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June 2012 COGR Meeting Thursday Afternoon Dual Use Presentation - Mellon

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H5N1 Merry-Go- Round

C&E News

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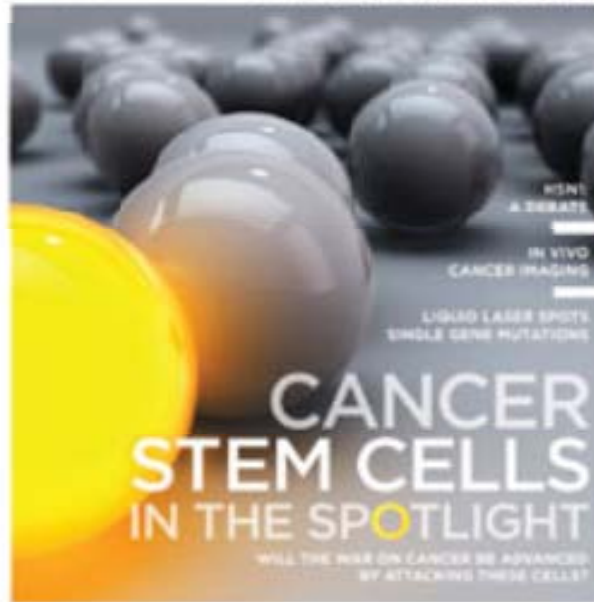
Professor of
Pharmaceutical
Sciences



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TheScientist

MAGAZINE OF THE LIFE SCIENCES



Deliberating Over Danger

The creation of H5N1 bird flu strains that are transmissible between mammals has thrown



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Timeline of Events, 2006/2011

- Call for proposal (NIAID) and grant submission
- UW-Madison Review [biosafety and dual use]
 - Institutional Biosafety Committee (IBC)
 - Biosecurity Task Force (BTF)
- NIH Funding/Research ongoing



The National Institute of Allergy and Infectious Diseases (NIAID), The Influenza Portfolio

- Report of the Blue Ribbon Panel on Influenza Research 2006 (similar to 2009 WHO Public Health Research Agenda for Influenza)

Influenza at the Animal-Human Interface

Scientific understanding of how animal and human influenza viruses interact, including how influenza viruses circulate among various reservoirs and the evolutionary pressures that lead to the emergence and spread of new viral subtypes, could be improved.

- Elucidate patterns of influenza virus diversity and evolution.
- Define patterns of influenza virus transmission in and between human and animal populations.

Examine interactions of diverse influenza viruses with various hosts.



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The National Institute of Allergy and Infectious Diseases (NIAID), The Influenza Portfolio

- **BIODEFENSE AND EMERGING INFECTIOUS DISEASE RESEARCH OPPORTUNITIES**
- This PA is intended to encourage the submission of investigator-initiated research grant applications in biodefense. The goal is to expedite research leading to the diagnosis, prevention and treatment of diseases caused by potential bioterrorism agents.



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Oversight of Select Agents at UW-Madison

- Responsible Official (RO)
- Biosecurity Task Force: oversight of all aspects of the program including PIs, facilities, biosecurity, and is advisory to the RO
- Institutional Biosafety Committee: Both AROs are consultants for SA proposals, facility issues, biosafety, biosecurity, etc.



Biosecurity Task Force

- Responsible for SA Program Oversight
- Membership:
 - RO (chair)
 - AROs, Director EHS, BSO
 - ADs for Research from 3 schools/colleges
 - State Lab Hygiene (PI)
 - [Vet Diagnostic Lab \(experienced PI\)](#)
 - UW Police
 - Attorney
 - [Director, Campus Information Security](#)
 - [Director, University Health Services](#)
 - UW Communications





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Courtesy of R. Moritz

BSL-3+

Personal change and shower room

Lockable doors

Interlocked Doors

Bioseals on interlocked double door
autoclaves

Independent air supply and exhaust (also
redundant *)

