Food and Agriculture Organization of the United Nations

World Organisation for Animal Health
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OFFLU Avian Influenza Matching (AIM) project

Dr Lorcan Carnegie (FAO, OFFLU Scientist)

4th Meeting of the Standing Group of Experts on Avian Influenza (SGE-AI) of GF-TADs for th

Overview

OFFLU Network

Poultry Vaccination

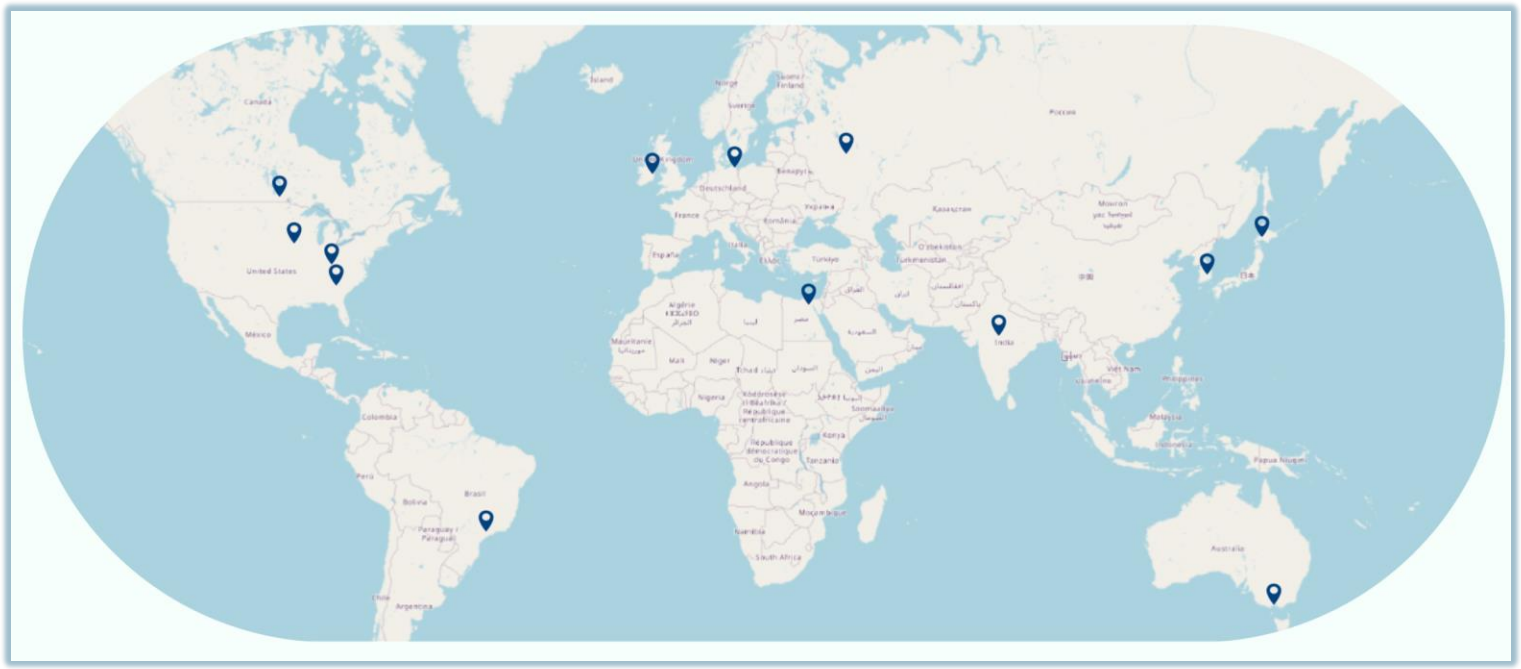
OFFLU AIM Project

Future Directions and Challenges

Conclusions

GF-TADs Global Avian Influenza Strategy (2024–2033)

The OFFLU Network



Joint WOAH-FAO network of expertise on animal influenza: reference labs and independent ex

To support global efforts to prevent, detect and control influenzas in animals

Food and Agriculture Organization of the United Nations

Vaccination against avian influenza viruses

Policy brief

Avian influenza vaccination: why it should not be a barrier to safe trade

Executive summary

Since 2005, avian influenza has had a staggering toll, with over 500 million birds lost to the disease worldwide [1]. Its devastating impact extends beyond domestic and wild birds, threatening livelihoods, food security and public health. The recent shift in the disease's ecology and epidemiology has heightened global concern as it has spread to new geographical regions. It has also caused unusual die-offs in wild birds and led to an alarming increase in mammalian cases. The rapidly evolving nature of avian influenza and **changes in its patterns of spread** [2] require a review of existing prevention and control strategies. To effectively contain the disease, protect the economic sustainability of the poultry sector and reduce potential pandemic risks, all available tools must be reconsidered – including vaccination.

