Avian Influenza National, Regional and Global Outlook

Dr. Qurban Ali Pakistan
Disease Definition

- Bird flu, or avian influenza, is a disease caused by viruses.
- It is a contagious disease which infects only birds, and sometimes pigs.
- The avian influenza viruses attack specific species - they have, on occasions jumped the species barrier and infected human beings though rare.
- There are two main types of avian influenza - one is fairly mild while the other is deadly (for birds).
AIV Experience in Pak (1995-16)

- In 1995 first outbreak of HPAI H7N3: confined to 100 km area. Culling, strategic vaccination helped to control in 3 months.
- In 1998 outbreak of LPAI H9N2 occurred in broilers, spread to layers and now endemic.
- In 2000 4 outbreaks of HPAI H7N3 occurred in small layer area, controlled by vaccination.
- Nov 2004-05, 68 HPAI H7N3 outbreaks in Karachi in layers & spread to BB (~Losses $40 M). Selective culling and vaccination
- Feb-July, 2006, 48 HPAI H5N1 outbreaks recorded. Culling, and strategic vaccination carried out (~Losses $22m).
- Feb-Nov, 2007 59 HPAI H5N1 outbreaks recorded in commercial & back yard poultry. {1.2 m birds culled & compensated}; 20 cases of wild bird infections recorded.
- Feb-June 2008, 8 HPAI H5N1 outbreaks recorded in commercial poultry
- Since June 2008, Pakistan is free from AIV H5N1
- In 2010 LPAI H3N1 (1) isolated from domestic poultry from AJK
- In 2010-11 LPAI H4N6 (2) isolated from LBM in Karachi (wild birds/ducks)
- In 2013 LPAI H14N3 (3) isolated from LBM in Karachi (Wild birds/ducks
- 2006-16, LPAI H9N2 is endemic in all Pakistan
- NO HPAI ISOLATED SINCE JULY 2008
History of AI in Pakistan

• Since 2003, Avian Influenza viruses of different types have been severely affecting the growth of commercial and backyard poultry.
• During the Avian Influenza virus H7N3 outbreak of 2003-04, it was realized that some nationally coordinated efforts were required to establish avian disease surveillance system in this country for the preparedness of encountering a rapid response against the introduction of any new disease.
Situation Analysis of Avian Influenza in Pakistan

• The first case of human infection with H5N1 avian influenza was confirmed in Nov. 2007 in Pakistan.

• Laboratory tests conducted by the WHO H5 Reference Laboratory in Cairo, (Egypt) and WHO Collaborating Center for Reference and Research on Influenza, (London, United Kingdom) confirmed the presence of avian influenza virus strain A(H5N1) in samples collected from one case in an affected family.
• Government of Pakistan took prompt action to prevent and control the virus in the country and launched control Program at the national level.

• The Program addresses all epidemiological phases of expected influenza outbreak i.e. Pre-Pandemic, Pandemic and Post-pandemic for efficient, timely and comprehensive response to contain outbreak, prevent possible losses of life and social disruption through mobilizing all national and provincial line departments, NGOs and Civil society.
# Overview

## National Ref Lab for Poultry Diseases

<table>
<thead>
<tr>
<th>Country</th>
<th>&lt;<strong>PAKISTAN</strong>&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the Laboratory</td>
<td>National Reference Lab for Poultry Diseases (NRLPD),</td>
</tr>
</tbody>
</table>
| Status        | - SAARC Regional Leading Diagnostic Lab (RLDL) for HPAI  
                - ISO/IEC 17025:2005 internationally accredited |
| Poultry Diseases | Reference Lab for **Highly pathogenic Avian influenza (HPAI)** |
| Administrative Control | Pakistan Agricultural Research Council, Ministry of National Food Security and Research |
| International Recognition | (FAO) |
# Diagnostic Facilities

