Vaccination as a control tool against HPAI

Recommendation of OIE/FAO Network of Expertise on Animal Influenza

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OIE Regional Representation for Asia and the Pacific
**Vaccines/Vaccination in National Control**

<table>
<thead>
<tr>
<th>Why Some countries have not used H5/H7 vaccines</th>
<th>Why are some countries using, have used or may use H5/H7 vaccines</th>
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</thead>
<tbody>
<tr>
<td>• Absence of AI in the country</td>
<td>• Stamping-out measures were not enough in large outbreaks</td>
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<td>• No immediate risk for outbreaks</td>
<td>• Control of localized infection ‘persistent’ in some population of poultry species (i.e. domestic ducks)</td>
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<td>• Stamping-out proved successful</td>
<td>• To protect expensive breeds and birds</td>
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<td>• Lack of adequate resources for vaccination</td>
<td>• Enzootic disease was present</td>
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<td>• High cost of vaccines</td>
<td>• Resources for vaccination were adequate</td>
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*From 2002-2010 survey to OIE Delegate for countries with HPAI outbreaks (65 of 80; 86%) as part of 16 month sabbatical to OIE*

Assessment of national strategies for control of high-pathogenicity avian influenza and low-pathogenicity notifiable avian influenza in poultry, with emphasis on vaccines and vaccination

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Current situation

- HPAI H5N1 enzootic in 7 countries
  - Vaccination in 4/7 enzootic countries (China, Indonesia, Egypt, Viet Nam) - *implemented only after the virus already well established in poultry*
  - Vaccination not employed as a control tool in 3/7 enzootic countries (Bangladesh, India, Nepal) - *Vaccination under trial study in Bangladesh*

- Great experience in vaccination in enzootic context also in Mexico (H5N2, H7N3) and in Pakistan (H7N3)

- No exotic country has eliminated HPAI H5N1 with vaccination
  - other than regionally with Hong Kong SAR in 2002/3
  - but elimination was not the objective in the enzootic countries

- Targeted Vaccination can support to eliminate of HPAI virus
  - Cote d’Ivoire, France, Netherlands, Israel, Russia, etc
Current situation (cont.)

• More data available on: influenza epidemiology, vaccine efficacy, optimized surveillance strategies, social and economic impacts
• New strategies/guidelines on vaccination produced
• New vaccines available (for hatchery/duck vaccination)
• Virus diversity increased (esp. H5N1 HPAI)
• H7N3 HPAI and H7N9 LPAI have emerged and surprised us all; i.e. broadening our view of diversity of zoonotic AI viruses and need for emergency control platforms including vaccines
AVIAN INFLUENZA VACCINATION

--> OIE information document

--> Verona Recommendations*

Background

This document was prepared with the support of FAO and the OIE ad hoc group on AI vaccination guidelines. The document was updated in 2006. Members of the ad hoc group included Dr Huatan Chang (China), Dr Peter Jones (UK), and Maragon (Brazil). The document was developed by the Technical Expert Group. The OIE International Committee approved the document, which included guidelines for the development of vaccines. The guidelines were approved in 2006 and updated in 2007.

Any Policy leading to the vaccination use must include an exit strategy

The document was first distributed to OIE delegates during the 74th General Session in May 2006 and has now been updated with the recommendations following the international scientific conference in Verona, Italy from 20 to 22 March 2007.

This document was developed, in conjunction with the guidelines published by FAO in September 2004, to provide urgently needed information to OIE Member Countries. This input from FAO in the preparation of the guidelines, is acknowledged.

* Verona Recommendations

The guidelines were developed in consultation with animal health experts, including Dr Huatan Chang, Dr Peter Jones, and Dr Maragon. The guidelines were approved by the OIE International Committee and included guidelines for the development of vaccines. The guidelines were approved in 2006 and updated in 2007.
Objectives

- To discuss the experiences gained and lessons learned from various countries in the vaccination field
- To follow on the 2007 Verona meeting on vaccination
- To address a few specific topics on vaccine usage and vaccination as a control
Topic areas

1. Current goals and status of HPAI control, and the role of vaccines/vaccination in success and failure of HPAI control and eradication, including lessons learned
2. Vaccines of today and products needed for the short-, intermediate- and long-term future
3. Process for identification of variant viruses, and methods to select and/or develop efficacious vaccine seed strains
4. The decision process for mass national vaccination campaigns or a more targeted approach to vaccination for individual countries, regions and/or production systems
5. Overcoming challenges in field application to maximize coverage and achieve population immunity in at-risk poultry population, including public-private partnerships