Visible means of displaying pressure
differential

Effluent Decontamination System *

Duct work prior to HEPA filter is pressure
decay tested

Backup power*



Courtesy of R. Moritz

BSL-3Ag

Facility is primary containment

Box within a box

Walls

Series of entry/exit rooms

Airlock doors

Facility and duct work is pressure decay tested

HEPA supply and double HEPA exhaust

Effluent Decontamination System

Isolator cages*

Gas decontamination of facility



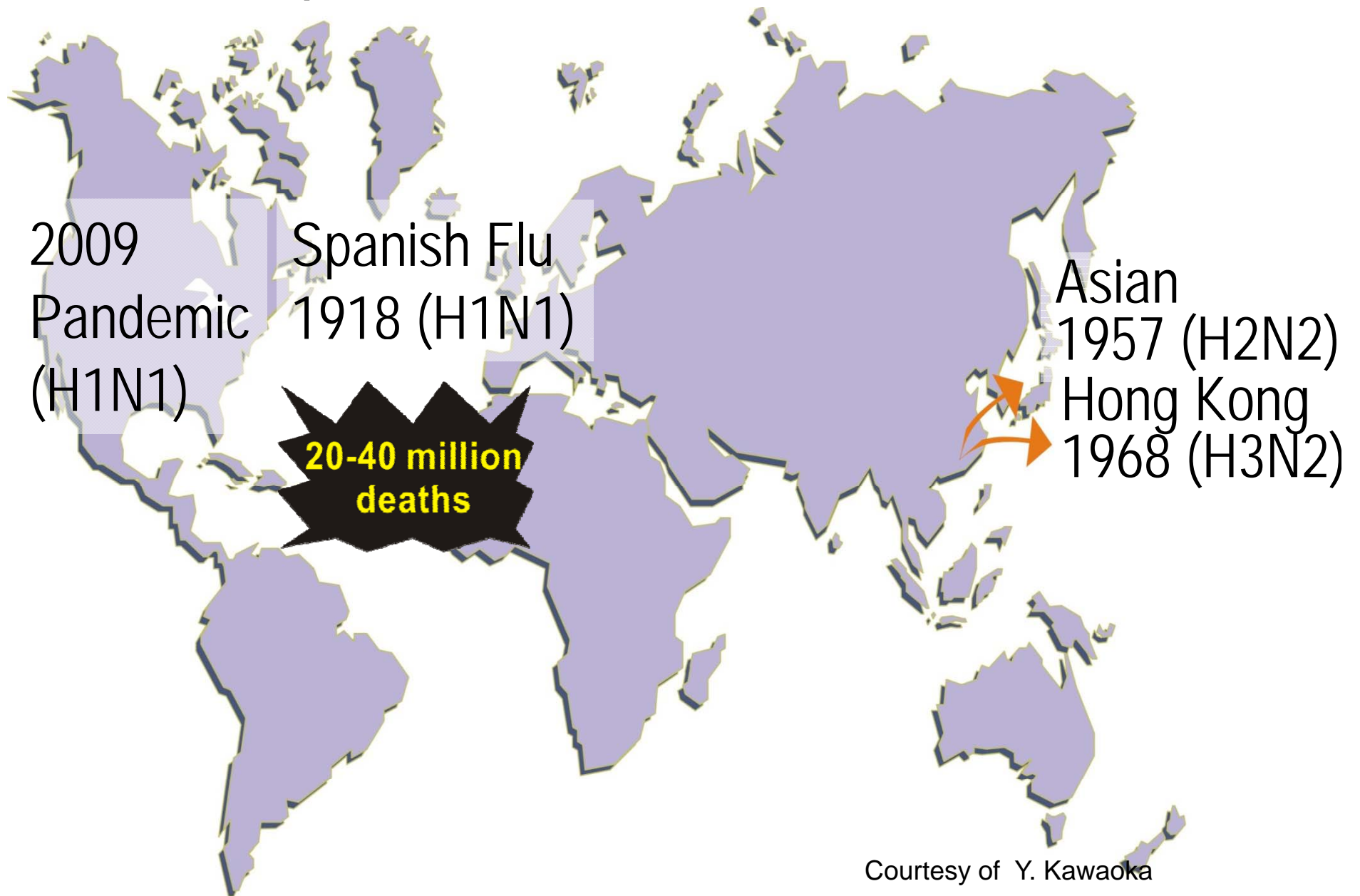
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Timeline of Events, 2006/2011

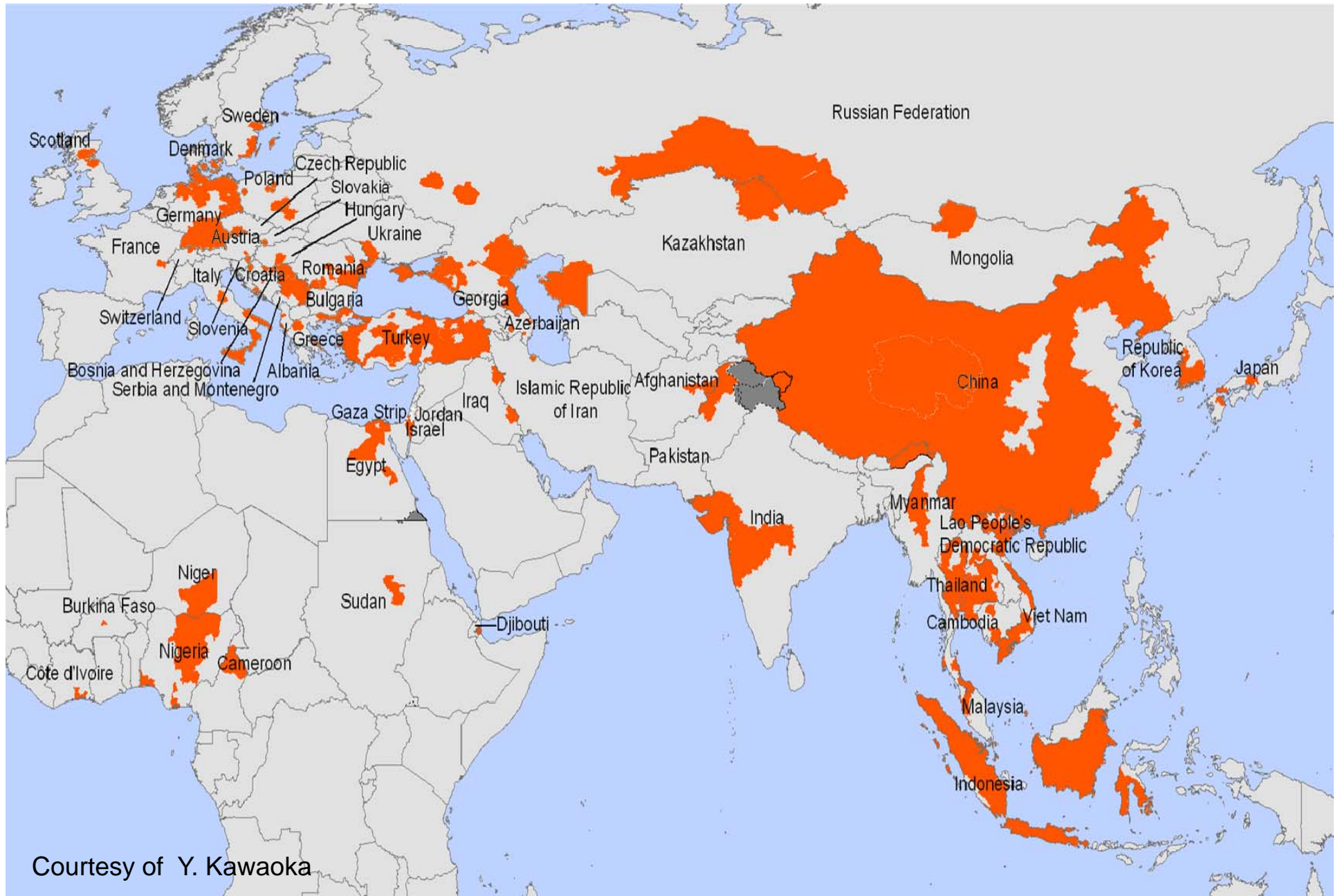
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Influenza pandemics of the 20th/21st centuries