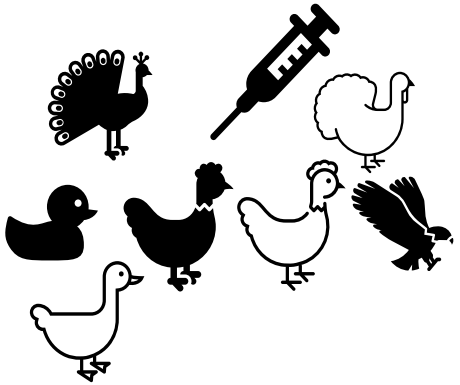
Vaccination in poultry against HPAI is used in several countries to protect livelihoods and reduce z

Preventative, emergency, routine & stamping out

Many other countries are currently considering vaccination as part of their avian influenza control

Vaccination against avian influenza viruses

Inactivated vaccines are widely used and cost-effective



What makes a good vaccine?

Ability to induce immunity

Ease of administration, availability and cost

Ability to differentiate between vaccinated and unvaccinated animals

Antigenic match of the seed strain to the viruses in the region

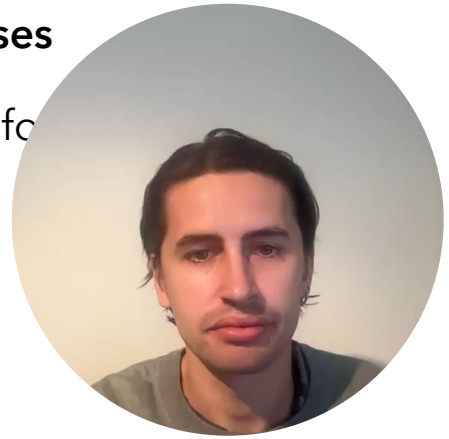
OFFLU Avian Influenza Matching (AIM) project

The AIM project provides antigenic data on circulating HPAI A(H5) avian influenza viruses

Facilitate the selection of appropriate vaccines for poultry and used in conjunction with other info

Launched in 2022 - Annual Reports, Guidance, Webinars

Outputs are freely available poultry sector, governments, and vaccine manufacturers



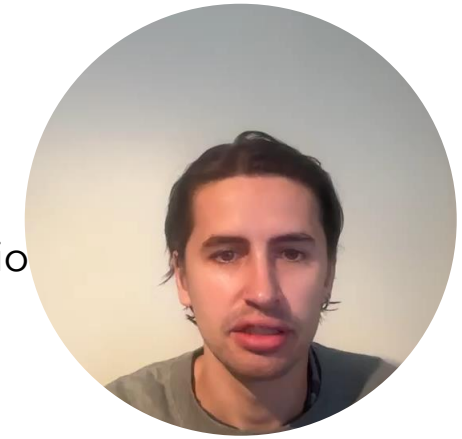
Why OFFLU?

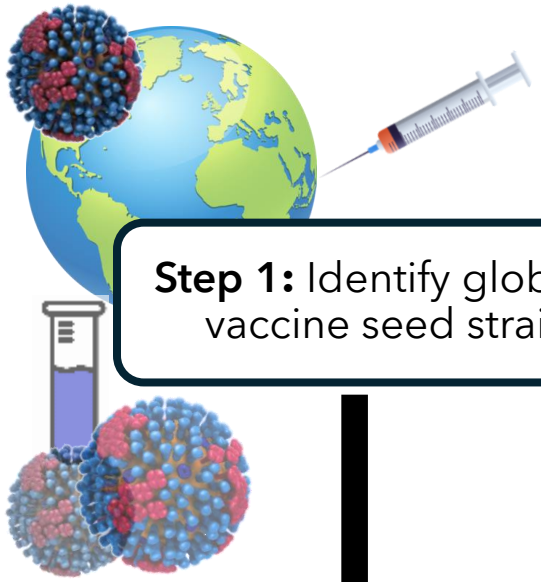
Independent research network & FAO and WOAH reference laboratories

