



# MI FluFocus

## Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology  
Bureau of Laboratories



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### ***New updates in this issue:***

- **Michigan Surveillance:** Influenza activity continues to hold steady at sporadic levels.
  - **National Surveillance:** Activity was stable or declining in most areas; may be rising in the Southeast.
  - **International Surveillance:** Many tropical countries see increasing or sustained high activity levels.
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### **\*\*\*2009 Influenza A (H1N1) virus Investigation\*\*\***

**Michigan (MDCH):** MDCH is no longer updating the table of confirmed and probable H1N1 cases by county. Instead, we have moved to aggregate flu reporting, which includes flu-like illness and confirmed and probable cases of seasonal and novel influenza. This report is updated every Tuesday by 5:00 pm and can be accessed at a link on this website: <http://www.michigan.gov/h1n1flu>. As of August 29, 3392 cases of flu-like illness and confirmed and probable cases of seasonal and novel influenza, including 10 deaths, were reported in Michigan.

On August 17, MDCH released new guidance for healthcare providers, laboratorians and public health personnel regarding appropriate patients and protocols for influenza testing at MDCH Bureau of Laboratories this fall. This guidance is attached to this MI FluFocus edition and can also be found on the MIHAN and at [http://www.michigan.gov/mdch/0,1607,7-132-2940\\_2955\\_22779\\_53388-214191--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_53388-214191--,00.html).

Please continue to reference the State of Michigan's novel 2009 influenza A (H1N1) website at [www.michigan.gov/h1n1flu](http://www.michigan.gov/h1n1flu) for additional information. Local health departments can find additional guidance documents in the MI-HAN document library. All State of Michigan influenza information can be found online at [www.michigan.gov/flu](http://www.michigan.gov/flu).

**National (CDC):** As of August 27, 2009, 4:00pm ET, the Centers for Disease Control and Prevention (CDC) is reporting 8843 hospitalizations and 556 deaths due to novel H1N1 influenza in the United States. CDC will report the total number of hospitalizations and deaths each week, and continue to use its traditional surveillance systems to track the progress of the 2009 influenza A (H1N1) flu outbreak. For the most up to date information, please visit the CDC's website at [www.cdc.gov/h1n1flu/](http://www.cdc.gov/h1n1flu/).

**International (WHO Pandemic Update 63 [edited], August 28):** In the southern hemisphere, most countries (represented by Chile, Argentina, New Zealand, and Australia) appear to have passed their peak of influenza activity and have either returned to baseline levels or are experiencing focal activity in later affected areas; while a few others (represented by South Africa and Bolivia) continue to experience high levels of influenza activity.