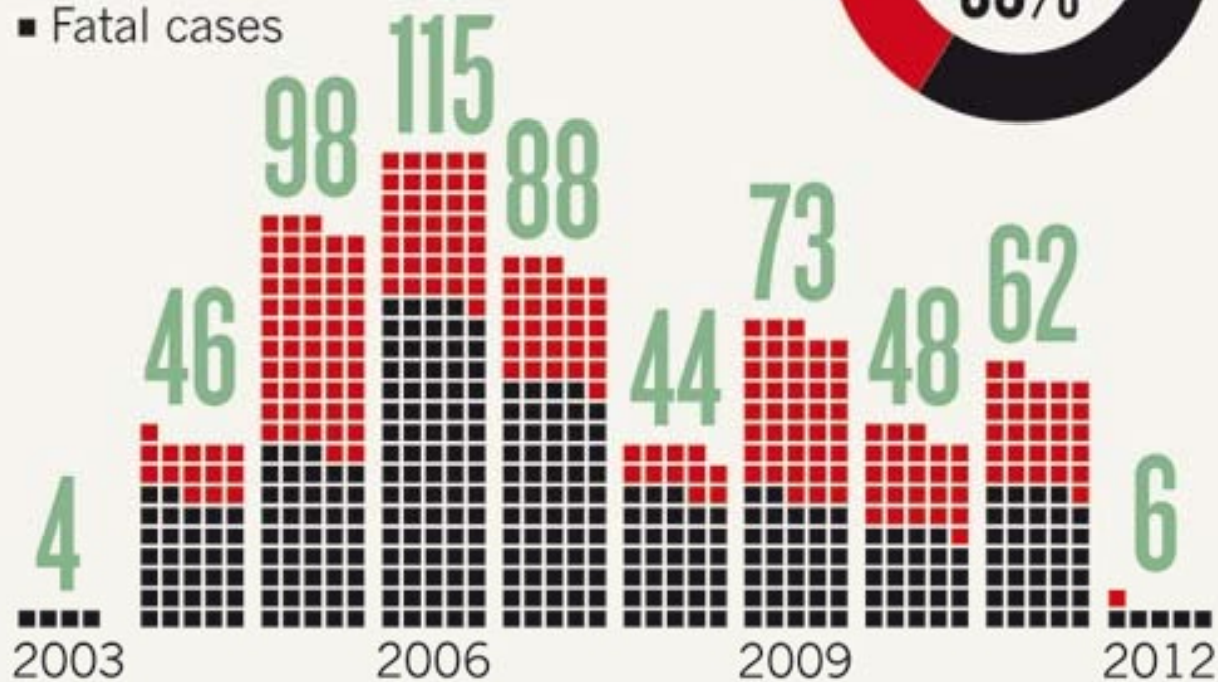
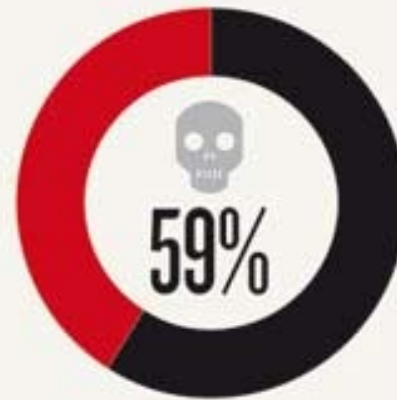


Courtesy of Y. Kawaoka

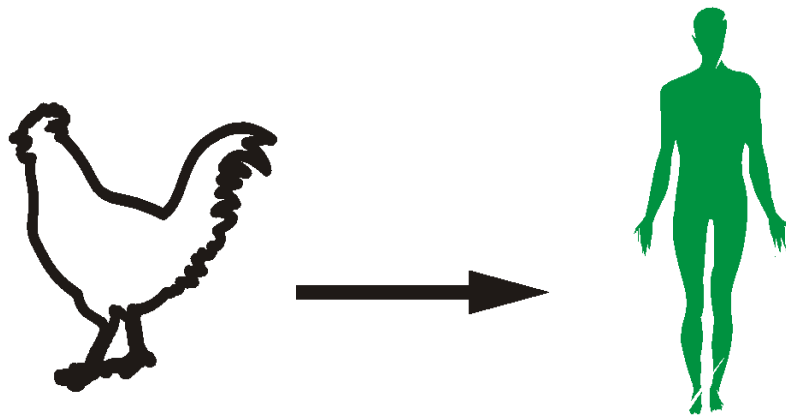
MORTAL DANGER

Since 2003, 584 confirmed cases of H5N1 flu have led to 345 deaths. (Numbers indicate total cases.)

