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1/20

H5N1 HPAI and Vaccination

- General point of view -

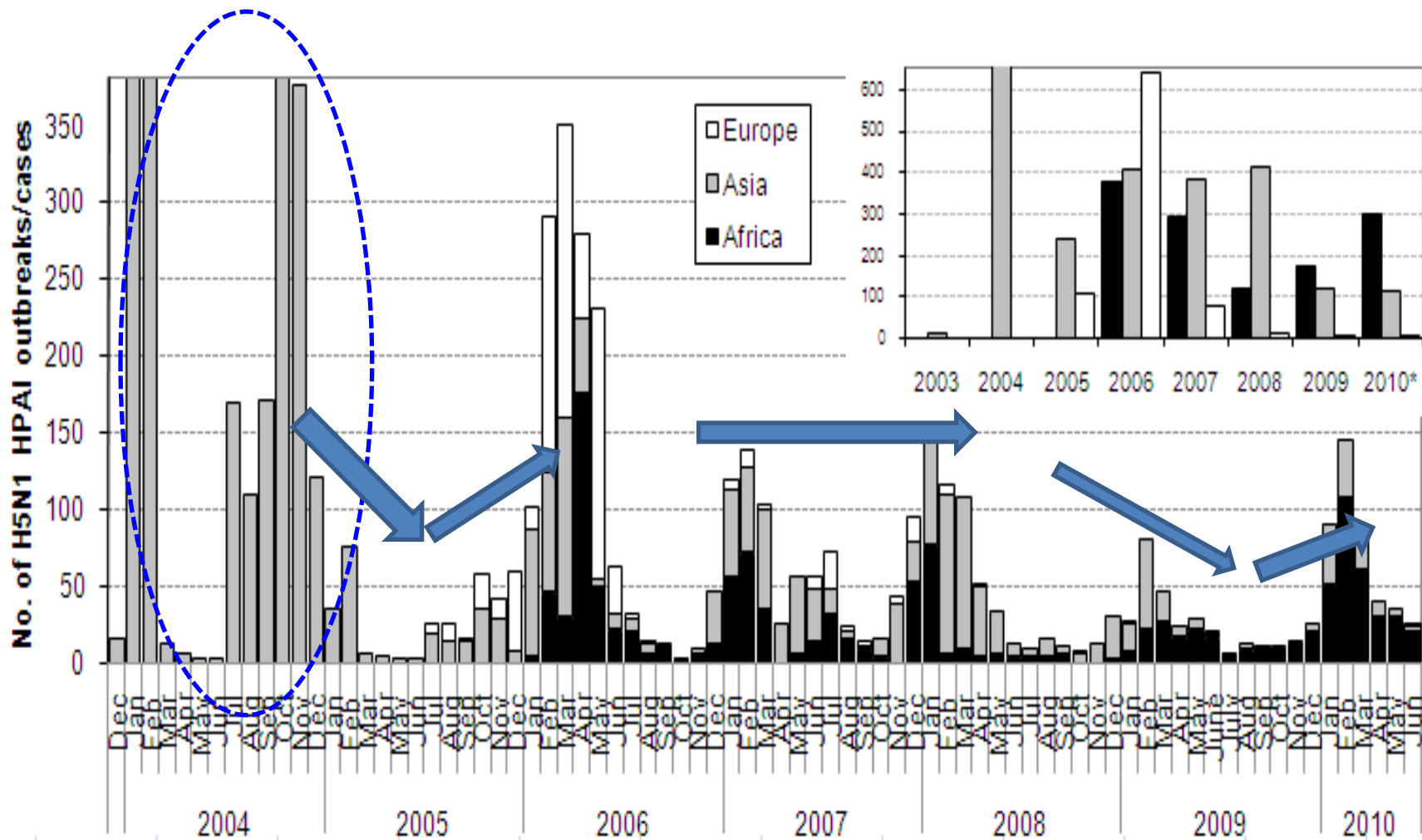
**4th OIE Regional Meeting on Strengthening Animal
Health Information Networking in Asia
(Chiang Mai, Thailand, 14-16 September 2011)**