<table>
<thead>
<tr>
<th>Name of the Disease</th>
<th>Highly pathogenic Avian Influenza (HPAI)</th>
</tr>
</thead>
</table>
| Test of choice (first test) | ELISA/PCR/strip test/agent isolation (mention one)- provide for each priority disease (National labs)  
1. PCR for HPAI (as it is HPAI so first choice would be PCR for early detection) |
| Other tests | In descending order:  
Virus isolation & Identification/AGPT/ELISA/HI, IVPI |
| Tissue culture | Yes |
| Cell lines | Continuous: Vero/QT35/  
Primary: CEF/CEL/CEK |
| Antigenic/genomic characterization | Yes |
| Details | Sequencing, Antigenic mapping ,  
Sequencing, sequence & phylogenetic analysis, & antigenic cartography. |
# Diagnostic Facilities

<table>
<thead>
<tr>
<th>Source of laboratory kits and reagents (specify disease wise)</th>
<th>(home grown, commercial, reference Lab) HPAI- home grown, commercial (IDEXX, GD-Holland, VLA-UK, IZSVE Italy, X-Ovo, Invitrogen, ABI)</th>
</tr>
</thead>
</table>
| Essential equipment available                               | 1. Thermocycler (Conventional & Real-time)  
2. Gel Electrophoresis & Gel Doc Systems  
3. EP Motion Pipetting Robot  
4. Low & high speed Centrifuges  
5. Plate Reader  
6. ELISA Plate Readers,  
7. Genetic Analyzer/Sequencer  
8. Biosafety Cabinets Class-III & II  
9. Incinerator  
10. Chicken isolators  
11. Refrigeration and freezing equipment  
12. Support equipments |

Ministry of Science & Technology
Government of Pakistan, Islamabad

Certificate of Accreditation

is awarded to

National Reference Lab for Poultry Diseases (NRLPD),
Animal Sciences Institute, NARC,
Islamabad, Pakistan

in accordance with the requirements of ISO/IEC 17025:2005
The accreditation is subject to regular surveillance and compliance
to the requirements of PNAC
For scope of accreditation, see Appendix

Accreditation Certificate Number: LAB 080

Date of Issue:
27-11-2014

Valid until
26-11-2017

Director General
Salient Features

• The lab has so far run 14 Nationally & Internationally funded research projects in the area of avian health, resulting in training lab staff from national and regional labs as well as extending research assistance to 24 M. Phil. and 8 PhD students.

• Furthermore, due to international accreditation (ISO-17025) acquired by NRLPD, the clinical samples for avian disease diagnosis are not being dispatched abroad any more.

• The surveillance activities coordinated by NRLPD have led to achieve freedom for Pakistan from “bird flu” in July-2008, avoiding annual losses of USD 80-100 m.
National Avian Disease Surveillance Set up

Avian Disease Surveillance Set up:
- AVIAN DISEASE DESK, AHC, Ministry of Food Security and Research (M/o NFSR).

- National Program for Surveillance & Control of Avian Diseases,
  {PMU at Nat. Reference Lab for Poultry Diseases, NARC, Islamabad}

Collaborating Units:
Provincial Coordinating Offices, DGs (6)
Provincial Avian Disease Surveillance Labs (10)
Regional Surveillance Units (40)
Rapid Response units (66)

6 coordinating for AIV surveillance
37 working in zoonoses
42 in place with trained manpower
NATIONAL AVIAN DISEASE RAPID RESPONSE UNITS NETWORK PAKISTAN
Poultry Disease Monitoring Areas in Pakistan using National Surveillance System
Movement of specimen, sharing of results