Collate animal epidemiological information, sequences and isolates via network

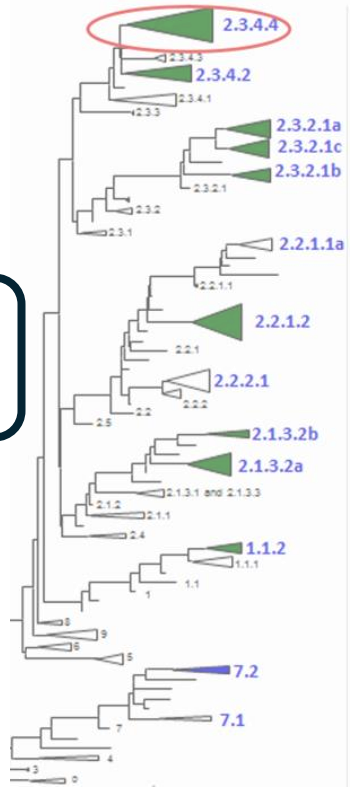
Technical expertise and analysis of data, including experience with WHO's Vaccine Compositio

Data confidentiality



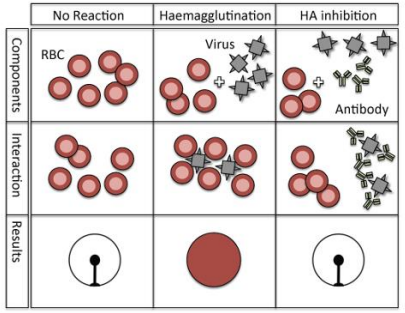


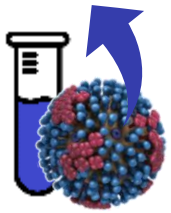
Step 1: Identify global H5 vaccine seed strains.

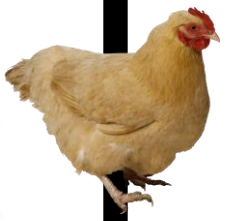


Step 2: Gather contemporary circulating strains and characterise the genetic diversity.

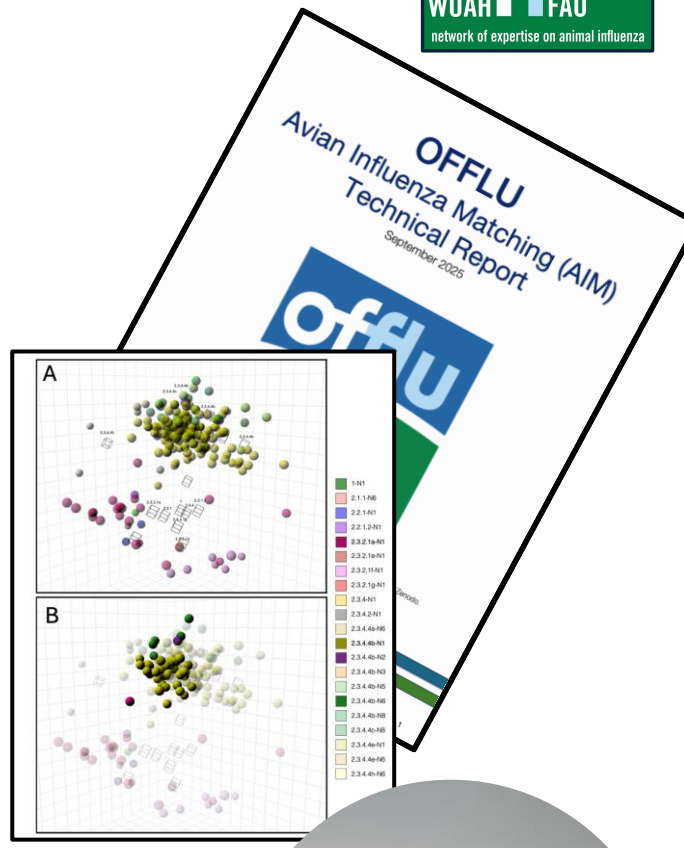
Step 3: Partner labs receive reference reagents and antigenically characterise new strains

