Impact on AI infections at humananimal interface a global perspective

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Current situation human infections with non-seasonal influenza

Confirmed A(H5N1) human cases reported to WHO

Number of Confirmed Human H5N1 Cases



3



A(H5N1) human activity since 2003



Areas with confirmed human cases for avian influenza A(H5N1) reported to WHO, 2003-2017*

*All dates refer to onset of illness Data as of 27 September 2017 Source: WHO/GIP The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or offis authorities, or concerning the delimitation of its fiontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. © World Health Organization 2016. All rights reserved.





A(H5) activity in birds 2017





A(H5) activity humans

2 new A(H5N1) cases 860 A(H5N1) cases/453 fatal 16 A(H5N6) cases/11 fatal





Confirmed H7N9 human cases reported to WHO as of 29 September 2017

Number of confirmed human H7N9 cases and deaths, as reported to WHO by week, as of 2017-9-18





CUMULATIVE CONFIRMED CASES OF INFLUENZA A(H7N9) 2013 - 2017 IN CHINA BY PROVINCE OF EXPOSURE













Confirmed cases by wave and region of exposure

	50 - 99
	>=100
	No data

 $\label{eq:wave1} \begin{array}{l} \mbox{Wave1}: 01/10/2012 - 30/09/2013 \\ \mbox{Wave2}: 01/10/2013 - 30/09/2014 \\ \mbox{Wave3}: 01/10/2014 - 30/09/2015 \\ \mbox{Wave4}: 01/10/2015 - 30/09/2016 \\ \mbox{Wave5}: since 01/10/2016 \\ \end{array}$

Disputed area Disputed borders

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Data source: World Health Organization. Map production: WHO Health Emergencies Programme © WHO 2017. All rights reserved. Map Date: 6/22/2017

A(H7) activity birds 2017





Other human infections with non-seasonal influenza since Sept 2016

Subtype	Country reporting	Cases	Clinical severity	Exposure
H7N2	USA	1	mild	To an infected cat.
H9N2	China	4	mild	2 with exposure to backyard poultry; 1 no clear exposure history
H1N1v	Italy, Switzerland, the Netherlands	3	2 severe, 1 mild	All 3 with swine exposure
H1N2v	USA	3	mild	All 3 had swine exposure
H3N2v	Canada USA	1 31	severe mild	All had swine exposure preceding illness



Impact of human infections with nonseasonal influenza

Impact

- Numbers of confirmed human infections remain relatively low
- Stressed surveillance systems
 - Investigation and contact follow up
 - On average, 21 and 18 contacts were traced for each A(H7N9) case in urban and rural areas respectively; compared to 90 and 63 for A(H5N1).

(Comparative epidemiology of human infections with avian influenza A(H7N9) and A(H5N1) viruses in China, B Cowling et al, Lancet. 2013 Jul 13; 382(9887): 129–137.)

- Scale up surveillance
- Cleaning of contaminated environments/closing of markets

High impact on food resources, stock markets, tourism.



Biggest fear: pandemic potential

Estimated mortality from 2009 pandemic:

- 123,000 and 203,000 pandemic influenza respiratory death (Simonsen et al, PloS med 2013, Nov 26)
- 201,200 respiratory deaths (range 105 700–395 600); (Dawood et al, Lancet)
- Estimated mortality from 1918 pandemic: 50 million deaths
- A severe pandemic could cost over 3 % of the global economy's gross national product, between one and two trillion dollars in the worst-case scenario. Sources: IMF, World Bank



Actions to reduce impact

One Health at WHO

To effectively detect, respond to, and prevent outbreaks of zoonoses and food safety problems, epidemiological data and laboratory **information should be shared** across sectors.

Government officials, researchers and workers across sectors at the local, national, regional and global levels should implement **joint responses** to health threats.

Strategic/policy collaborations with international agencies and partners

Technical collaborations with international agencies and partners

Disease-specific crosssectoral technical projects

http://www.who.int/zoonoses/activities/en/; http://www.who.int/features/qa/one-health/en/



World Health Organization

WHO actions in close collaboration with FAO/OIE

- Enhance early detection and risk assessment
 - TIPRA, monthly and ad hoc risk assessments.
 - Capacity building (under PIP framework and with other partners).
 - Longitudinal influenza Surveillance Network (LISN)
- Guidance and recommendations, if countries are experiencing infections with AI
- Pandemic Preparedness
 - GISRS and Candidate Vaccine Viruses
 - PIP framework
 - Research Agenda





Risk Assessment – TIPRA (Tool of Influenza Pandemic Risk Assessment)

10

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8

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4

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2

1

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2

Lowe

Higher

Moderate

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mpact

Influenza

Why TIPRA

- A <u>standardized</u> and <u>transparent</u> approach
- <u>Hazard</u> characterization, exposure ar context
- Identification of *gaps of knowledge*
- Risk question: What is the risk of human-to-human transmission of the virus?
 - Likelihood
 - Impact
- Nine risk elements risk stratification defined
- Multi-step approach

http://www.who.int/influenza/areas_of _work/human_animal_interface/tipra

International Contelence Al Northe 4 October 2017

Tool for Influenza Pandemic Risk Assessment (TIPRA)



Advance planning and preparedness help mitigate the impact of future pandemics. Risk assessment is critical to decide, clarify and justify public health preparedness, response and recovery actions. The Tool for Influenza Pandemic Risk Assessment (TIPRA) is used to assess the pandemic risk of influenza viruses with pandemic potential.