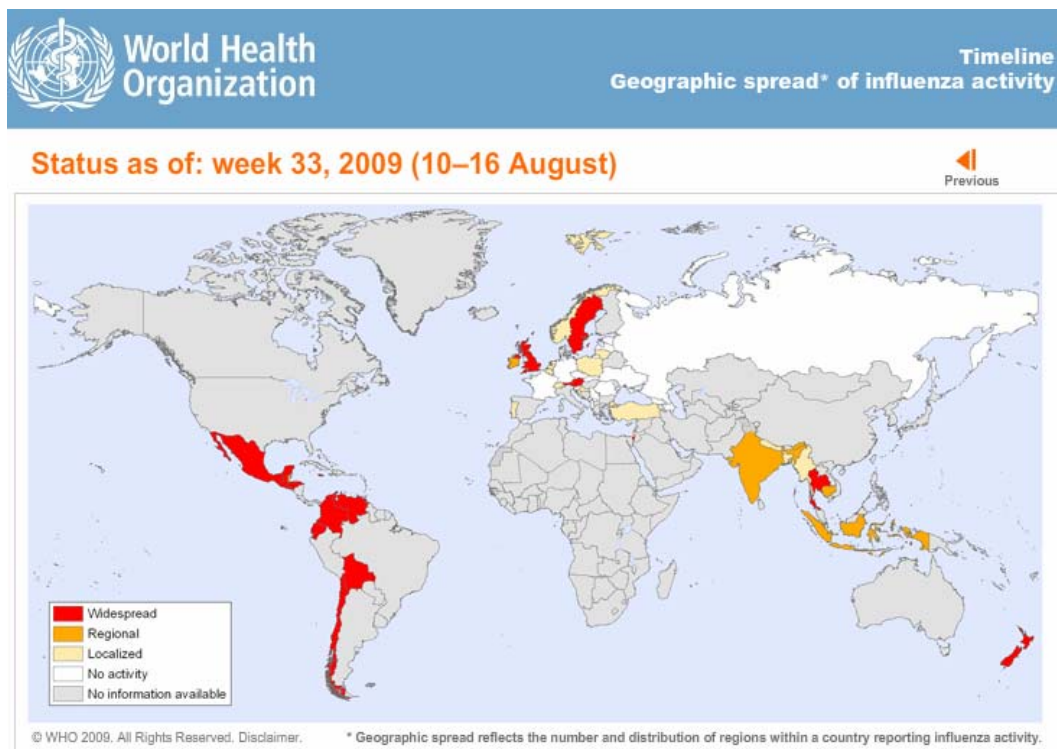
Many countries in tropical regions (represented by Central America and tropical regions of Asia), continue to see increasing or sustained high levels of influenza activity with some countries reporting moderate strains on the healthcare system. In temperate areas of the northern hemisphere (represented by North America, Europe, and Central Asia), influenza and respiratory disease activity remains low overall, with some countries experiencing localized outbreaks. In Japan, the level of influenza activity has passed the seasonal epidemic threshold, signaling a very early beginning to the annual influenza season.

Pandemic H1N1 influenza virus continues to be the predominant circulating strain of influenza, both in the northern and southern hemisphere. Antiviral susceptibility testing has increased in several countries, confirming that pandemic H1N1 influenza virus remains sensitive to the antiviral oseltamivir, except for sporadic reports of oseltamivir resistant pandemic H1N1 virus detailed in the previous web update (No. 62).

The countries and overseas territories/communities that have newly reported their first pandemic (H1N1) 2009 confirmed case(s) since the last web update (No. 62) as of 23 August 2009 are: Cameroon, Madagascar, and Mozambique.

Region	Cumulative total	
	as of 23 Aug 2009	
	Cases*	Deaths
WHO Regional Office for Africa (AFRO)	3843	11
WHO Regional Office for the Americas (AMRO)	110113	1876
WHO Regional Office for the Eastern Mediterranean (EMRO)	3128	10
WHO Regional Office for Europe (EURO)	Over 42,557	At least 85
WHO Regional Office for South-East Asia (SEARO)	15771	139
WHO Regional Office for the Western Pacific (WPRO)	34026	64
Total	Over 209438	At Least 2185

\*Given that countries are no longer required to test and report individual cases, the number of cases reported actually understates the real number of cases.