Sub Regional Surveillance Units/End User/Farmer

Regional Surveillance Units

Provincial Surveillance Units

Federal Surveillance Unit/NRLPD

Rapid Response Units

N.I.H

A.H.C/ CVO

M/o NFS&R

OIE

Sample

Result / Information

Action / Response
SUMMARY OF SURVEILLANCE WORK ON AIV AT NRLPD
2009-2016
<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log₂)¹</th>
<th>Virus isolation (Numbers)</th>
<th>PCR detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>56213</td>
<td>Punjab Sindh NWFP Baluchistan AJK, FANA, FATA, ICT</td>
<td>Vaccinated 3.6-10.0 (H7) 4.0-11.0 (H9) 3.4-8.7 (H5) Non-Vaccinated 0.00(H5) 0.00 (H7) 0.90 (H9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tissues</td>
<td></td>
<td>6783</td>
<td>-do-</td>
<td>-</td>
<td>AIV H9N2 (24)</td>
<td>H9N2 (18)  H9N2 (10)</td>
</tr>
<tr>
<td>Swabs</td>
<td></td>
<td>28390</td>
<td>-do-</td>
<td>-</td>
<td>AIV H9N2 (13)</td>
<td>Nil</td>
</tr>
<tr>
<td>Wild Birds &amp; Migratory birds</td>
<td>Feces, Blood</td>
<td>1480</td>
<td>-do- Sindh NWFP</td>
<td>2.0-6.0 (H9)</td>
<td>AIV H9N2 (2)</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Blood</td>
<td>542</td>
<td>-do- Sindh NWFP</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Swabs</td>
<td>586</td>
<td>-do- NWFP</td>
<td>3.4-7.0 (H9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blood</td>
<td>130</td>
<td>-do-</td>
<td>-</td>
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</table>

¹MT: Mean Titer, HI: Hemagglutination Inhibition, Ab: Antibody, PCR: Polymerase Chain Reaction,

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log2)</th>
<th>Virus isolation detection</th>
<th>PCR detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>39456</td>
<td>Punjab</td>
<td>Vaccinated</td>
<td>3.0-9.0 (H7)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sindh</td>
<td></td>
<td>3.5-9.5 (H9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NWFP</td>
<td></td>
<td>2.8-8.0 (H5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Baluchistan</td>
<td>Non-Vaccinated</td>
<td>0.00 (H5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AJK, FANA, FATA, ICT</td>
<td></td>
<td>0.00 (H7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-8.0 (H9)</td>
<td></td>
</tr>
<tr>
<td>Tissues Swabs</td>
<td></td>
<td>4781</td>
<td>-do-</td>
<td>H9N2 (19)</td>
<td>H9N2 (9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20120</td>
<td></td>
<td>H3N1 (1)</td>
<td>H9N2 (8)</td>
<td></td>
</tr>
<tr>
<td>Wild Birds</td>
<td>Feces, Blood</td>
<td>1240</td>
<td>-do-</td>
<td>H9N2 (19)</td>
<td>H9N2 (9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>350</td>
<td></td>
<td>H3N1 (1)</td>
<td>H9N2 (8)</td>
<td></td>
</tr>
<tr>
<td>Migratory birds</td>
<td>Swabs</td>
<td>416</td>
<td>Sindh</td>
<td>H4N6 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blood</td>
<td>144</td>
<td>NWFP</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MT: Mean Titer, HI: Hemagglutination Inhibition, Ab: Antibody, PCR: Polymerase Chain Reaction,
### CUMULATIVE SURVEILLANCE DATA FOR Avian Influenza Viruses
#### (January – December, 2011)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log₂)</th>
<th>Virus isolation PCR detection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Virus isolation (Numbers)</td>
</tr>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>41455</td>
<td>Punjab Sindh KPK Baluchistan AJK, NA, ICT</td>
<td><strong>Vaccinated</strong> 3.0-8.0 (H7) 3.5-9.0 (H9) 2.8-7.0 (H5) <strong>Non-vaccinated</strong> 0.00 (H5) 0.00 (H7) 0.0-9.0 (H9)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Tissues Swabs</td>
<td>6181</td>
<td>-do-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Swabs</td>
<td>22220</td>
<td>-do-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild Birds</td>
<td>Feces, Blood Swabs/ feces</td>
<td>1310</td>
<td>-do-</td>
<td>2.0 -6.0 (H9)</td>
<td>H9N2 (6) Nil</td>
</tr>
<tr>
<td>Migratory birds</td>
<td>Blood Swabs/ feces</td>
<td>250</td>
<td>Sindh KPK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MT:** Mean Titer, **HI:** Hemagglutination Inhibition, **Ab:** Antibody, **PCR:** Polymerase Chain Reaction,

