



HPAI-EGYPT

AI Vaccination in Egypt: An Assessment



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- *General Organization for Veterinary Services (GOVS);*
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- *Emergency Centre for Transboundary Animal Diseases (ECTAD), FAO-Egypt; and*
- *With the collaboration of the French Agricultural Research Center for International Development (CIRAD)*



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AI Vaccination - An Update

AI Vaccines and Vaccination - Merits and limitations

Vaccination against HPAI should only be considered as a tool amongst a comprehensive HPAI control package, which includes improvement of surveillance systems; outbreak management and bio-security measures. As a matter of fact, AI vaccination does not confer sterilising immunity. It would increase resistance of the host to the disease but, would neither prevent infection nor contact transmission. Moreover, complete protective immunity will take two weeks to develop and multiple doses are required to confer long term protection. Constraints related to efficacy of AI Vaccines are also linked to the type of vaccine and its formulation (antigen content, adjuvant, viral strain) as well as the age, species and type of breed of the targeted birds.

Control without vaccination is an option if there is an efficient outbreak management and reinforcement of the bio-security measures (e.g. Nigeria; Turkey; Hungary; Thailand; EU countries). If vaccination is to be used it is worth bearing in mind that **vaccination alone will neither control nor eradicate the disease**. Mass vaccination applied with limited outbreak management and bio-security measures would fail to control the infection (e.g. Indonesia, Egypt).

HPAI CONTROL REQUIRES AN INTEGRATED PROGRAM CONSISTING OF THE REINFORCEMENT OF:

- Surveillance system
- Bio-security measures
- Outbreak management

Vaccination Should be Integrated within this HPAI Control Program (Package)

Current Practices in Egypt

Vaccination against AI in Egypt has been used for the last three years and as a principal major to control the epidemic of HPAI. The focus on vaccination has apparently reduced the emphasis to other control measures such as disease surveillance, biosecurity and sound outbreak management interventions. According to a recent assessment study, poultry vaccination against HPAI in Egypt has the following features:

- Absorbs more than 80% (2007-8) and 94% (2009-10) of the available budget for HPAI control.
- Since May 2006, vaccination of poultry in the household sector (sector IV) is implemented by the government and free of charge
- Commercial farms (Sectors I, II, and III) carry out vaccination at their own expenses. However, no information on the practices and scale of operation.
- There is no post-vaccination monitoring in both the household and commercial poultry sectors.
- Only inactivated vaccines are used: mostly H5N1 Re-1 Chinese vaccine type for household poultry and H5N2 vaccine type for commercial farms.
- AI vaccines are evaluated according to international standards by the Central Laboratory for Evaluation of Veterinary Biologicals (CLEVB) (Fig. 1 below) before their use .



Fig. 1. Vaccine evaluation in progress at CLEVB

AI Vaccination (Cont.)



An example of door-to-door AI Vaccination (Photos above and below)



Sectors 2 and 3 Chicken Broilers farm



Sector 4 Ballady Hatchery

Vaccination of household poultry	Limitations
2 campaigns per year, each one lasting for 3 month, the vaccination team going from door to door to vaccinate all the birds	Limited coverage efficacy with a maximum of 36% of the total bird population being vaccinated Risk of mechanical disease transmission with the door to door vaccination protocol
Only one dose of vaccine is administered for all birds	Booster doses are required with inactivated vaccines to confer long term protection and limit contact transmission especially in groups of mix ages and species
Chicks and duckling are vaccinated	Inactivated vaccines are not efficient in day old birds and vaccination at young age could impair adult immunity
In some Governorates double or more volume dose of vaccine is given to ducks and geese	Vaccination protocols are not homogeneous within the country as there is no standard operating procedures in place, veterinarians tend to follow instructions on the vaccine bottle
Vaccination in commercial farms	Limitations
One dose is administered to broilers and multiple doses to layers and breeders	Vaccination protocol varies from farm to farm as no proper standardised protocols are in place, most of sector 3 farms would not vaccinate their broilers
Day old chicks are vaccinated in hatcheries	Inactivated vaccines are not efficient in day old birds and vaccination at young age could impair adult immunity
Most of the duck and geese farms are not applying HPAI vaccination	Without any regular monitoring, there is a risk for silent circulation of field virus in the environment (ducks and geese are most of the time asymptotic carrier)
There is some post-vaccination monitoring performed by private laboratories National monitoring is done on a volunteer basis which represents only 6.5% of total farms	No information is available on vaccination coverage and effectiveness in farms There is an increasing risk for silent circulation of field virus within vaccinated flocks and spread of the infection to household sector if the birds are sold to local markets

Current Vaccination Strategy

Impact on Disease Control

Indeed, effectiveness of the campaign is very limited: the vaccination coverage is very low and would not be sufficient to contain the disease; outbreaks are ongoing unreported as demonstrated by the participatory disease surveillance implemented as part of FAO-GOVS SAIDR project (if you look for HPAI outbreaks, you will find them). The apparent decrease in outbreak number since the beginning of the mass vaccination campaign is attributable rather to the prevailing low disease reporting rate rather than the improvement in disease control. This low reporting is partially due to the limited incentives of the owners to declare an outbreak (absence of compensation and fear for the faith of their birds).