6. Serological monitoring to assess field coverage and individual bird protection

7. Surveillance to assess the effectiveness of disease and virus infection prevention

8. Determining the cost and logistic resources needed for an effective vaccination campaign and identifying the source of funding

Participants

- Vaccinating countries against HAPI (e.g. China, Egypt, Mexico, Viet Nam)
- International influenza experts (OIE/FAO Reference Centres)
- Representatives of poultry production companies
- Representative of International Federation for Animal Health (IFAH)
- Representatives of International Egg Commission (IEC)
- The OFFLU network (FAO and OIE laboratory experts, epidemiologists)
- OIE and FAO staff
# Strength and Weakness

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<tr>
<th><strong>Strength</strong></th>
<th><strong>Weakness</strong></th>
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<tr>
<td>Reduce mortality and morbidity in poultry</td>
<td>Possible maintenance of virus in vaccinated population</td>
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<tr>
<td>Reduce viral shedding and environmental contamination</td>
<td>Labor intensive and expensive</td>
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<tr>
<td>Maintain rural livelihood</td>
<td>Availability of inappropriate vaccines</td>
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<td>Public health (reduce human cases)</td>
<td>Difficulties in implementing mass vaccination campaign</td>
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Country Experience: Indonesia

- Beginning of 2004 disease was endemic
- Vaccination programme was not designed
- Late decision on vaccine choice
  - illegal (imported) vaccine used
  - Better legalise vaccines as soon as possible
  - Government allowed import of vaccines in beginning mention
  - Same time local production of HPAI influenza of one seed virus provided by the government
- Private sector used imported vaccines and tender local vaccines
- Vaccination with new vaccines led to reduced detection in Urban markets (FAO/government)
- Use of reverse genetics for lower risk of vaccine production not allowed by government
- Culling of infected farms still applied (voluntarily) in absence of compensation
Vaccine discovery research

- **Improve vaccine** for easier and broader application in the field, with induction of protective immunity earlier and lasting longer and being DIVA compatible
- **Develop protocols** for use of single or combination of existing vaccine technologies (inactivated whole influenza virus oil emulsion vaccines, subunit protein vaccines, rNDV, rFDV and rHVT) to improve protective immunity by eliciting broader and longer lasting protection
Recommendations
Recommendations (draft)

• The adoption of an interactive approach to disease prevention and control by continuously assessing the HPAI disease situation and the success of the implemented prevention and control strategies so as to be able to modify/adjust these strategies when needed.

• To continue implementing the OIE standards, guidelines and recommendations, the FAO guidelines and recommendations, and the FAO/OIE global strategy on HPAI.
Recommendations (draft)

• To consider vaccination when relevant as an additional tool to classical methods such as stamping out and increase of biosecurity, and modifications to production and market chains, with intelligent use of the suite of measures available.

• That vaccination should be considered on the basis of a comprehensive analysis including risk assessment of the country situation and context.

• A government-led programme for regular post-vaccination monitoring must be implemented in vaccinated poultry populations.
Recommendations (draft)

- Planning support tools should continue to be enhanced and vaccination handbooks providing practical guidance on vaccination programmes should be developed.
- OFFLU should help to coordinate and report influenza research needs.
- Importing countries respect the OIE standards to avoid unjustified trade barriers related to vaccination against avian influenza.
- Support be given for the strengthening of veterinary services and improve their governance when appropriate to assist them in complying with the relevant OIE international standards.
Recommendations (draft)

- To consider **hatchery vaccination** using vector vaccines as one of the approaches for control and prevention of HPAI
- Vaccination using vaccines with inactivated antigens should not be used for at least the first 7 days of life in chickens
- To strengthen public-private partnerships (PPP) including **links with farmers organisations**
- **Targeted vaccination** with epidemiological surveillance using improved technology, cost sharing (PPP) and increased biosecurity can be considered
Summary

- Exit strategy to be included in vaccination programme
- Surveillance of whole population of poultry
- Post vaccination monitoring for vaccinated flocks
- Sharing information and laboratory networks
- Smooth registration procedures
- Research needs to develop DIVA vaccines to facilitate Post Vaccination Monitoring and surveillance
- Usage of bivalent vaccines
- Public-private partnership
Thank you for your kind attention