- Non-fatal cases
- Fatal cases



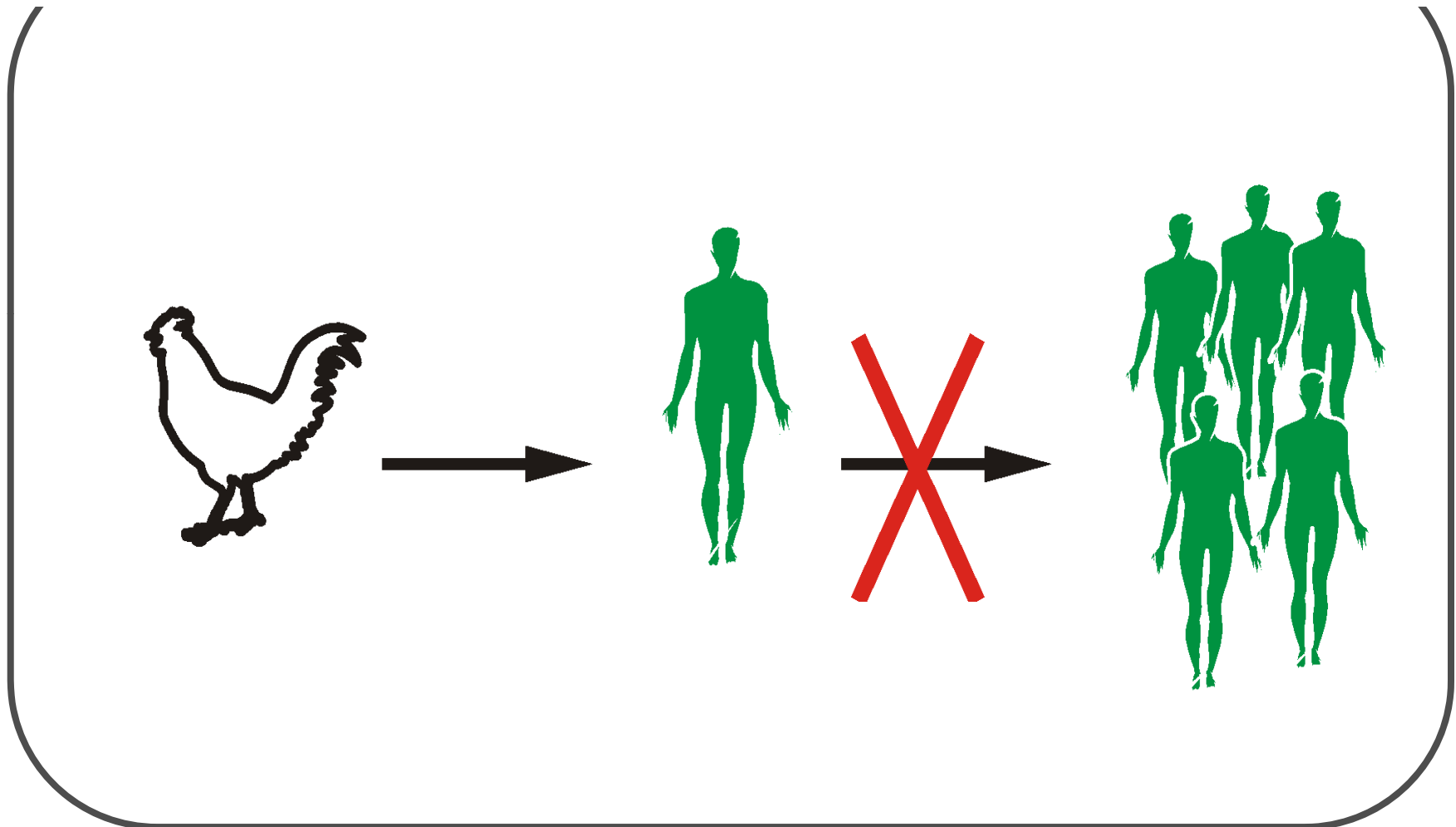
Transmission of H5N1 avian influenza virus to humans



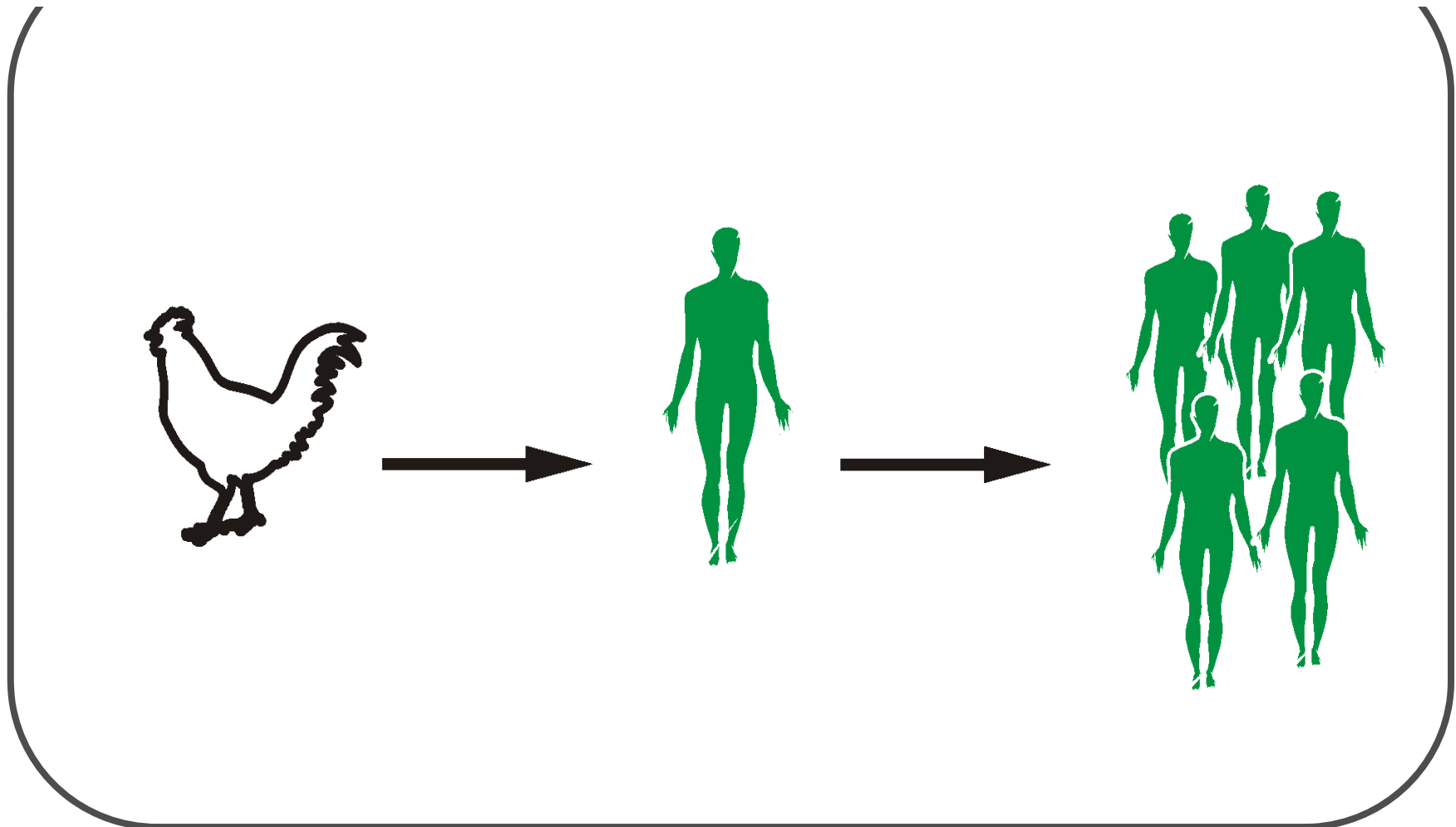
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Courtesy of Y. Kawaoka