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OIE Asia-Pacific**

Key points of the presentation

1. H5N1 HPAI situation
2. Countries/Territories that do or do not use vaccine
3. Classical control measures
4. Vaccination strategy
5. Difficulties in controlling H5N1 HPAI
6. Aims of use of vaccine
7. Issues of vaccination
8. Quick review of country reports of HPAI control

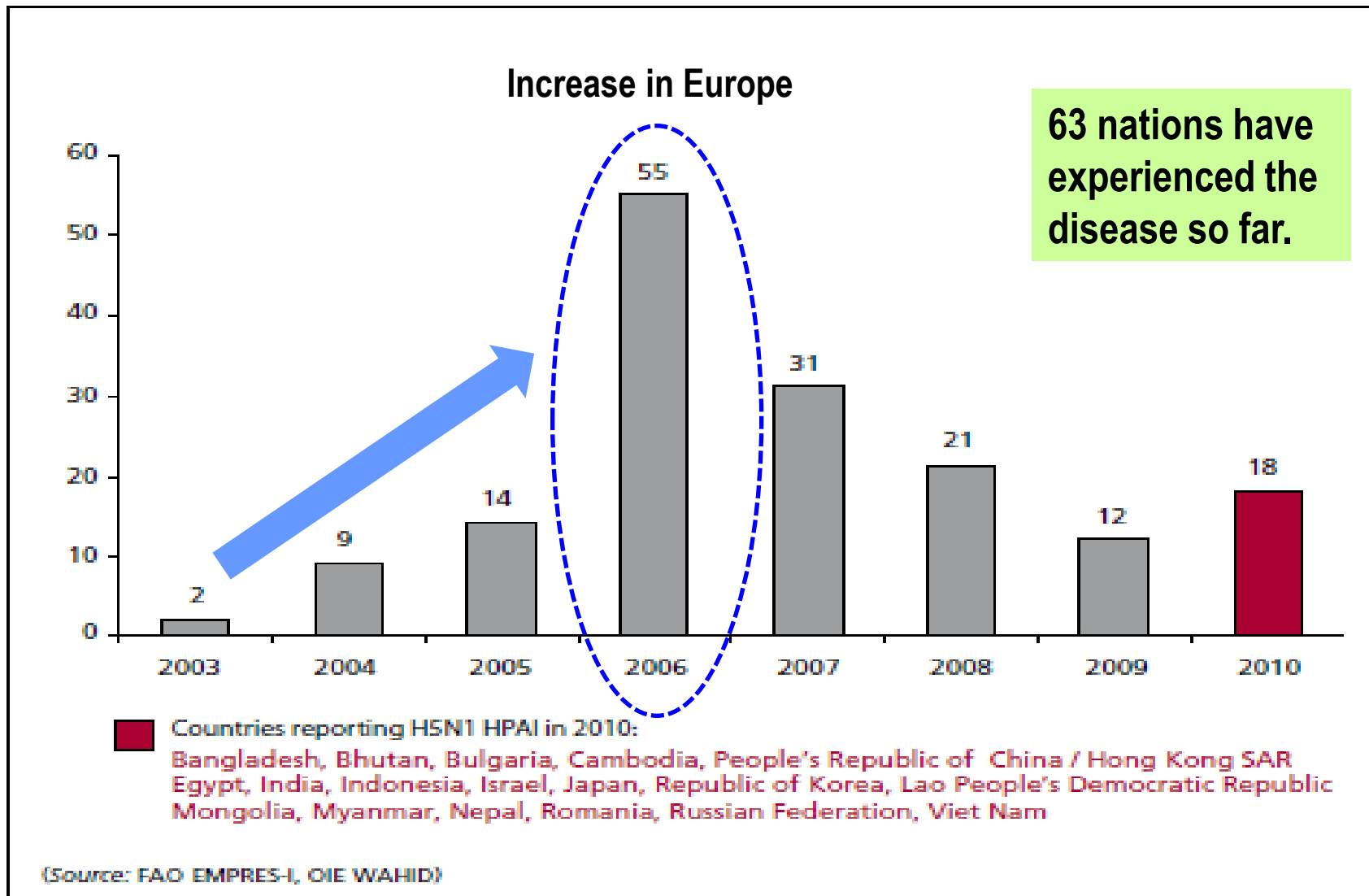
H5N1 HPAI outbreaks in birds since December 2003