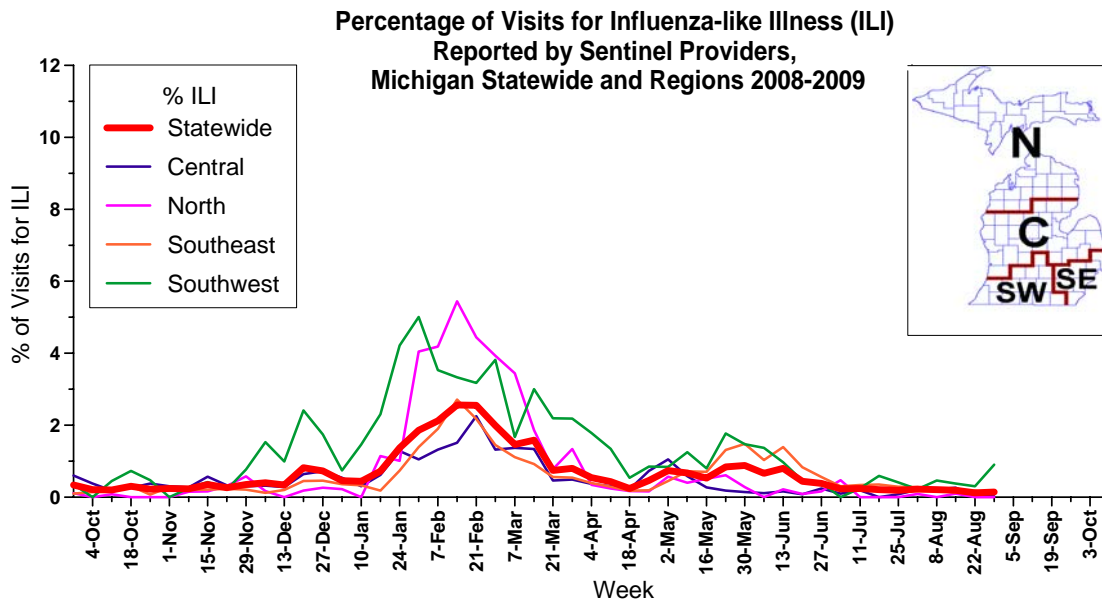
**Michigan Disease Surveillance System:** The week ending August 29 saw both aggregate flu-like numbers and individual influenza reports hold steady near baseline levels. Novel influenza reports also held steady near the previous week's numbers. Aggregate numbers are consistent with the numbers seen this time last year, while individual and novel influenza reports are slightly higher.

**Emergency Department Surveillance:** Emergency department visits from constitutional complaints saw a slight decline, while respiratory complaints increased slightly compared to the previous week's levels. Both constitutional and respiratory numbers are comparable to numbers seen at this time last year. Four constitutional alerts in the C(1), SE(1), and SW(2) Influenza Surveillance Regions and six respiratory alerts in the C(2), N(2), SE(1), and SW(1) Influenza Surveillance Regions were generated last week.

**Over-the-Counter Product Surveillance:** Overall, OTC product sales were mixed last week. Children's electrolytes saw a slight decline in sales over the previous week, while thermometer sales held steady. The remainder of the indicators saw a very slight increase in sales over the previous week's numbers. All indicator levels are comparable to those seen at this time last year.

**Sentinel Provider Surveillance (as of September 3):** During the week ending August 29, 2009, the proportion of visits due to influenza-like illness (ILI) remained the same compared to the previous week at

0.1% overall; 12 patient visits due to ILI were reported out of 8,353 office visits. Twenty-five sentinel sites provided data for this report. Activity increased in one surveillance region: Southwest (0.9%); remained the same in two surveillance regions: Central (0.0%) and North (0.0%); and decreased in the remaining surveillance region: Southeast (0.1%). Note that these rates may change as additional reports are received.



As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or [CarltonC2@michigan.gov](mailto:CarltonC2@michigan.gov) for more information.

**Laboratory Surveillance (as of September 3):** During the past week, no new seasonal influenza isolates were identified at the MDCH Bureau of Laboratories (BOL). For the 2008-2009 influenza season, MDCH BOL has identified 319 seasonal influenza isolates (followed by Influenza Surveillance Regions of origin):

- 188 A/H1N1 or A/H1 (63SE, 43SW, 25C, 57N)
- 12 A/H3N2 or A/H3 (5SE, 3SW, 1C, 3N)
- 119 B (24SE, 45SW, 14C, 36N)
  - 9 B/Florida/4/2006-like (4SE, 1SW, 1C, 3N)
  - 108 B/Malaysia/2506/2004-like (20SE, 43SW, 12C, 33N)
  - 1 untypable (SW)
  - 1 pending subtyping (C)

7 sentinel laboratories reported for the week ending August 29, 2009. 2 labs reported sporadic influenza A positives (SE,C), and 5 labs reported zero influenza A positives (SE, SW, C, N). 2 labs reported sporadic influenza B positives (SE), and 5 labs reported zero influenza B positives (SW, C, N).

**Michigan Influenza Antigenic Characterization (as of September 3):** 38 influenza seasonal A/H1N1 isolates have been antigenically characterized by the CDC; results indicate all seasonal isolates are A/Brisbane/59/2007-like, which matches the influenza A/H1N1 component of this season's Northern Hemisphere vaccine. One influenza A/H3N2 has been characterized as A/Brisbane/10/2007-like, which matches the A/H3N2 component of this season's vaccine.