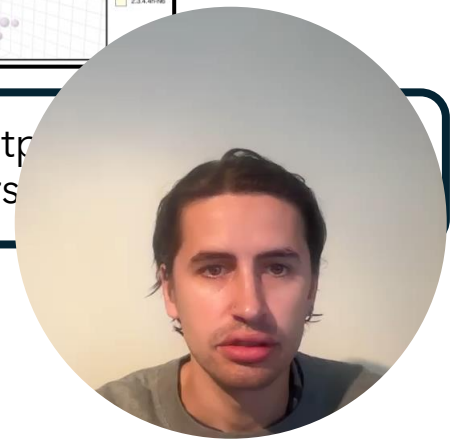




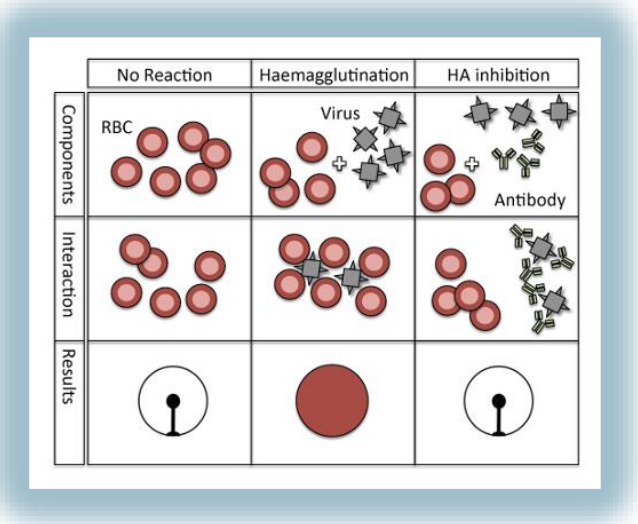


Step 4: Outp
stakeholders





Antigenic Testing



Haemagglutinin Inhibition (HI) assay

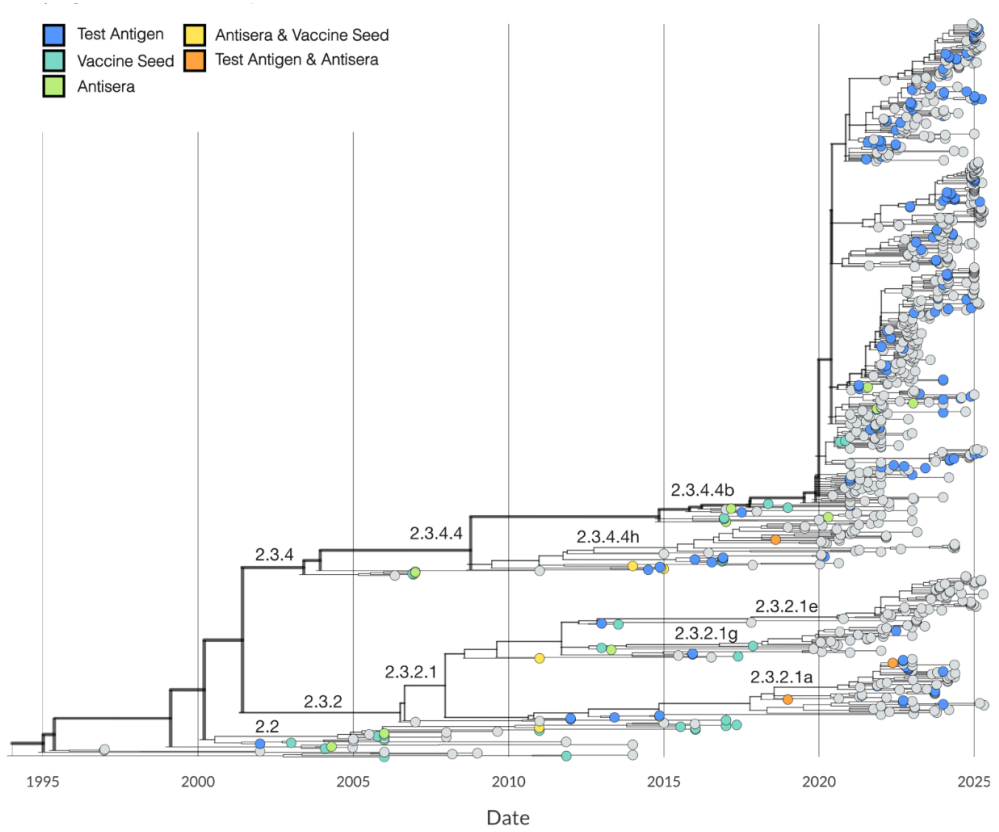
Measures how well antibodies recognise influenza viruses