**KPK:** Khyber Pakhtunkhwa, **AJK:** Azad Jammu & Kashmir, **ICT:** Islamabad Capital Territory, **NA:** Northern Areas
## CUMULATIVE SURVEILLANCE DATA FOR Avian Influenza Viruses
(January –December, 2012)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log₂)</th>
<th>Virus isolation PCR detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>31342</td>
<td>Punjab Sindh KPK Baluchistan AJK, NA, ICT</td>
<td>Vaccinated 2.0-8.0 (H7) 4.0-8.0 (H9) 2.0-7.0 (H5) Non-vaccinated 0.00 (H5) 0.00(H7) 0.0-9.6 (H9)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Tissues</td>
<td>7122</td>
<td>-do-</td>
<td>-</td>
<td>H9N2 (22)</td>
</tr>
<tr>
<td></td>
<td>Swabs</td>
<td>21002</td>
<td>-do-</td>
<td>-</td>
<td>H9N2 (14)</td>
</tr>
<tr>
<td>Wild Birds</td>
<td>Feces, Blood</td>
<td>1100 122</td>
<td>-do-</td>
<td>0.0 -5.0 (H9)</td>
<td>H9N2(4)</td>
</tr>
<tr>
<td>Migratory birds</td>
<td>Swabs/feces</td>
<td>101</td>
<td>Sindh KPK</td>
<td></td>
<td>Nil</td>
</tr>
</tbody>
</table>

MT: Mean Titer, HI: Hemagglutination Inhibition, Ab: Antibody, PCR: Polymerase Chain Reaction,

**CUMULATIVE SURVEILLANCE DATA FOR Avian Influenza Virus**  
(January –December, 2013)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log₂)</th>
<th>Virus isolation (Numbers)</th>
<th>PCR detection (Numbers)</th>
</tr>
</thead>
</table>
| Layer, Broiler, Breeder, Backyard | Blood | 6595 | Punjab, Sindh, KPK, Balochistan, AJK, GB, ICT | **Vaccinated**  
3.0-8.0 (H7)  
4.5-11.0 (H9)  
2.5-7.0 (H5)  
**Non-vaccinated**  
0.00(H5)  
0.00(H7)  
0.0-10.0 (H9) | | |
| | Tissues, Swabs | 4259, 7689 | -do- | | H9N2 (56), H9N2 (18) | |
| Wild Birds | Feces, Blood, Swabs | 335 | -do- | | AIV H14N3 (3) | |

MT: Mean Titer, HI: Hemagglutination Inhibition, Ab: Antibody, PCR: Polymerase Chain Reaction,  
## CUMULATIVE SURVEILLANCE DATA FOR Avian Influenza Viruses
(January – December, 2014)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log2)</th>
<th>Virus isolation PCR detection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Vaccinated</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.0-7.0 (H7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.0-11.0 (H9)</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>3.5-8.0 (H5)</td>
<td></td>
</tr>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>6678</td>
<td>Punjab Sindh KPK Balochistan AJK, GB, FATA, ICT</td>
<td>Non-vaccinated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tissues</td>
<td>1712</td>
<td>-do-</td>
<td></td>
<td>H9N2 (63)</td>
</tr>
<tr>
<td></td>
<td>Swabs</td>
<td>6668</td>
<td>-do-</td>
<td></td>
<td>H9N2 (42)</td>
</tr>
<tr>
<td>Wild Birds Migratory birds</td>
<td>Feces, Swabs</td>
<td>223</td>
<td>-do-</td>
<td></td>
<td>H9N2 (5)</td>
</tr>
</tbody>
</table>