9 Michigan pandemic influenza A (H1N1) specimens have been antigenically characterized by the CDC; all have been characterized as A/California/07/2009-like (H1N1)v. This strain is the variant reference virus selected by WHO as a potential candidate for pandemic influenza A(H1N1) vaccine.

20 influenza B isolates have been antigenically characterized by the CDC. 3 influenza B isolates have been characterized as B/Florida/4/2006-like, which matches the influenza B component of this season's vaccine. 17 influenza B isolates have been characterized as B/Brisbane/60/2008-like, which does not match this season's vaccine, but is a recommended component of the 2009-2010 vaccine.

**Michigan Influenza Antiviral Resistance Data (as of September 3):** 39 influenza seasonal A/H1N1 viruses from the MDCH Bureau of Laboratories have been tested for antiviral resistance at CDC for the 2008-2009 season. All 39 viruses were resistant to oseltamivir (Tamiflu®) and sensitive to zanamivir,

amantadine and rimantadine. These viruses were collected in the SE(15), SW(13), C(3) and N(8) Influenza Surveillance Regions. 4 influenza A/H3N2 isolates, collected in the C(2) and N(2) Regions, have been tested for antiviral resistance; these viruses were resistant to the adamantanes (amantadine and rimantadine) and sensitive to oseltamivir and zanamivir.

8 Michigan pandemic influenza A (H1N1) specimens have been evaluated by CDC for resistance to the adamantane class of antiviral medications; all specimens were resistant. 6 specimens were evaluated for resistance to oseltamivir and zanamivir; all were sensitive to these antivirals. For information about antiviral susceptibility for swine-origin influenza A (H1N1), go to <http://www.cdc.gov/h1n1flu/antiviral.htm>.

19 influenza B isolates, collected in the SE(8), SW(2), C(1) and N(5) Regions, have been tested for antiviral resistance; these viruses were sensitive to oseltamivir and zanamivir (the adamantanes are not effective against B viruses).

Antiviral resistance testing often takes several weeks to complete, and thus cannot be used to guide treatment of individual patients. However, CDC has made interim recommendations regarding the use of antiviral medications for the treatment of influenza and for prophylaxis. This guidance is available at <http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00279>.

**Seasonal Influenza-Associated Pediatric Mortality (as of September 3):** Three influenza-associated pediatric mortalities (1 influenza A (SW), 2 influenza B (SE)) have been reported to MDCH for the 2008-2009 influenza season.

\*\*\*The CDC has asked all states to collect information on any pediatric death associated with influenza infection. This includes not only any death in a child (<18 years) resulting from a compatible illness confirmed to be influenza by an appropriate diagnostic test, but also any unexplained death with evidence of an infectious process in a child. Please immediately call MDCH to ensure that proper clinical specimens are obtained. View the complete MDCH protocol online at [http://www.michigan.gov/documents/mdch/ME\\_pediatric\\_influenza\\_guidance\\_v2\\_214270\\_7.pdf](http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf).

**Influenza Congregate Settings Outbreaks (as of September 3):** Three congregate setting outbreaks (1C, 2N) due to seasonal influenza (1 influenza A, 1 influenza B, 1 untyped) have been reported to MDCH for the 2008-09 influenza season.

6 congregate setting outbreaks in Michigan associated with pandemic influenza A H1N1 have been reported to MDCH (1SE, 3SW, 1C, 1N).