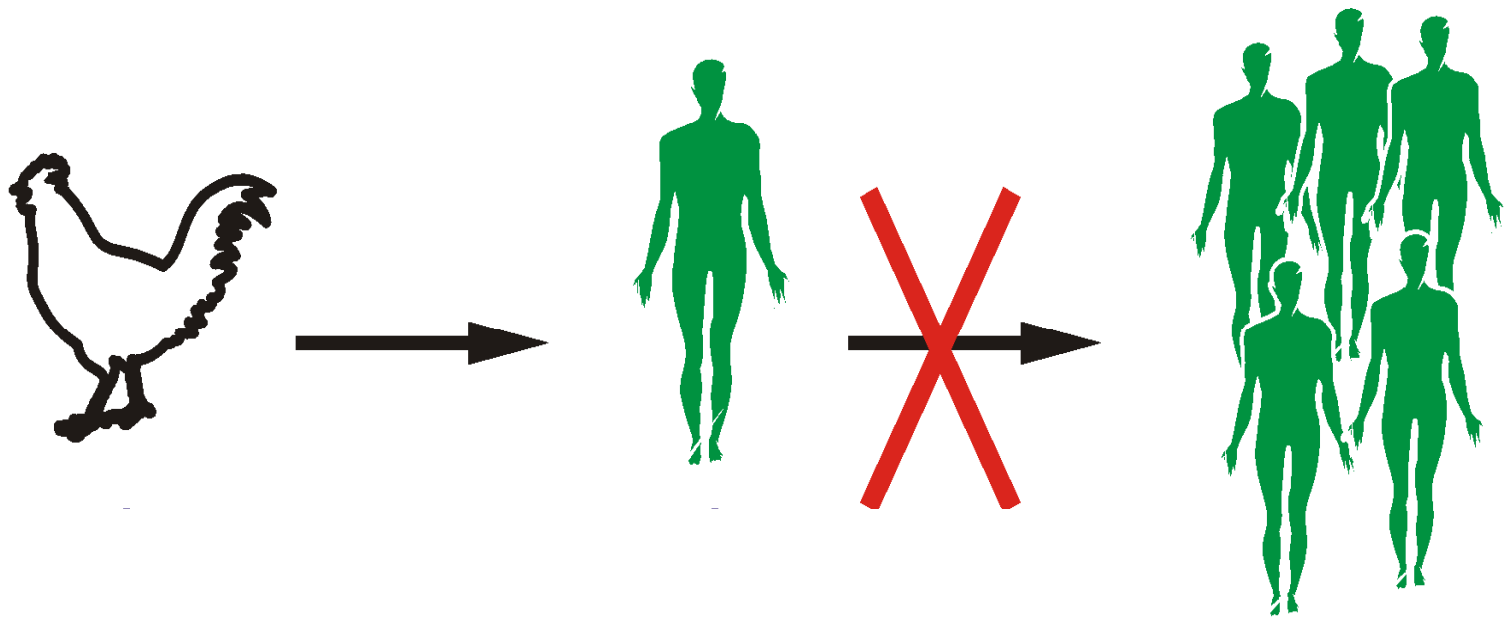
Transmission of H5N1 avian influenza virus to humans



Transmission of H5N1 avian influenza virus to humans



What would make bird flu virus transmissible in humans?



H5N1 virus



A(H1N1)pdm09



H5/pdm09

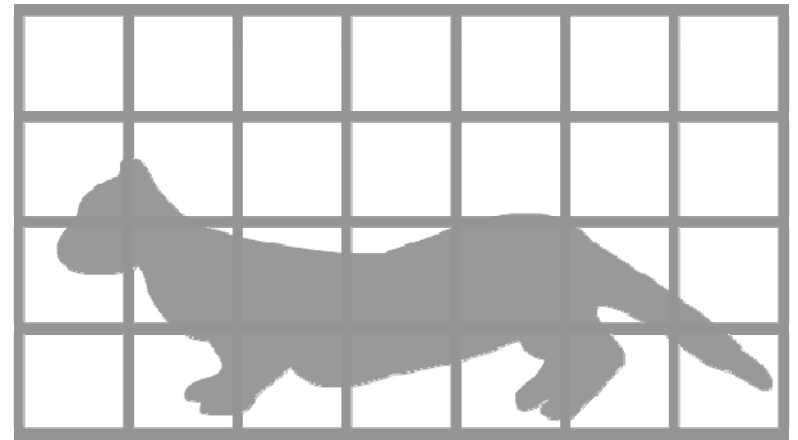
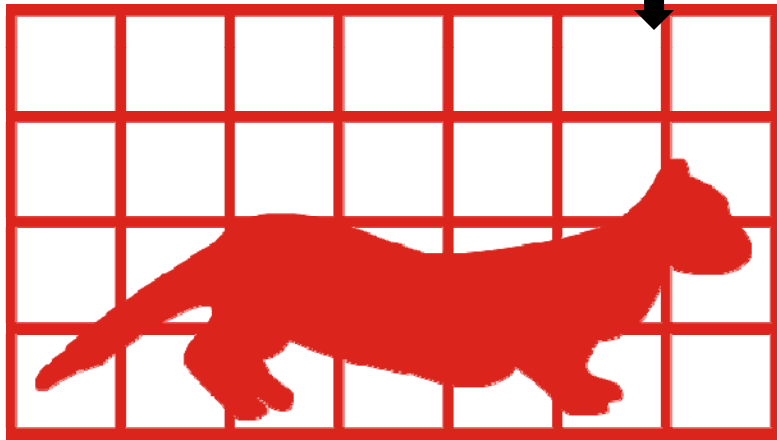
HA



