomenclature system for H1 HA genes.



Swine influenza group meeting participants, Rome, March 2017

Equine influenza update

Equine influenza (EI) is a respiratory disease of horses and has the potential to disrupt major equestrian events. EI can be controlled by vaccination but it has been demonstrated in the field that antigenic drift impacts vaccine efficacy. The Expert Surveillance Panel of EI comprising OFFLU and WHO influenza experts met at the OIE Headquarters in March 2017 and reviewed the EI virus activity, characteristics of the viruses isolated and vaccine performance. The panel studied the individual animal cases and outbreaks of equine influenza reported by Ireland, Sweden, UK and USA in the past year and recommended that vaccines for the international market should contain both clade 1 and clade 2 viruses of the Florida sublineage.

<http://www.oie.int/en/our-scientific-expertise/specific-information-and-recommendations/equine-influenza/>

An international project entitled “Validation study on real time RT-PCR diagnostic assay(s) for equine influenza in

horses” was completed in December 2017. This was funded by the OIE together with the International Federation for Equestrian Sports (FEI) and the International Federation of Horseracing Authorities (IFHA). Equine influenza is recognized as one of six OIE listed diseases at risk of dissemination as a result of international competition horse movements. Thus the availability of a standardised test of sufficient sensitivity to detect low quantities of virus shed by vaccinated High Health, High Performance (HHP) horses is considered paramount to safeguard not only the horses competing at an international event but also the population of the host country. A well-established RT-PCR assay was selected by the panel and its diagnostic performance was evaluated with over 1200 field samples from three continents. The validation report has been submitted to the OIE Biological Standards Commission for evaluation and inclusion in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals as suitable for the purpose of certifying freedom from infection in individual animals for trade or movement.



The expert surveillance panel of equine influenza, Paris, March 2017

OFFLU wildlife/wild bird influenza group

The experts from various continents involved in wildlife/wild bird influenza surveillance and research met by teleconferences on various occasions to share data and provided situation updates of outbreaks in wild birds and poultry and updated guidance document on the role of wild birds in the circulation of avian influenza viruses.

The group developed a concept note for a global surveillance program for avian influenza viruses in wild birds. The

overarching objective of this proposed global surveillance program for influenza viruses in wild birds is to cost-effectively and regularly monitor the changing characteristics of genomic diversity of influenza viruses and secure the benefits of such surveillance information equally for all countries through a single affordable program. The concept note was presented in the European Commission Chief Veterinary Office/Chief Medical Officer Meeting on Influenza Preparedness in the context of One Health.

OFFLU applied epidemiology technical working group meeting

OFFLU organised an inaugural technical meeting for the applied epidemiology technical working group at FAO Headquarters in June 2017 to finalise the Terms of Reference and to develop specific work plans for the group's activities. The experts will provide guidance and advice to stakeholders at sub-national, national, regional and global level in relation to avian influenza (AI) risk assessment and management. The scientific aims of this group are to contribute to the identification of the pathways leading to the introduction, spread and maintenance of relevant avian influenza viruses in different eco-social system settings and estimate the risks

associated with these pathways, within the context of structured risk assessments. The group will also develop appropriate risk management options for relevant avian influenza viruses in different eco-social system settings, including the design of surveillance systems and their components.

http://www.offlu.net/fileadmin/home/en/meeting-reports/pdf/Epi_Rome_2017/OFFLU_AETWG_TOR_Jan_2018.pdf

Liaison with other Organizations

In late 2016 and early 2017 OFFLU experts were involved in a WHO working group to update the WHO Public Health Research Agenda, specifically Stream 1: Reducing the Risk of Emergence of a Pandemic Influenza. The revised Agenda was published in December 2017. The OFFLU Committees will now evaluate whether there is information that should be incorporated into a revision of the OFFLU Global Animal Influenza Research Agenda, developed in 2014.

http://www.who.int/influenza/resources/research/publication_research_agenda_2017/en/

In December 2017 several experts from the OFFLU AI Reference Centres participated in an OIE ad hoc group to advise on proposed changes to the avian influenza chapter in the *Terrestrial Animal Health Code*. This is ongoing work. The reports of the ad hoc group meetings will be posted on the OIE website after consideration by the relevant Commissions.

Next OFFLU technical meeting in April 2018 at Brighton, UK

OFFLU is holding its next technical meeting on 18th April, 2018 at the Grand Hotel, Brighton, UK in conjunction with the 10th International symposium on Avian Influenza (ISAI) and the 4th International Symposium on Neglected Influenza Viruses. The objective of the meeting is to review the outcomes of the

ongoing technical activities, networking and plan future activities. The OFFLU meeting will take place after the conclusion of the 10th ISAI. To register for the OFFLU meeting please email secretariat@offlu.net.

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