**National (CDC [edited], August 28):** During week 33 (August 16-22, 2009), influenza activity remained stable or continued to decline in most areas of the U.S. However, activity appears to be increasing in the Southeast. A total of 8,843 hospitalizations and 556 deaths associated with 2009 influenza A (H1N1) viruses have been reported to CDC an increase from 7,983 hospitalizations and 522 deaths from the prior week. 804 (18.0%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. 99% of all subtyped influenza A viruses being reported to CDC were 2009 influenza A (H1N1) viruses. The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. Five influenza-associated pediatric deaths were reported and all were associated with a 2009 influenza A (H1N1) virus infection. The proportion of outpatient visits for influenza-like illness (ILI) was below the national baseline. Region IV reported ILI above their region-specific baseline. Two states and Puerto Rico reported geographically widespread influenza activity, 13 states reported regional influenza activity, 10 states and the District of Columbia reported local influenza activity, 24 states reported sporadic influenza activity, one state reported no influenza activity, and Guam and the U.S. Virgin Islands did not report.

CDC has antigenically characterized 2,110 seasonal human influenza viruses [1,189 influenza A (H1), 227 influenza A (H3) and 694 influenza B viruses] collected by U.S. laboratories since October 1, 2008, and 382 2009 influenza A (H1N1) viruses.

All 1,189 seasonal influenza A (H1) viruses are related to the influenza A (H1N1) component of the 2008-09 influenza vaccine (A/Brisbane/59/2007). Two hundred sixteen (95%) of 227 influenza A (H3N2) viruses tested are related to the A (H3N2) vaccine component (A/Brisbane/10/2007) and 11 viruses (5%) tested showed reduced titers with antisera produced against A/Brisbane/10/2007.

All 382 2009 influenza A (H1N1) viruses are related to the A/California/07/2009 (H1N1)pdm reference virus selected by WHO as a potential candidate for 2009 influenza A (H1N1) vaccine.

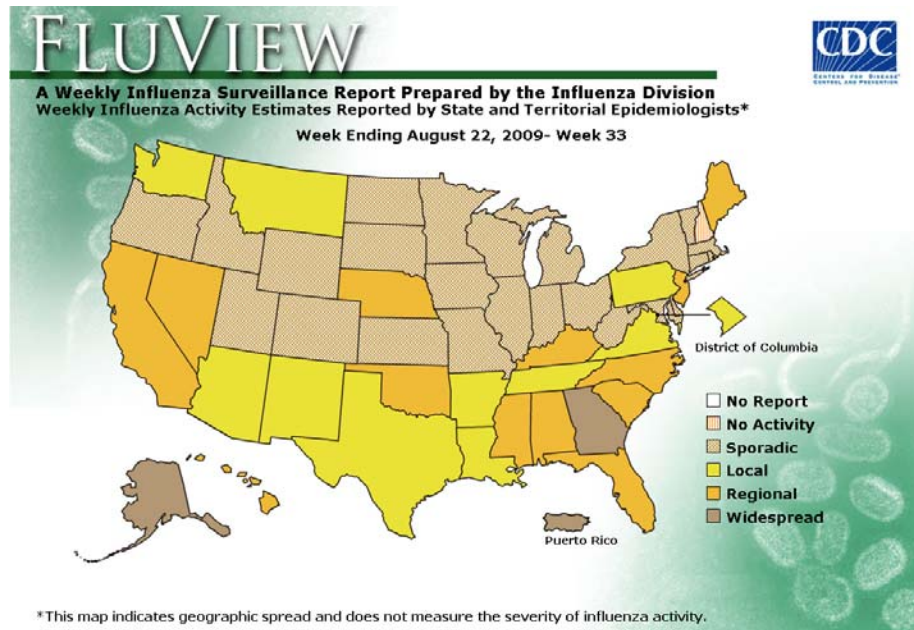
Influenza B viruses currently circulating can be divided into two distinct lineages represented by the B/Yamagata/16/88 and B/Victoria/02/87 viruses. Seventy-six (11%) of 694 influenza B viruses tested belong to the B/Yamagata lineage and are related to the vaccine strain (B/Florida/04/2006). The remaining 618 (89%) viruses belong to the B/Victoria lineage and are not related to the vaccine strain.