**MT**: Mean Titer, **HI**: Hemagglutination Inhibition, **Ab**: Antibody, **PCR**: Polymerase Chain Reaction,

**KPK**: Khyber Pakhtunkhwa, **AJK**: Azad Jammu & Kashmir, **ICT**: Islamabad Capital Territory,

**GB**: Gilgit-Baltistan, **FATA**: Federally Administered Tribal Areas
## CUMULATIVE SURVEILLANCE DATA FOR Avian Influenza Viruses
(January –December, 2015)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log&lt;sub&gt;2&lt;/sub&gt;)</th>
<th>Virus isolation (Numbers)</th>
<th>PCR detection (Numbers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>8045</td>
<td>Punjab Sindh KPK Balochistan AJK, GB, ICT</td>
<td><strong>Vaccinated</strong> 3.5-8.5 (H7) 4.0-11.0 (H9) 3.5-8.5 (H5) <strong>Non-vaccinated</strong> 0.00 (H5) 0.00 (H7) 0.00-8.0 (H9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tissues Swabs others</td>
<td></td>
<td>3545</td>
<td>-do-</td>
<td></td>
<td>H9N2 (41)</td>
<td>H9N2 (29)</td>
</tr>
<tr>
<td>6421</td>
<td></td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild &amp; migratory Birds</td>
<td>Feces/swabs</td>
<td>187</td>
<td>-do-</td>
<td></td>
<td>H9N2(2)</td>
<td></td>
</tr>
</tbody>
</table>
# CUMULATIVE SURVEILLANCE DATA FOR Avian Influenza Viruses

(\textit{January –December, 2016})

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample Type</th>
<th># of samples</th>
<th>Location</th>
<th>MT range (HI Ab log$_2$)</th>
<th>Virus isolation (Numbers)</th>
<th>PCR detection (Numbers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer, Broiler, Breeder, Backyard</td>
<td>Blood</td>
<td>5730</td>
<td>Punjab, Sindh, KPK, Balochistan, AJK, GB, ICT</td>
<td>Vaccinated 4.5–8.5 (H7) 5.0–11.5 (H9) 3.5–8.0 (H5) Non-vaccinated 0.00 (H5) 0.00 (H7) 0.0–9.0 (H9)</td>
<td>H9N2 (32)</td>
<td>H9N2 (21)</td>
</tr>
<tr>
<td></td>
<td>Tissues</td>
<td>3633</td>
<td>-do-</td>
<td>-</td>
<td>H9N2(4)</td>
<td>H9N2(2)</td>
</tr>
<tr>
<td></td>
<td>Swabs</td>
<td>2262</td>
<td>-do-</td>
<td>0.00–6.00 (H9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>480</td>
<td>-do-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wild &amp; migratory Birds/LBM</td>
<td>Blood</td>
<td>172</td>
<td>-do-</td>
<td>0.00–6.00 (H9)</td>
<td>H9N2(4)</td>
<td>H9N2(2)</td>
</tr>
<tr>
<td></td>
<td>Tissues</td>
<td>142</td>
<td>-do-</td>
<td></td>
<td></td>
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</tr>
<tr>
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</tr>
<tr>
<td></td>
<td>Feces,</td>
<td>139</td>
<td>-do-</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Animals Camel Cat</td>
<td>Blood</td>
<td>78</td>
<td>-do-</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
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<tr>
<td></td>
<td>Tissues</td>
<td>03</td>
<td>-do-</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Swabs</td>
<td>37</td>
<td>-do-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2017 - H5N8 – HPAI – Poultry (domestic/back yard & commercial), Wild Birds

- Nepal H5N8; H5N1*
- Malaysia H5N1, poultry (28 Feb, 2017 outbreak after 10 years*)
- France H5N8 and LP H5N2; Czech Republic, Hungry, UK, Germany Ukraine, Romania (H5N8)
- Vietnam H5N1, H5N6, H5N1
- Slovakia (NI) HPAI H5, wild bird, 1st report
- Europe, Asia, H5N8, poultry, wild, spread
- Croatia HPAI H5N8, 1st report
- China H7N9 (Human new stain since 2013 – bird’s contact suspected as spreading factor);
- As of 20 April 2017, a total of 1393 laboratory-confirmed cases of human infection with avian influenza A(H7N9) viruses, including at least 534 deaths