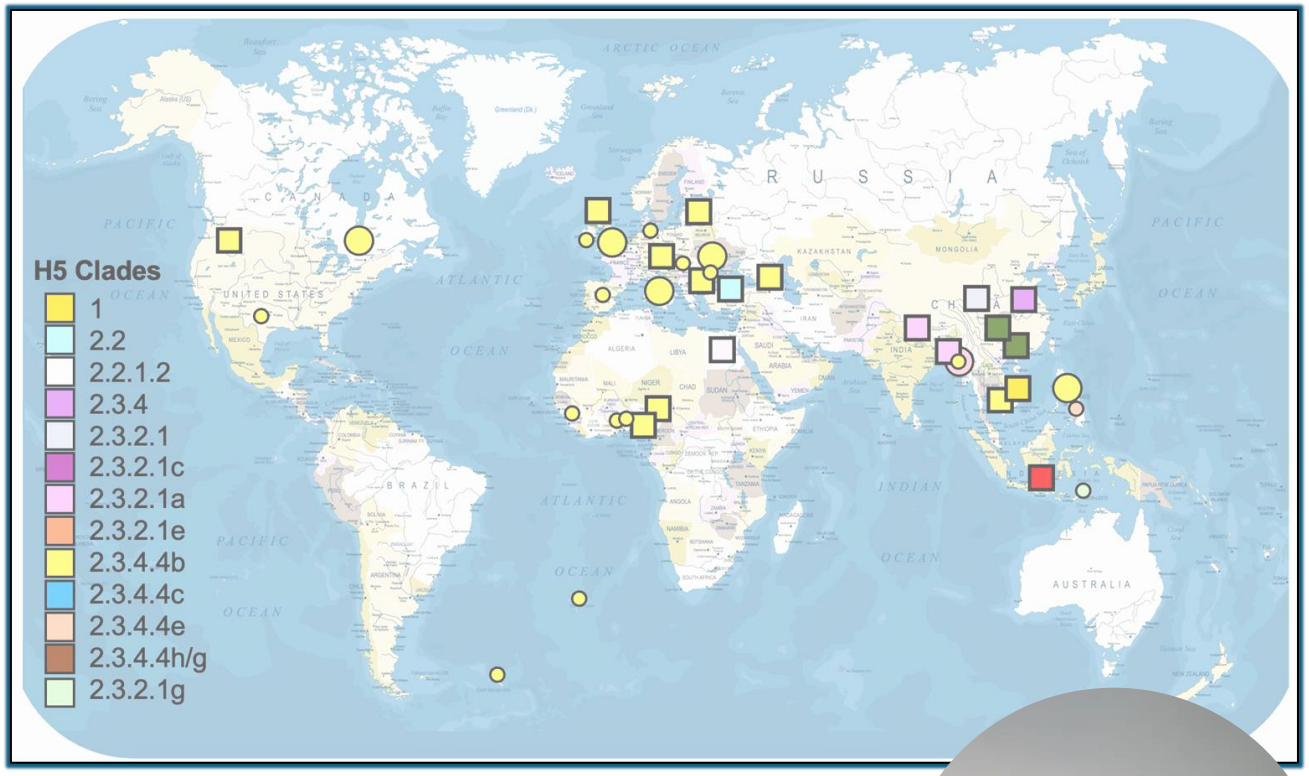
Provides an indication of antigenic similarity between viruses and vaccine strains

Harmonisation across laboratories allows integration of multiple datasets

IZSVe (Italy), APHA (United Kingdom), CSIRO ACDP (Australia), SERPL (United States)

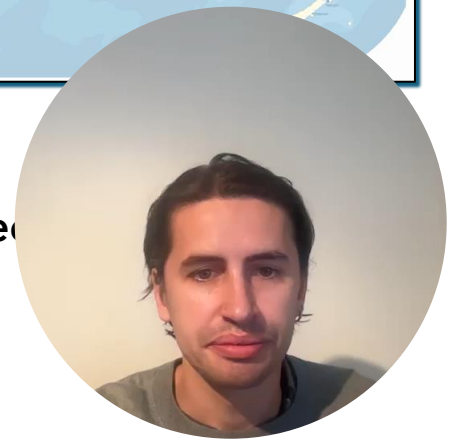
Testing to date



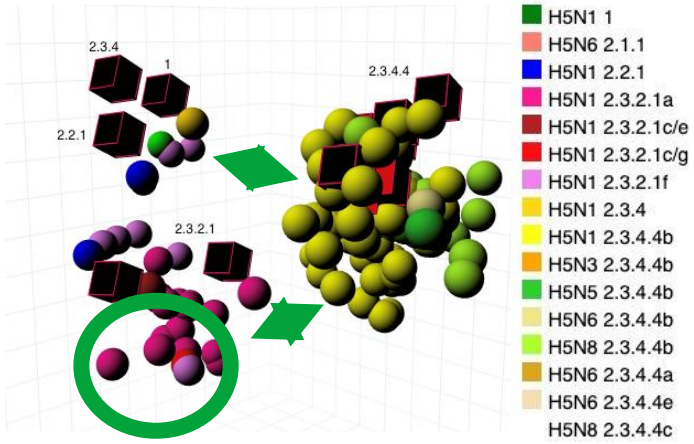


Tested >150 contemporary H5 avian influenza viruses against 19 antisera related to vaccine se