**Antiviral Resistance Testing Results:**

	Samples tested (n)	Resistant Viruses, Number (%)	Samples tested (n)	Resistant Viruses, Number (%)	Samples tested (n)	Resistant Viruses, Number (%)
		Oseltamivir		Zanamivir		Adamantanes
<b>Seasonal Influenza A (H1N1)</b>	1,148	1,143 (99.6%)	1,148	0 (0)	1,152	6 (0.5%)
<b>Influenza A (H3N2)</b>	253	0 (0)	253	0 (0)	252	245 (100%)
<b>Influenza B</b>	651	0 (0)	651	0 (0)	N/A*	N/A*
<b>2009 Influenza A (H1N1)</b>	1,022	6** (0.6)	426	0 (0)	433	433 (100%)

\*The adamantanes (amantadine and rimantadine) are not effective against influenza B viruses.

\*\*Two screening tools were used to determine oseltamivir resistance: sequence analysis of viral genes or a neuraminidase inhibition assay.



To access the entire CDC weekly surveillance report throughout the influenza season, visit <http://www.cdc.gov/flu/weekly/fluactivity.htm>

**International (WHO, August 7):** This summary provides an updated report of seasonal influenza activity. It does not include reports of avian influenza in humans, available at: [the WHO avian influenza page](#), or reports of the recent influenza A (H1N1) virus, available at: [the WHO page for influenza A\(H1N1\)](#).

During the weeks 29-30, the overall level of seasonal influenza activity decreased in the southern hemisphere. In Australia local activity occurred with H3 and H1 cocirculating. The predominant strain in New Zealand was still H1 with sporadic H3 viruses detected. Local outbreaks of influenza B were reported by Madagascar and Réunion. Influenza activity due to H3 in South Africa declined to local levels. In China Hong Kong Special Administrative Region, influenza activity due to H3 increased with some H1 and B also detected.

Sporadic seasonal influenza activity was observed in Cameroon (H3), Canada (B), Chile (H3), Côte d'Ivoire (H1,H3), French Guiana (H1,H3), Greece (A), Iran (H1,H3,B), Italy (H1,H3), Kenya (H1,B), Japan (H3), Morocco (H1), Norway (B), Republic of Korea (H3,B), Russian Federation (H1,H3,B), Tunisia (H3) and United States of America (H1,H3,B). Albania, Austria, Belgium, Bulgaria, Denmark, Estonia, Georgia,

Kazakhstan, Lithuania, Netherlands, Oman, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Sri Lanka, Turkey, Ukraine and United Kingdom reported no seasonal activity.

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MDCH reported **SPORADIC INFLUENZA ACTIVITY** to the CDC for the week ending August 29, 2009.

For stakeholders interested in additional information regarding influenza vaccination and education, the MDCH publication *Michigan FluBytes* is available online at [http://www.michigan.gov/mdch/0,1607,7-132-2940\\_2955\\_22779\\_40563-125027--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html). *FluBytes* is published weekly during the influenza season.

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### **Avian and Novel Influenza Activity**

**WHO Pandemic Phase:** Phase 6 – characterized by increased and sustained transmission in the general population. Human to human transmission of an animal or human-animal influenza reassortant virus has caused sustained community level outbreaks in at least two WHO regions.

**International, Human (WHO, August 31):** The Ministry of Health of Egypt has reported 2 new confirmed human case of avian influenza A(H5N1).

The first case is a 2 year-old female from Menofyia Governorate. Her symptoms started on 23 August. She was admitted to a fever hospital on 26 August, where she received oseltamivir treatment. The patient is in a stable condition.

The second case is an 14 year-old female from Damitta Governorate. Her symptoms started on 21 August. She was admitted to a fever hospital on 23 August, where she received oseltamivir treatment, and is in a stable condition.

Investigations into the source of infection indicated that both cases had close contact with dead and/or sick poultry.

The cases were confirmed by the Egyptian Central Public Health Laboratories.

Of the 85 cases confirmed to date in Egypt, 27 have been fatal.

**International, Avian (FAO AIDE update 61 [edited] via ProMed, August 31):** H5N1 AI occurrence during 2009. Note: This list has been compiled on the basis of information up to 31 Aug 2009.