Risks for Infection Spread and Human Health

Limited bio-security precautions: improper use of PPE



Overshoes are worn to protect Vaccinator's feet

Sampling of sick bird during investigation of outbreak wearing only gloves no disinfection of needle



Limited Efficacy

The current vaccination strategy has most probably very little impact on the control of HPAI infection because of:

- The low coverage (35%) with an estimated protective coverage below 20%, well under the flock immunity threshold required to control HPAI epidemics (at least 50% protective coverage).
- The improper use of inactivated vaccines: i) no booster doses are administered to a mixed poultry population (different age, species and race), this would have an impact on the level and duration on the immune response; ii) vaccination of day-old birds (DOBs) with inactivated vaccines would further impair immunity of the adults (see above picture of day old chick



vaccination).



Vaccination of supposed healthy birds wearing complete PPE—Good Practice that need to be replicated during outbreak mangement

Current vaccination (Cont.)

Risks (Cont.)



Vaccination of sick birds and emergency vaccination around outbreak sites



Limited Awareness on Risks for Human Health - Children crowded in infected premises and at the disposal site (also poorly selected)

Improvement of AI Vaccination Strategy for in Egypt: Recommendations



At the end of the assessment period a workshop was organised to present the results of the assessment of Egypt vaccination strategy against HPAI and to discuss its perspectives for HPAI control program. The aim of this workshop was to draw final recommendations with all the actors on new HPAI vaccination strategy in Egypt to be sent for approval by the Supreme committee. The level of attendance to the workshop met the target: 44 participants from all the institutes implicated in HPAI control program (GOVS, NLQP (AHRI); CLEVB; National HPAI Technical Committee; Veterinary Services from 3 governorates: Beheira; Dakhalya; Six October; Representatives from the poultry industry; FAO-ECTAD) including representatives from UN; WHO; USDA and resources persons from the University of Cairo and CNRS.



Two

groups were organised to discuss 1) Options for targeted HPAI vaccination in Egypt and 2) policies on HPAI vaccination. At the end of the session, the recommendations from the two groups were presented and finally compiled and presented by GOVS for final approval.

1) Strategic and risk-based vaccination

- Different policies for targeted vaccination have been defined for commercial and household poultry production sectors.

Commercial Farms

- **Compulsory** vaccination for all commercial sectors (I, II, III) under the supervision of the public veterinary services
- **Vaccination** program should have a DIVA approach (include sentinel birds in vaccinated flocks). Standardized virological surveillance needed to monitor the viral activity.
- **Surveillance** and adequate response for positive cases
- **An operational plan with clear indication of a control and eradication phase as well as defined Exit strategy** is a prerequisite
- **Long cycle broilers (>1 month) and long-living birds (breeders and layers):** primary injection at 14 days of age and booster dose 3-4 weeks later; repeated booster every 4 months
- **Short cycle broilers:** one dose at 14 days old
- **No vaccination of day old birds (hatcheries)**



- Different protocols have been defined according to the type of birds (production type , age and species/ breed)

Recommendations (cont.)

(Cont.)

Household poultry sector



- **Vaccination targeted** to at risk areas (defined according to number of poultry and human cases and poultry density)
- **Vaccination before** at risk period (in Sept and Oct, before the winter); no vaccination during the risk period (winter)
- **Booster doses** required

- **Vaccination of birds** in nurseries at age of 3 weeks (just before sale)
- **All the birds:** primary dose at 14 day old, booster 3-4 weeks later
- **Ducks and geese:** double volume dose should be used as compared to chicken
- **No vaccination of day old birds**



- **Not performed during outbreak:** ring vaccination in outbreak situation should be discouraged. Under the Egyptian context, such an emergency vaccination is most certainly propagating the infection (this would explain why as it has been reported by poultry owners in many cases the birds would suddenly die soon after the vaccination).
- **Sustainable:** provisions need to be made to ensure vaccine supply; implementation and proper monitoring
- **Planned with an exit strategy:** HPAI control would need to be planned for the next four years based on the assessment and on the recommendations, the plans would need to be revised yearly according to the impact on disease incidence.
- **Complemented with training and education of technical staff** on vaccination issues (bio-security; vaccine administration; personal safety measures ; communication to communities; professional ethics)
- **Implemented with full awareness and cooperation of the community** (to support disease control/eradication interventions; to prevent disease spread in animal population; to prevent human exposure)

2) Vaccination policy

Vaccination against HPAI in Egypt needs to be:

- **Properly defined and integrated within a comprehensive control program:** national AI vaccination strategy; detailed SOPs for implementation; plans for logistics and practical issues; routine vaccine evaluation and efficacy under local context
- **Properly monitored** under government control and regulation (including commercial sector):
 - sero-surveillance for vaccination effectiveness
 - surveillance of circulating virus for monitoring of viral mutations

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The Final Report on the Assessment of AI Vaccination in Egypt will soon be available to all interested partners