Providing a clearer picture of how H5 viruses are evolving antigenically



Findings and Implications for Vaccine Design



Some subtype-specific heterogeneity is beginning to emerge within clade 2.3.4.4b

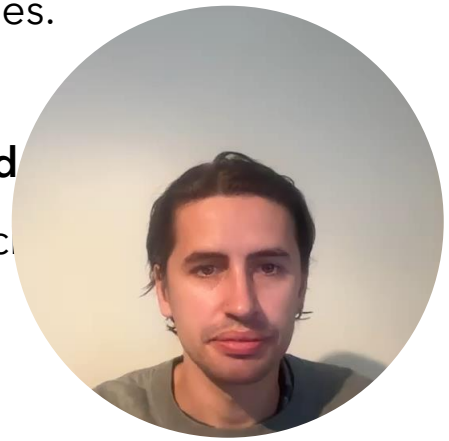
Wild bird viruses remain relatively stable, while poultry viruses show signs of immune-driven change.

A single vaccine may not protect equally well against all circulating clade 2.3.4.4b viruses.

Marked antigenic differences between older H5 vaccine strains, current clade 2.3.2.1, and current clad

Vaccine antigens outside clade 2.3.4.4 are antigenically distant and likely suboptimal for inactivated vacc

2.3.4.4 viruses.

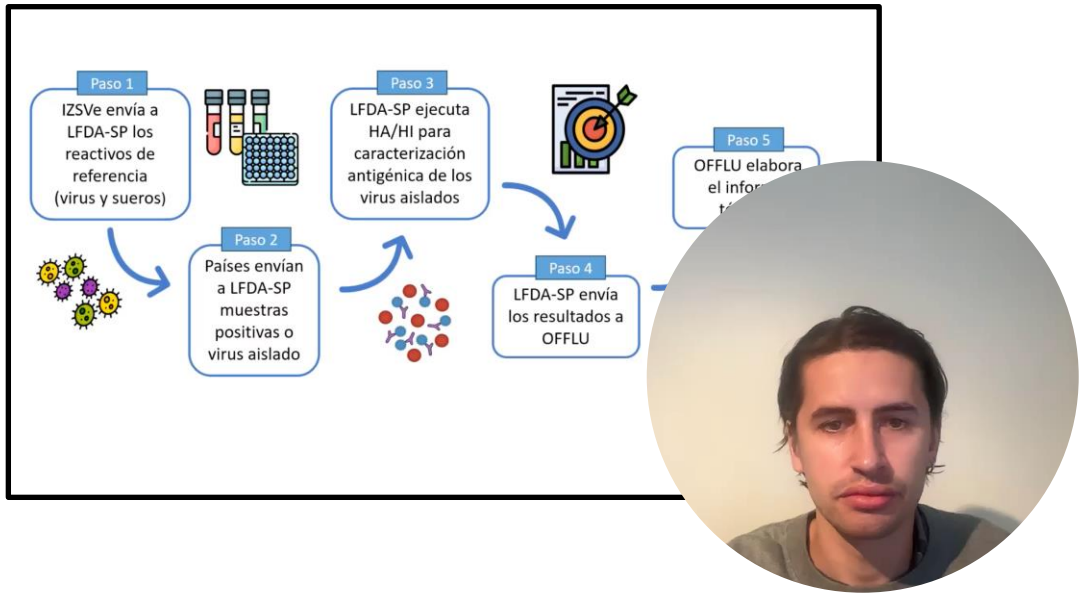


Strengthen the international network to broaden dataset coverage and address geographic and clade-specific gaps

Expand partnerships with additional laboratories and distribute pre-diluted HI assay plates with reference antisera to reduce virus shipment requirements, accelerate testing and build local capacity.

Initial shipments of reference antisera plates heading to FAO/WOAH Reference Laboratories in India (ICAR-NIHSAD) and Brazil (LFDA-SP).