Vaccination in Vietnam

Source: FAO:EMPRES-I

Number of N5N1 HPAI infected countries from 2003 to 2010



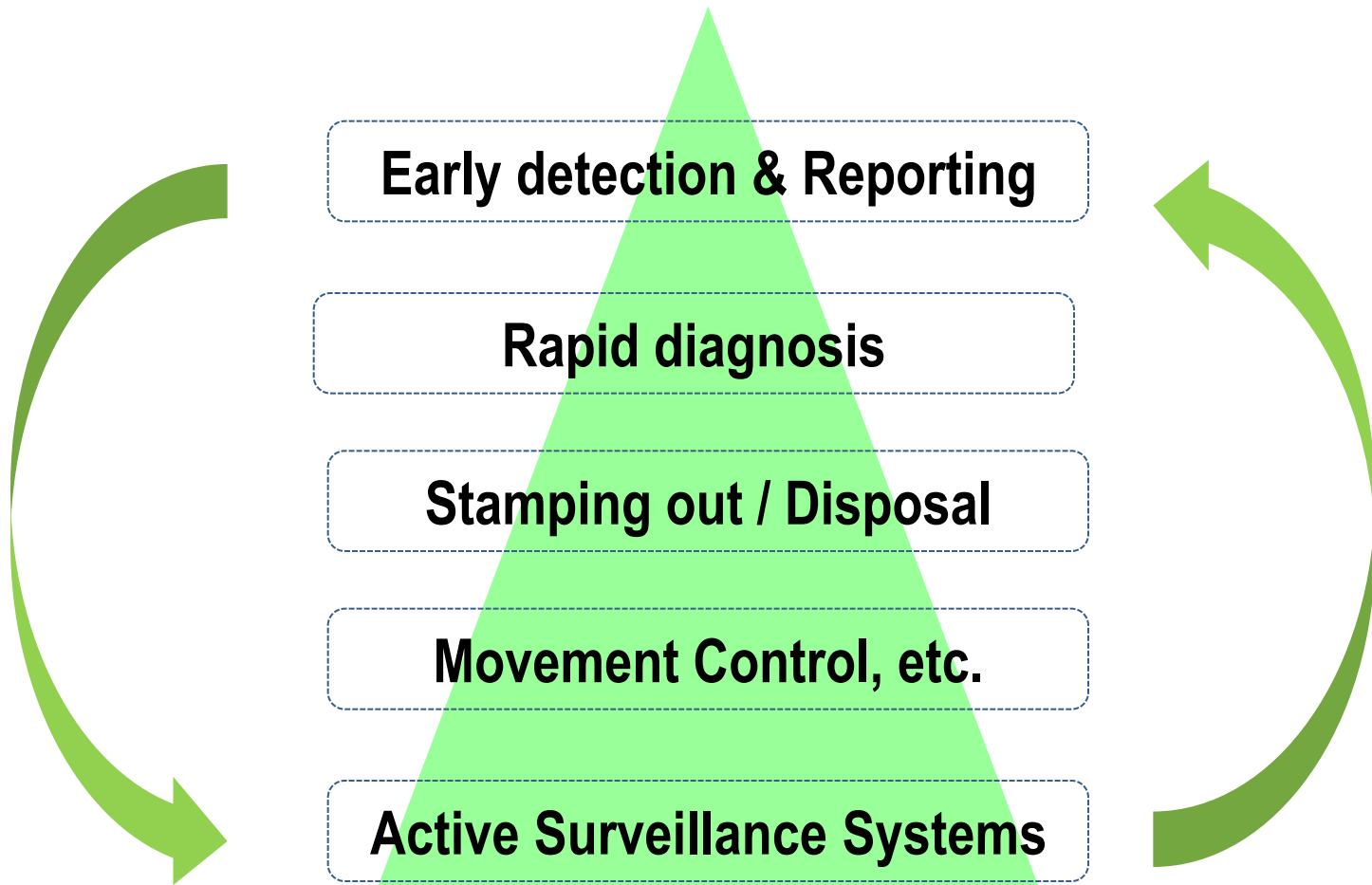
Epidemiological situation of H5N1 HPAI in poultry in Asia