The objectives of TIPRA are to:

- support a timely and updatable hazard risk assessment for influenza viruses with pandemic potential;
- transparently document features of the viruses and the infections they cause that might pose threats to a human population;
- identify knowledge gaps and prompt further investigations including research and surveillance;
- facilitate information sharing between scientists, policy-makers and other stakeholders.

Highlights

Tool for Influenza Pandemic Risk Assessment (TIPRA) 14 July 2016

Report on Meeting to Launch TIPRA 4-5 May 2016

TIPRA Frequently Asked Questions, March 2017

Viet Nam Coordinated Surveillance for Influenza and Other Viruses with Pandemic Potential

terface:	Approach	Expected Outcome	
	Expand influenza virus characterization	Monitor virus diversity and evolution	
	Test existing specimens for other viruses with epidemic/pandemic potential	Understand the virological and epidemiolgical landscape	
	Share outputs across sectors for joint situation analysis and risk assessment	Inform response and control activities by providing-evidence base	

Two locations: based on high-risk market chains and confluence of human, livestock and wildlife influenza surveillance activities.

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GISRS

- Established in 1952
- Currently 143 National Influenza Centers (NICs) in 113 Member States
- 6 WHO Collaborating Centers
- 4 WHO Essential Regulatory Laboratories
- 13 WHO H5 reference laboratories, and ad hoc groups



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Data Source: Global Influenza Surveillance and Response System (GISRS), WHO Map Production: Global Influenza Programme World Health Organization World Health Organization



Updating of candidate vaccine strain viruses twice a year during Vaccine Composition Meeting





New candidate vaccine viruses

Influenza A(H3N2)v candidate vaccine viruses

Based on the available antigenic, genetic and epidemiologic data, a new CVV based on an A/Ohio/13/2017-like virus is proposed. The available A(H3N2)v CVVs are listed in Table 8.

Candidate vaccine viruses	Туре	Institution*	Available
A/Minnesota/11/2010 (NYMC X-203)	Conventional	CDC	Yes
A/Indiana/10/2011 (NYMC X-213)	Conventional	CDC	Yes
IDCDC PC55C (A/Obio/28/2016 like)	Conventional	NIBSC	pending
IDCDC-R055C (A/Onio/28/2010-like)	and reverse genetics	CDC	Yes
Candidate vaccine viruses in			
Preparation	Туре	Institution	Availability
A/Ohio/13/2017-like	Reverse genetics	CDC	pending

Table 8. Status of A(H3N2)v candidate vaccine virus development

* Institution distributing the candidate vaccine viruses:

CDC - Centers for Disease Control and Prevention, United States of America

NIBSC - National Institute for Biological Standards and Control, a centre of the Medicines and Healthcare products Regulatory Agency (MHRA), United Kingdom



Pandemic Influenza Preparedness (PIP) Framework

- Innovative Partnership that aims to increase global preparedness for pandemic influenza
- Brings together Member States, industry, civil society organizations, other partners and WHO to improve "on an equal footing":

Sharing of Influenza viruses with human pandemic potential with GISRS



Sharing of Benefits arising from virus sharing, e.g. vaccines, antivirals and other pandemic response products



Joint External Evaluation



The Joint External Evaluation Tool is intended to assess country capacity to prevent, detect, and respond to public health threats.

Countries can request a JEE mission to help them identify the most urgent needs within their health system.

The JEE will help engage with stakeholders and partners initiatives to support country outbreak and health emergency preparedness.

http://www.who.int/ihr/publications/WHO HSE GCR 2016 2/en/

Current zoonoses guide (2008)

Zoonotic Diseases: A Guide to Establishing Collaboration between Animal and Human Health Sectors at the Country Level



http://www.wpro.who.int/publications/docs/Zoonoses02.pdf

Developed jointly by animal health and public health sectors (WHO/OIE/FAO) Practical guidance on:

- Setting up a coordination mechanism
- Surveillance and information sharing
- Coordinated responses

Will be updated

- Planning and preparedness
- Joint risk assessment for specific threats
- Training and workforce development
- Risk communication



Areas for improvement

Rapid data and virus sharing (virus and sequence data)

- Including on LPAI and influenza circulating in the swine population.
- Linked databases (animal and human health, clinical outcomes and virology, ...)
- Joint investigations, risk assessment and communications at all levels.



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