August: Egypt, Mongolia

July: Indonesia

June: Bangladesh, Russian Federation, Viet Nam

May: China, India

April: China (Hong Kong)

March: Germany

February: Lao PDR, Nepal

**National, Research (National Institute of Allergy and Infectious Diseases, August 31):** Preliminary findings in ferrets suggest that the novel 2009 H1N1 influenza virus may outcompete human seasonal influenza viruses, researchers say. Tests in animals showed that levels of the 2009 H1N1 virus rose more quickly than levels of the seasonal virus strains, and the new virus caused more severe disease. In line with previous findings by other research groups, the University of Maryland researchers also observed that the novel H1N1 virus was transmitted more easily from infected to uninfected ferrets than either of the two seasonal influenza viruses.

The researchers found no evidence that the 2009 H1N1 virus combined with either of two seasonal flu viruses to form new, so-called reassortant viruses. These findings suggest that while 2009 H1N1 virus probably will predominate in the coming flu season, there may not be biological pressure for the new virus to re-combine with other circulating viruses, the researchers say.

The work was done by Daniel Perez, Ph.D., and colleagues from the University of Maryland. The researchers were supported by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health.

“This elegant study, conducted in a useful animal model of human influenza, provides important information about how the 2009 H1N1 influenza virus interacts with other flu virus strains,” says NIAID Director Anthony S. Fauci, M.D. “The results suggest that 2009 H1N1 influenza may outcompete seasonal flu virus strains and may be more communicable as well. These new data, while preliminary, underscore the need for vaccinating against both seasonal influenza and the 2009 H1N1 influenza this fall and winter.”

When the investigators inoculated ferrets with 2009 H1N1 virus plus either seasonal H1N1 virus or seasonal H3N2 virus, the animals became co-infected with both viruses. However, only the 2009 H1N1 virus was then transmitted from co-infected ferrets to uninfected ferrets; there was no evidence that either of the seasonal flu viruses were transmitted between co-infected and uninfected animals. “The H1N1 pandemic virus has a clear biological advantage over the two main seasonal flu strains and all the makings of a virus fully adapted to humans,” says Dr. Perez.

Next, the team conducted experiments to learn whether 2009 H1N1 virus would combine with seasonal flu viruses in co-infected animals to create new reassortant viruses. Some scientists have speculated that reassortant viruses may be more virulent or transmissible than either 2009 H1N1 or seasonal flu viruses alone. The researchers collected virus-containing material from the ferrets’ nasal cavities, but found no evidence of reassortment between the 2009 H1N1 and seasonal influenza strains, either in ferrets that were directly infected with both viruses or in ferrets that came in contact with the co-infected animals.

**Michigan Wild Bird Surveillance (USDA, as of September 3):** For the 2009 testing season (April 1, 2009 - March 31, 2010), HPAI subtype H5N1 has not been recovered from any of the 35 Michigan samples tested to date, including 26 live wild bird and 9 morbidity/mortality specimens. H5N1 HPAI has not been recovered from 6,036 bird or environmental samples tested nationwide for the 2009 season. For more information, visit the National HPAI Early Detection Data System at <http://wildlifedisease.nbio.gov/ai/>.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan’s Emerging Disease website at <http://www.michigan.gov/emergingdiseases>.

**Please contact Susan Peters at [VagaskyS@Michigan.gov](mailto:VagaskyS@Michigan.gov) with any questions regarding this newsletter or to be added to the weekly electronic mailing list.**