H5N1 Status	East Asia	Southeast Asia	South Asia
1. Persistent	PR China	Indonesia Vietnam	Bangladesh India
2. Sporadic		Cambodia Myanmar	
3. Free- Reintroduction- Eradicate-	Japan RO Korea Hong Kong (?)	Laos	
4. Free (Eradicated)		Malaysia Thailand	Bhutan (?) Nepal (?) Pakistan
5. Never reported	C. Taipei Mongolia	The Philippines Singapore Brunei	Maldives Sri Lanka

Countries/territories in Asia that do or do not use vaccine

Use vaccine	Do not use vaccine
<ol style="list-style-type: none">1. PR China2. Hong Kong SAR3. Indonesia4. Vietnam <p>Mongolia</p>	<ol style="list-style-type: none">1. Bangladesh2. Bhutan3. Cambodia4. Laos5. Mongolia6. India7. RO Korea8. Japan9. Malaysia10. Myanmar11. Nepal12. Pakistan13. Thailand

Main Classical Control Measures



● **Good Governance of Veterinary Services**

● **Legislation support**

Difficulties in controlling H5N1 HPAI

I. Socio-economic aspects:

1. Production systems (Animal husbandry practices)

(1) Household backyards (2) Roaming ducks, (3) Free range/grazing ducks, etc.

2. Marketing systems (complex market chain)

(1) Live bird markets (2) Wet markets, etc.

3. Social customs

4. Cultural aspects, etc.

II. Domestic ducks, etc:

- 90 % of the world's domestic duck population is in Asia and 75% of them are found either in PR China or Vietnam.
- Do not necessarily manifest clinical signs.
- Difficult to detect infection.



When to consider using vaccine ?

● 3 vaccination strategies

1. Preventive vaccination:

When a high risk of virus introduction is identified and early detection and rapid response may not be enough to combat the disease.

2. Emergency vaccination:

When there is evidence of H5N1 virus introduction , or the epidemiological situation indicates that there could be massive and rapid spread of the disease.

3. Routine vaccination:

When the disease is endemic.

Main aims of Vaccination against H5N1 HPAI



1. Introduction of a protective immunity in a target population:

□ Well-vaccinated poultry, if infected:

- Clinical signs not severe
- Decrease in viral shedding (Amount & duration)

2. Level of exposure and susceptibility:

Reduce level of infection, mortality, production losses and the threat to humans.

3. Long term effect:

- Decrease the prevalence of infection to a certain level where classical control measures including stamping out and active surveillance can work effectively enough to eradicate the disease.
- Give time to take actions to change socio-economic factors, etc.

Question

What are the major concerns about vaccination?

“In Asia, HPAI H5N1 virus strains have persisted in domestic poultry for 12 years and antigenic variants have been generated.”

Two issues: Use of vaccine



Inappropriately managed vaccination will complicate disease control and may promote spread of HPAI.

1. “Silent infection” or “Silent virus spread”

- Vaccinated birds may become infected and the infection may spread in vaccinated flocks in specific situations.
- It becomes harder to detect the infection due to reduction in clinical signs.
- The use of vaccine alone will not eliminate infection.

2. “Antigenic change/drift”

- Long-term circulation of the virus in a vaccinated population may result in both antigenic and genetic changes.
- Use of different vaccines and vaccine antigens may result in emergence of antigenic variant viruses in the field.