A Spanish-language technical call was held in May 2026 to encourage virus sharing from countries across the Americas with LFDA-SP Brazil to facilitate antigenic testing for the AIM project.



Challenges and Future Directions

Obtaining geographically representative viral isolates remains challenging

Correlates of cross-protection for different poultry vaccine technologies remain poorly defined

Unreported or unofficial vaccination

May complicate interpretation of antigenic patterns and vaccine effectiveness.

Future Directions

Inclusion of additional virus subtypes

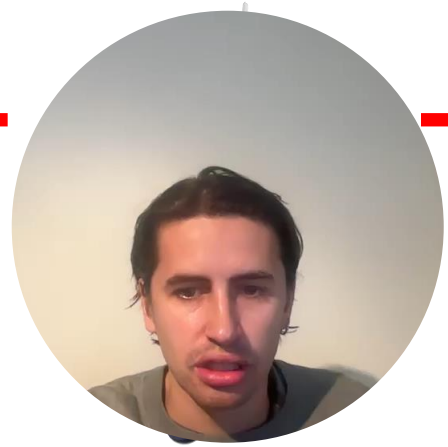
Extending the AIM framework to A(H7) and A(H9) viruses (preliminary work has begun)

Assessment of novel vaccine concepts

Evaluating computationally optimised broadly reactive antigens (COBRA) against contemporary circulating strains

Enhanced reporting and communication

Annual online meetings where laboratories present and discuss results on global antigenic diversity



Conclusions

Global interest in poultry vaccination is increasing.

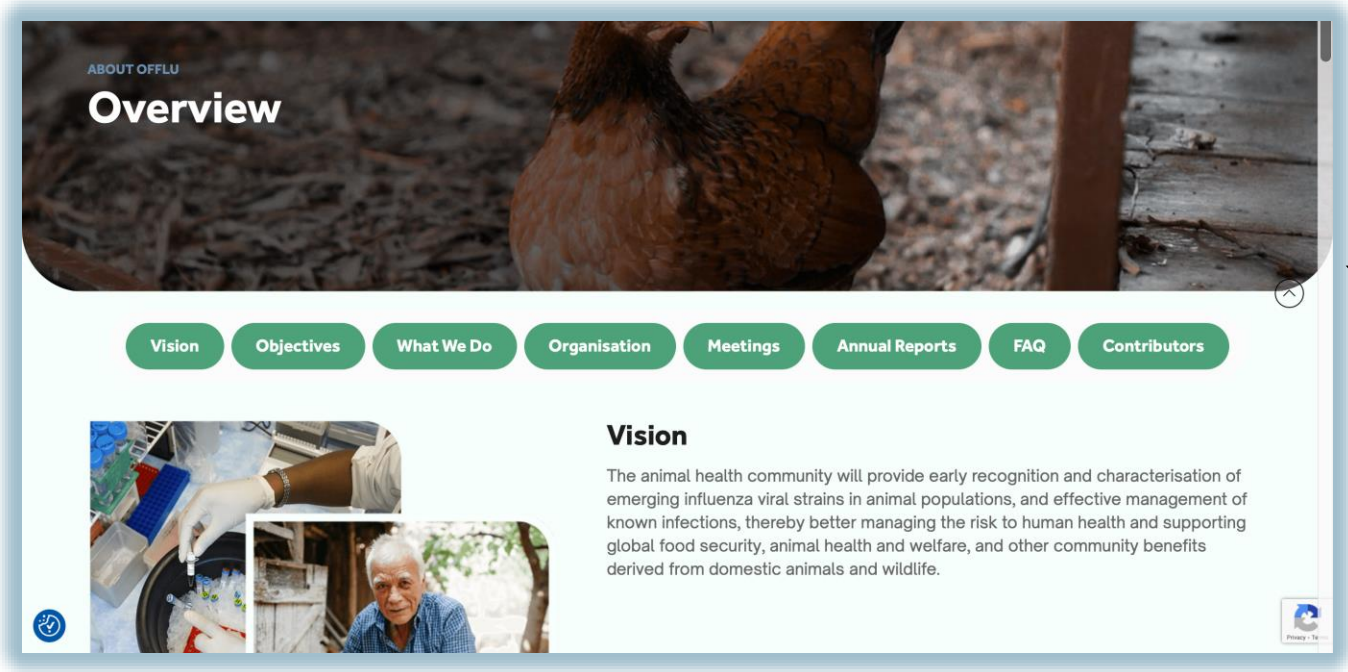
OFFLU AIM provides up-to-date evidence on the antigenic diversity of circulating avian influenza viruses that can help inform vaccine updates, including in the Americas.