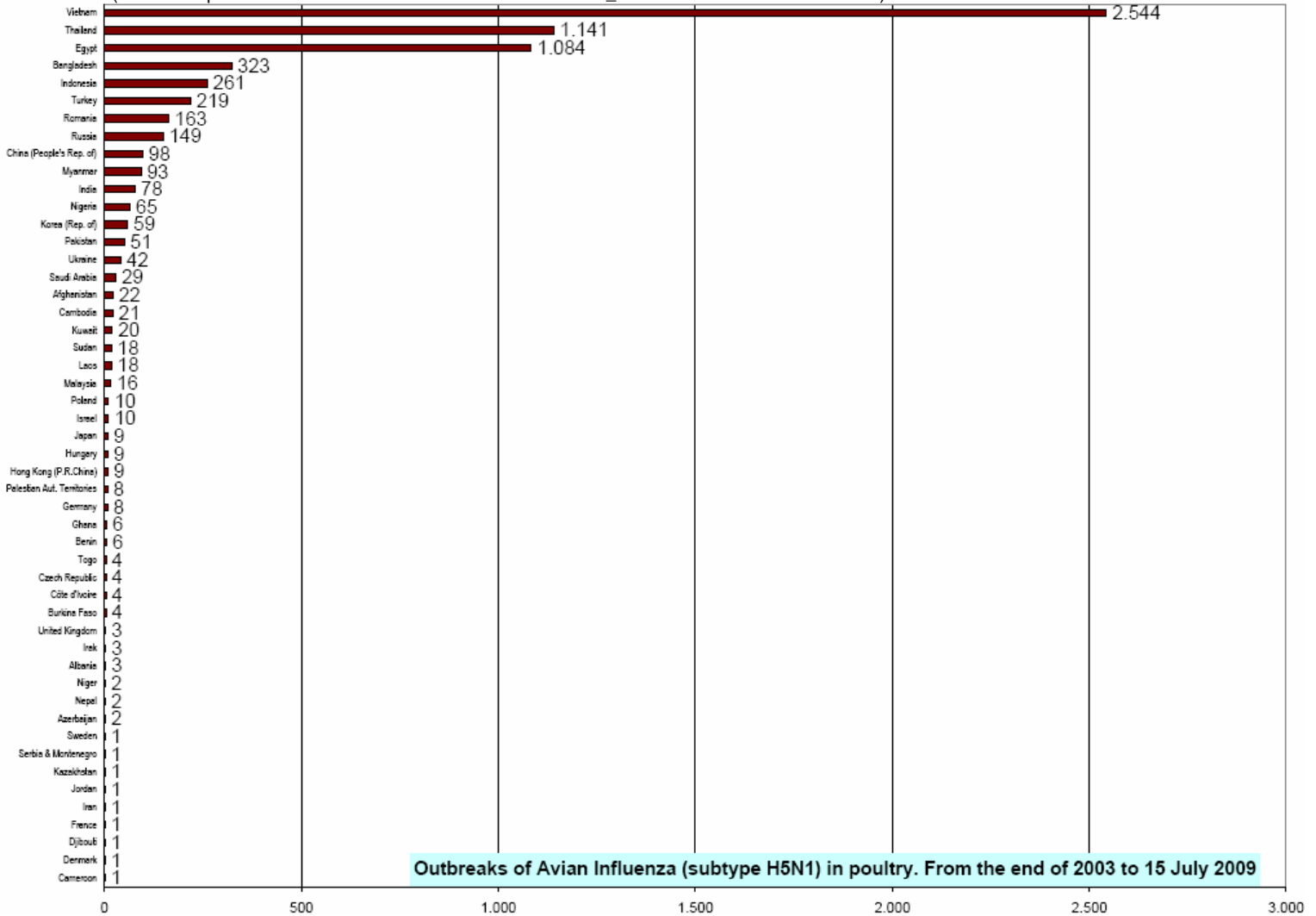
**Contributors**

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**Table 1. H5N1 Influenza in Poultry (Outbreaks up to July 15, 2009)**

(Source: [http://www.oie.int/downld/AVIAN%20INFLUENZA/A\\_AI-Asia.htm](http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm) Downloaded 8/3/09)



**Outbreaks of Avian Influenza (subtype H5N1) in poultry. From the end of 2003 to 15 July 2009**

**Table 2. H5N1 Influenza in Humans (Cases up to August 31, 2009)**

([http://www.who.int/csr/disease/avian\\_influenza/country/cases\\_table\\_2009\\_08\\_31/en/index.html](http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_08_31/en/index.html) Downloaded 8/31/2009)

Cumulative number of lab-confirmed human cases reported to WHO. Total number of cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	0	0	8	7
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	38	25
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	34	4	85	27
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	0	0	141	115
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	4	4	111	56
Total	4	4	46	32	98	43	115	79	88	59	44	33	45	12	440	262