In conclusion.....,

Vaccination is a complementary measure in specific situations:

- **Vaccination should be considered as an additional measure, not a substitute measure for stamping-out.**
- **Vaccination should be always accompanied by classical control measures including stamping out.**
- **All vaccines must comply with the OIE standards and afford protection against viruses found in a country.**
- **Post-vaccination monitoring and surveillance should be undertaken to detect antigenic/genetic variant strains in the field.**

**26th Conference of the OIE Regional Commission for Asia,
the far East and Oceania (PR China, November 2009)
-Recommendation-**

“Vaccination is a relevant complementary measure in specific situations to prevent and control the disease. In these cases vaccination should be used in addition to, not instead of stamping out.”

Quick review of Country reports in HPAI control

1. Members with vaccination: 4 Members

PR China, Hong Kong SAR, Indonesia and Vietnam

2. Members without vaccination: 10 Members

Bangladesh, Bhutan, Cambodia, Japan, RO Korea, Malaysia Mongolia, Myanmar, Nepal and Thailand

Report from 4 Members where vaccination is in practice (PR China, Hong Kong SAR, Indonesia and Vietnam)

- 1. Overview of the recent H5N1 HPAI outbreaks**
- 2. Overview of the poultry industry**
- 3. Principal control measures against HPAI**
- 4. Framework of vaccination programme**
- 5. Active surveillance programme**
- 6. Evaluation of Efficacy of vaccine in your country/territory**
- 7. Advantages of using vaccine**
- 8. Disadvantages/challenges of using vaccine**
- 9. Major concerns about the HPAI control measures with vaccination**
- 10. Medium and long term viewpoint to control HPAI with using vaccine**
- 11. Long term strategy to eradicate H5N1 HPAI**

Report from 10 Members where vaccination is not in practice **(Bangladesh, Bhutan, Cambodia, Japan, RO Korea, Malaysia, Mongolia, Myanmar, Nepal, Thailand)**

1. Overview of the recent H5N1 HPAI outbreaks
2. Overview of the poultry industry
3. Position/Policy of your country's HPAI control measures without using vaccine
4. Principal control/preventive measures
5. Active surveillance programme
6. Advantages of your country's HPAI control measures without using vaccine
7. Challenges of HPAI control measures without using vaccine
8. Major concerns over the HPAI control measures without using vaccine
9. Medium and Long term view to control/eradicate/prevent HPAI
10. Long term strategy to eradicate HPAI without using vaccine (for countries where HPAI is persistent.)

Advantages and disadvantages - Control measures with vaccine -

Advantages	Disadvantage/Challenges
<ol style="list-style-type: none">1. Reduce the number of outbreaks2. Mitigate the risk to humans3. Quality of data improved	<ol style="list-style-type: none">1. Accelerate antigenic drift and mutation2. New strains may escape detection3. Frequent change of vaccine4. Continuous virus shedding5. High cost for vaccination6. High cost for post monitoring survey

Advantages and disadvantages -Control measures without vaccine-

Advantages	Disadvantage/challenges
<ol style="list-style-type: none"><li data-bbox="146 572 826 625">1. No cost for vaccination<li data-bbox="146 646 852 853">2. No need to differentiate between vaccinated and infected bird<li data-bbox="146 875 703 928">3. International trade	<ol style="list-style-type: none"><li data-bbox="1029 558 1688 689">1. Possibility of illegal importation of vaccine<li data-bbox="1029 711 1479 763">2. High mortality<li data-bbox="1029 785 1634 838">3. High cost for culling<li data-bbox="1029 859 1792 991">4. Bio-security of small scale farms

Government decision not to use vaccine

- 1. Prioritize the effective control and prevention measures supported by the early detection and rapid response including stamping out, movement control, active surveillance, etc.**
- 2. Vaccine cannot protect birds from infection**
- 3. Difficult to differentiate vaccinated animals and infected animals**
- 4. Cost for vaccination**
- 5. Cost for post monitoring survey**
- 6. Support from stakeholders, etc.**

Main common challenges to control H5N1 HPAI

1. **Poor Bio-security of small scale farms (Backyards, etc.)**
2. **Free grazing ducks**
3. **Wild birds (Migratory birds)**
4. **Difficult to control animal movement (illegal movement, complex marketing system, etc.)**
5. **Lack of relevant legislation support**
6. **Border control for illegal transport of animals and their products**

Thank you for your attention.