*H5N1 continues to be reported by countries in South East Asia, such as Viet Nam, Laos, Cambodia, Indonesia, and Myanmar.
2016 - H5N8 – HPAI – Poultry (domestic/back yard & commercial), Wild Birds*

– Europe, Asia, Africa, Middle East (few had their 1st report)
– UK, France, Switzerland, Netherlands, Romania, Greece, Serbia, Hungary, Montenegro, Bulgaria, Russia;
– South Korea, Taiwan;
– India;
– United Arab Emirates (Abu Dhabi), Israel,
– Tunisia and Egypt

• OIE WAHIS indicates that since Jan 2014 to November 2016; AI identified in 77 countries with 13 strains detected killing domestic and wild birds and involved destruction of hundreds of million of domestic birds

* Source Promed
GLOBAL Situation - FAO EMPRES
H5N8 HPAI Update (Jan-2016)

• H5N8 highly pathogenic avian influenza (HPAI) 2016 virus in Africa, Asia, Europe and Middle East with pandemic potential

• Confirmed countries (virus was detected in poultry)
  – Austria, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Hungary, India, Iran (Islamic Republic of), Israel, the Netherlands, Nigeria, Poland, Russian Federation, Serbia, Sweden, the United Kingdom of Great Britain and Northern Ireland and Ukraine.

• Confirmed Countries (Virus in Wild birds)
  – Greece, Egypt, Finland, Ireland, Switzerland, Romania, Slovakia, Slovenia, Tunisia, Italy

• Reports of H5N8 HPAI events in Taiwan, a province of China, are not included in this update since the virus belongs to a genetically different strain.

• Number of human cases: None reported by Jan 2016.
Influenza at the human-animal interface
WHO Summary and assessment, 16 March to 20 April 2017

• **Avian influenza A(H5) viruses Current situation:**
  – Influenza A(H5) subtype viruses have the potential to cause disease in humans and thus far, no human cases, other than those with influenza A(H5N1) and A(H5N6) viruses, have been reported to WHO.
  – According to reports received by OIE, various influenza A(H5) subtypes continue to be detected in birds in Africa, Europe and Asia.

• **Avian influenza A(H7N9) viruses Current situation:**
  – During this reporting period, 86 laboratory-confirmed human cases of influenza A(H7N9) virus infection were reported to WHO from China.

• **Recently detected highly pathogenic avian influenza (HPAI) A(H7N9) viruses:**
  – As of 20 April 2017, a total of 1393 laboratory-confirmed cases of human infection with avian influenza A(H7N9) viruses, including at least 534 deaths, have been reported to WHO.
  – According to reports to FAO on surveillance, activities for avian influenza A(H7N9) viruses in China, positives among virological samples continue to be detected mainly from live bird markets, and some commercial and backyard farms.
Influenza at the human-animal interface Summary and assessment, (16 March to 20 April 2017)

WHO - Overall Risk Management Recommendations

• **Advice to Travellers:**
  – No special advice for traveller screening at points of entry or restrictions with regard to the current situation of influenza viruses at the human-animal interface.
  – Travellers in countries with known outbreaks of animal influenza should avoid farms, contact with animals in live animal markets, entering areas where animals may be slaughtered, or contact with any surfaces that appear to be contaminated with animal faeces.
  – Travellers should follow good food safety and good food hygiene practices.

• **Recommendations on safe trade in animals** from countries affected by these influenza viruses - OIE guidance/ Animal Health Codes

• **Recommendations to the National Governments:**
  • Due to the constantly evolving nature of influenza viruses, essentially follow clinical and laboratory surveillance and reporting
FAO Recommendations

• **Affected countries and those at risk:**
  – Intensified surveillance and awareness
  – Deal wild birds wisely not through culling or habitat destruction.
  – Spraying of birds or the environment with disinfectants could be potentially counter-productive, harmful to the environment and not effective from a disease control perspective.
  – Do not cull endangered species in zoological collections as pre-emptive measure
  – Control measures for captive wild birds in places where virus is detected should be based on strict movement control, isolation and only when necessary limited culling of affected birds.