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Courtesy of Y. Kawaoka

Transmission



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Courtesy of Y. Kawaoka

Results



No

transmission

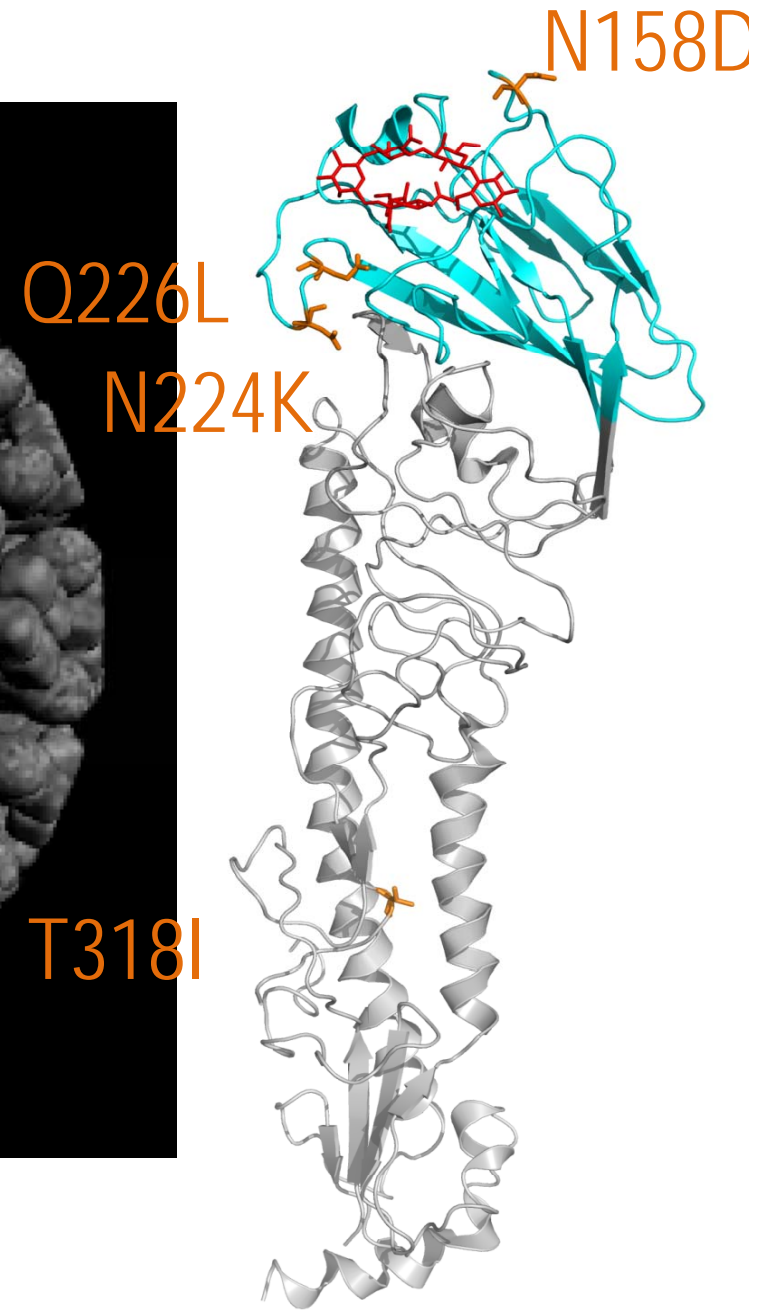
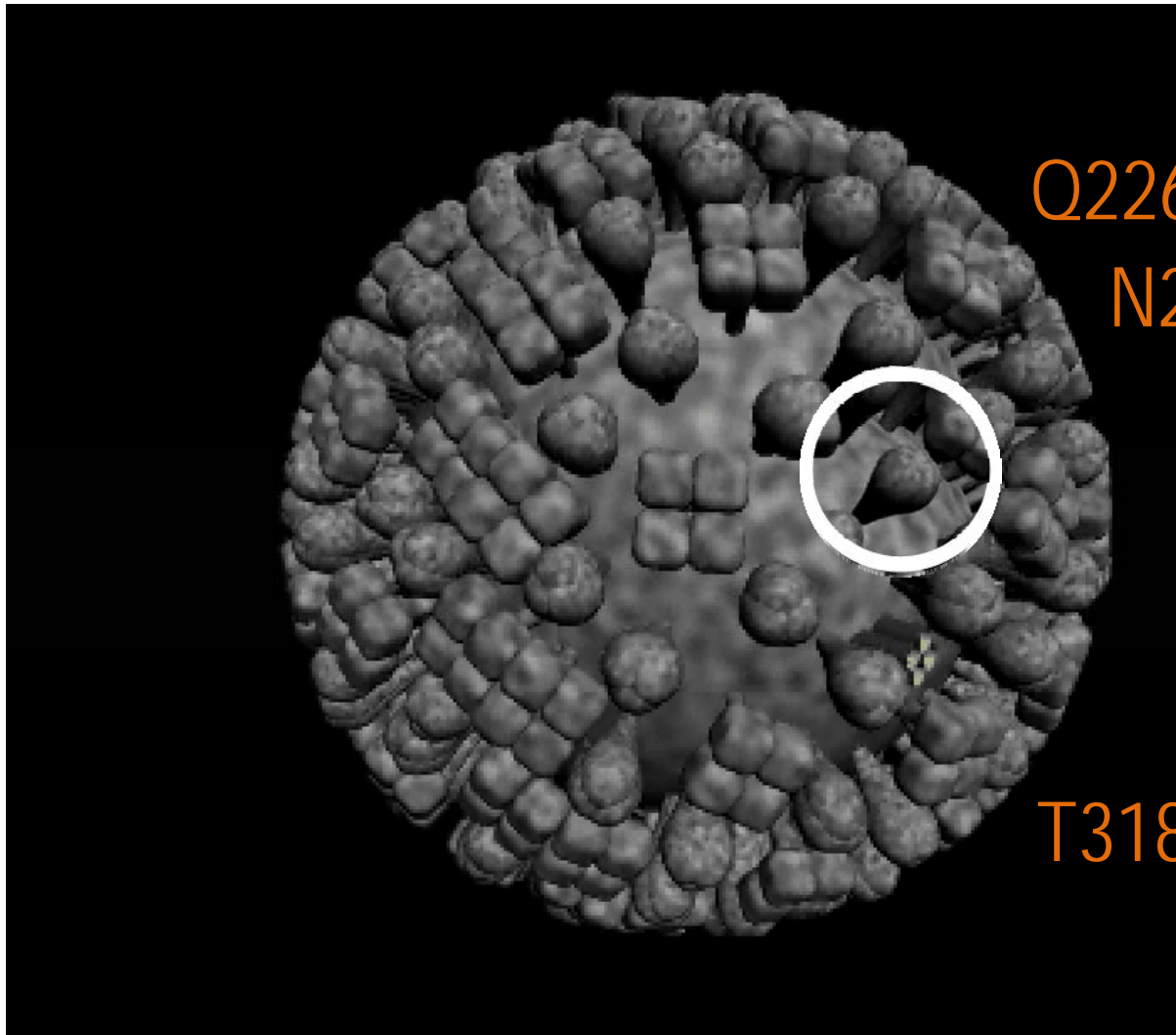