Subtype and clade differences are likely to affect vaccine matching and field performance.

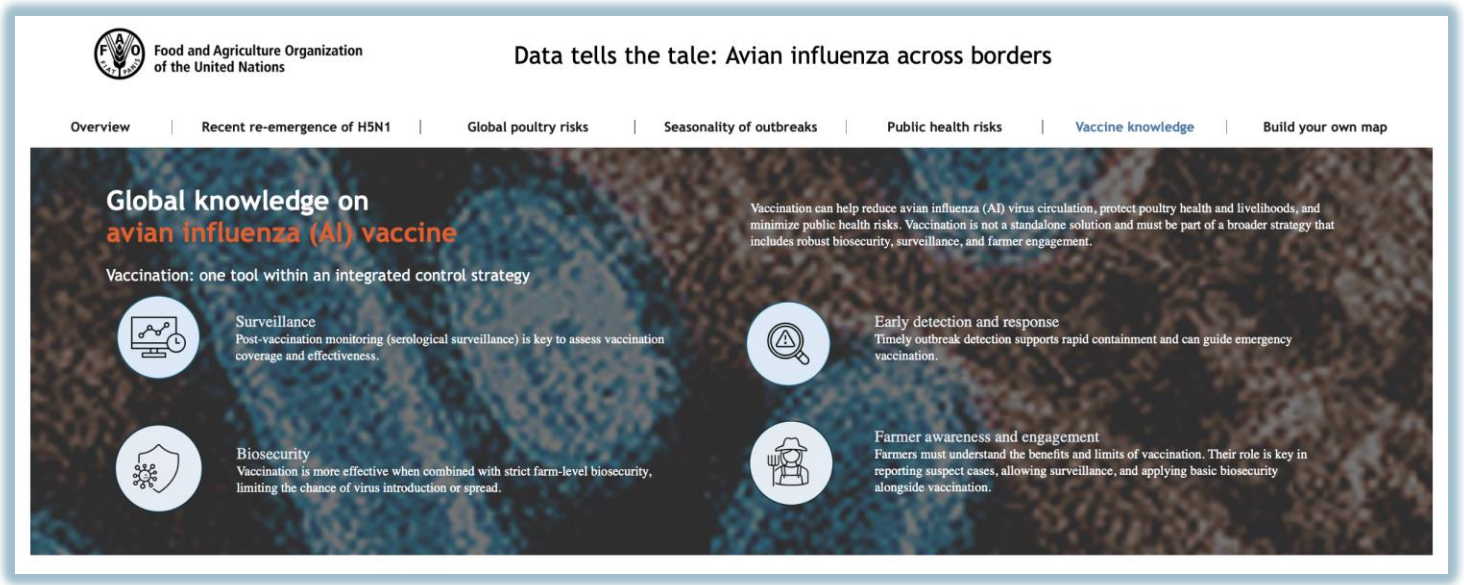
Findings support the need for regular vaccine updates, guided by real-time surveillance and antigenic data

The project is ongoing, with planned expansion to additional laboratories to improve coverage and gl

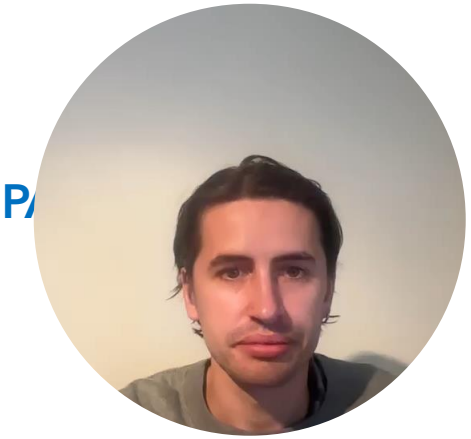
Involvement from the Americas will be critical to address regional data gaps.



[OFFLU Website (https://offlu.org)]



FAO HP



Thank you!

OFFLU would like to thank colleagues and contributors for continued support to OFFLU and to all contributors and countries for their kind and generous contributions of genetic material and information.

The OFFLU website has regular updates on OFFLU and parent organisations' publications, technical advice, protocols and many other useful links. Please visit: www.offlu.org for more information

For any questions please contact: secretariat@offlu.org

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