• **General recommendations**
  – Report sick or dead birds -- both wild birds and poultry -- to local authorities and test for avian influenza viruses
  – Wash hands properly and often after handling birds or other animals, when cooking or preparing animal products, and before eating.
  – Eat only well-cooked meat products, and refrain from collecting, consuming or selling animals found sick or dead.
  – Seek immediate advice from your physician if you show signs of fever after being in contact with poultry, farmed birds, wild birds or other animals.
FAO Recommendations

• **Poultry producers**
  – Farmers and poultry producers should step up their biosecurity measures in order to prevent potential virus introduction from wild birds or their faeces.
  – It is important to keep poultry and other animals away from wild birds and their sub-products or droppings through screens, fencing or nets.
  – Commercial poultry operations and backyard poultry owners should avoid the introduction of pathogens through contaminated clothes, footwear, vehicles or equipment used in waterfowl hunting.

• **Hunters**
  – Hunting associations and wildlife authorities should be aware that H5N8 and other avian influenza viruses might be present in waterfowl hunted during fall migration 2016, and that hunting, handling, and dressing of shot waterfowl carries the risk of spreading avian influenza viruses to susceptible poultry.
  – Avoid introduction of avian influenza viruses to poultry through fomites (clothing, boots, vehicles, etc.) and do not feed wild bird scraps to poultry.
  – Water bird scraps should not be fed to domestic animals (cats, dogs, or poultry).
  – Any waste from hunted birds should be treated as potentially contaminated and safely disposed of.
FAO Recommendations

• **Recommendations to national authorities**
  
  – Increase surveillance efforts for the early detection of H5N8 and other influenza viruses in poultry and dead wild birds.
  
  – Provide means for reporting sick or dead birds, e.g. hotlines and collection points.
  
  – Raise awareness of the general population, poultry producers or marketers and hunters both about the disease as well as the reporting mechanisms for sick or dead birds.
  
  – Collaborate with hunting associations for laboratory testing of hunted birds, especially in areas that are known to be affected.
  
  – Provide means for and ensure proper disposal of carcasses after sample collection.
  
  – Ensure that the means for laboratory testing are in place to detect the currently circulating avian influenza viruses.
  
  – Gene sequencing should be performed for all H5 viruses detected and results shared with the global community in a timely manner. This will aid understanding of how the virus is spreading.
HPAI, A(H7N9) Virus Mutation and Risk to Humans*

- Genetic changes in A(H7N9) may have implications for poultry, to date, there is no evidence of increased transmissibility to humans or sustainable human-to-human transmission.

- In February 2017, a new A(H7N9) virus indicating high pathogenicity in poultry was detected in three patients connected to Guangdong, China, as well as in environmental and poultry samples. This is an important development to be monitored, however, the risk of the disease spreading within Europe via humans is still considered low, as there is no evidence of sustained human-to-human transmission.

- Since the notification of a novel reassortant influenza A(H7N9) virus on 31 March 2013, 1258 laboratory confirmed cases of human infection with avian influenza A(H7N9) virus have been reported. This is the fifth winter season in the northern hemisphere with human cases caused by A(H7N9) infections. During this wave, the number of human cases has been higher than in previous waves and accounts for 37% of the human cases reported so far. This is most likely due to greater environmental contamination in live bird markets and increased circulation of the virus among poultry.

- Threat posed by the increased number of human cases of avian influenza A/H7N9 is growing, and even though the human-to-human transmission potential has remained minimal, the number of human cases is much higher, and this avian virus could be the next pandemic threat.

*RSU – SAARC/ FAO/ WHO*
Thank you!