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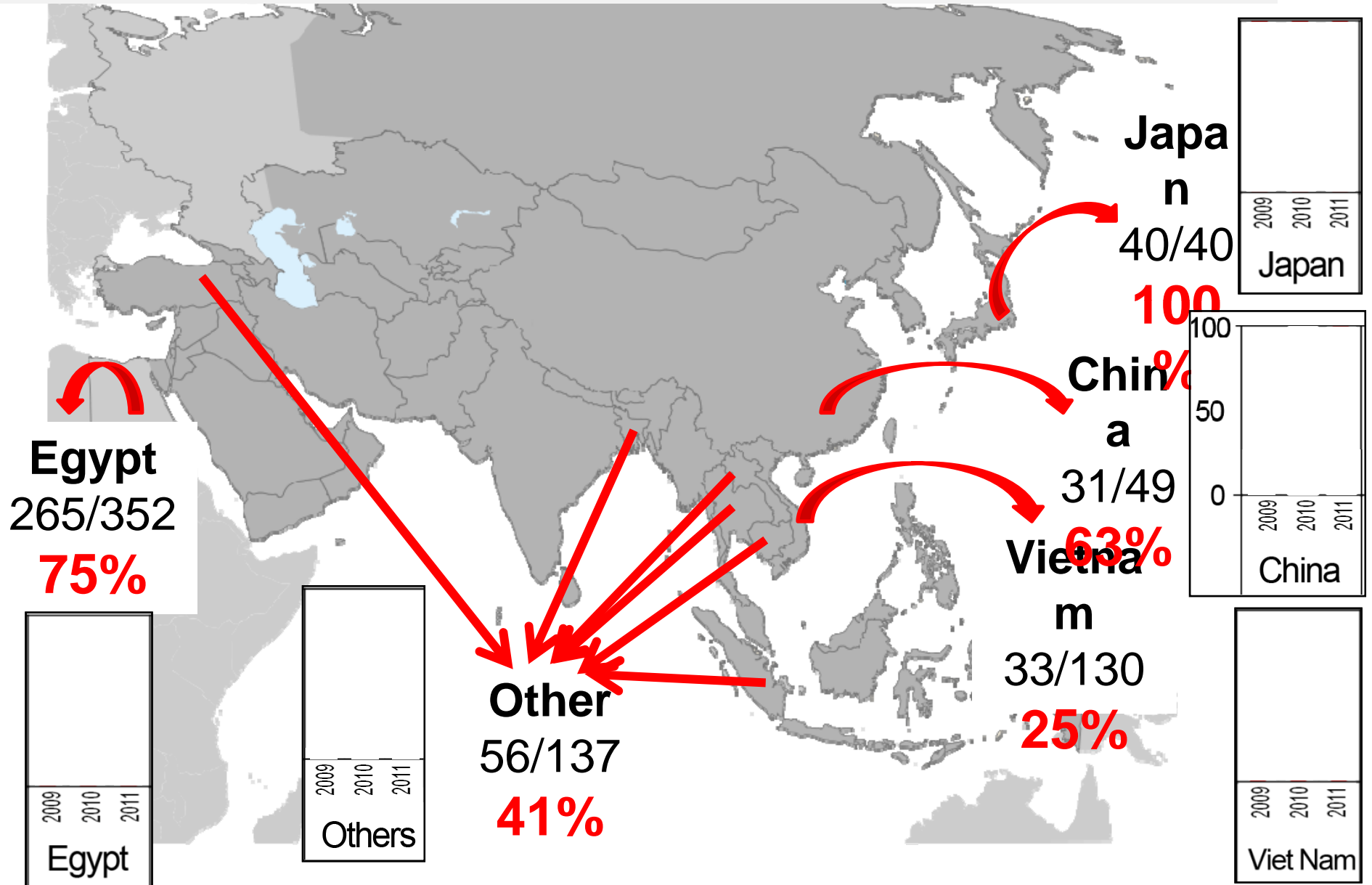
6/6 - transmission

Courtesy of Y. Kawaoka

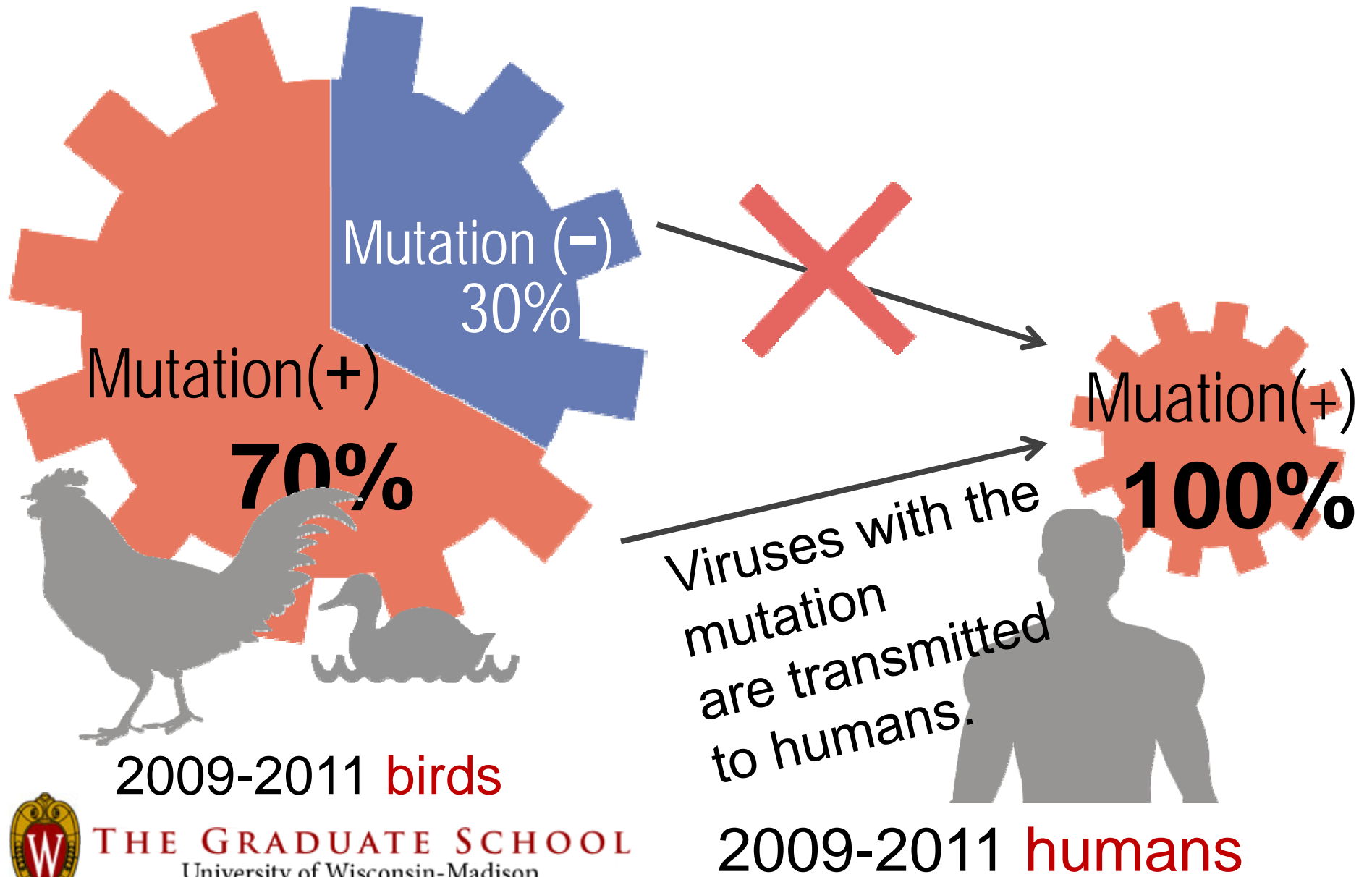


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Global incidence of the mutation among H5N1 isolates in 2009-2011



H5N1 viruses in Egypt



Timeline of Events, Continued 2011/2012

- Aug: Manuscript submitted
- Aug 30: Meeting with the Chancellor, et al.
- Sep 09: The Movie, Contagion



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Timeline of Events, Continued 2011/2012

- Sep 12: Fouchier announcement at Malta Conference
- Oct/Nov: NSABB review of manuscripts
- Dec: FBI begins engagement with UW-Madison on “bird flu”
- Dec 20: NSABB statement (**surprise and shock**)
- Jan 20: Kawaoka, Fouchier and 37 other Flu researchers publish statement and initiate a 60 day pause
- Jan 25: Kawaoka commentary
- Feb 16/17:WHO meeting (**the manuscript falls under Export Control!**)



Timeline of Events, Continued

2011/2012

- Feb 29: ASM biodefense and emerging disease conference
- March 29/30 – NSABB meets to review “revised” manuscripts
- March 29 – U.S. Policy for Oversight of Life Sciences DURC
- April 23 – Rep F. James Sensenbrenner (R-Wis) letters to OSTP Director John P. Holdren and NIH Director Francis S. Collins
- April – Increased scrutiny of DURC (refined at UW)
- May 2 – Nature publishes Kawaoka manuscript (enhanced and expanded biosafety/biosecurity methods)



Refining DURC Review at UW-Madison

- Researcher determination
- Researcher discussion with RO and ARO (**if SA**)
- Researcher discussion with IBC subcommittee
- Discussion of full-IBC and vote
- Discussion of BTF and vote
- UW-Madison acknowledgement/determination communicated to NIH



Stuff Happens!

SPEED BUMP

DAVE COVERLY



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