MI FluFocus

Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology
Bureau of Laboratories

Michigan Department of Community Health
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May 28, 2009
Vol. 6; No. 21

New updates in this issue:

- **Michigan Surveillance:** Influenza activity continues to be elevated above baselines levels.
- **National Surveillance:** Novel A H1N1 viruses comprise the majority of influenza viruses circulating.
- **International Surveillance:** Over 13,000 cases of novel A H1N1 influenza have been identified.

******Novel Influenza A (H1N1) virus (Swine-origin Flu) Investigation******

Michigan (MDCH): As of May 28, 2009, 4:00pm, the Michigan Department of Community Health had confirmed 233 cases of swine-origin influenza A (H1N1) in Michigan. The MDCH Bureau of Laboratories is now able to perform confirmatory testing for this virus, so testing turnaround time is greatly reduced.

Please continue to reference the State of Michigan's swine-origin influenza A (H1N1) website at www.michigan.gov/swineflu for the most up to date case counts and additional information. Local health departments can find additional guidance documents on the MI-HAN homepage.

National (CDC): As of May 27, 2009, 11:00am, the Centers for Disease Control and Prevention (CDC) is reporting 7927 confirmed human infections, including 11 deaths, in the United States. These cases are being reported from 48 states and the District of Columbia. This number is expected to rise as the outbreak evolves and now that state public health laboratories have a diagnostic test to confirm swine-origin influenza A (H1N1) infections. For the most up to date information, including guidance documents, please visit the CDC's website at www.cdc.gov/h1n1flu/.

Novel influenza A (H1N1) is a new flu virus of swine origin that was first detected in April, 2009. The virus is infecting people and is spreading from person-to-person, sparking a growing outbreak of illness in the United States. An increasing number of cases are being reported internationally as well.

It's thought that novel influenza A (H1N1) flu spreads in the same way that regular seasonal influenza viruses spread; mainly through the coughs and sneezes of people who are sick with the virus.

Novel influenza A (H1N1) activity is now being detected through CDC's routine influenza surveillance systems and reported weekly in FluView. CDC tracks U.S. influenza activity through multiple systems across five categories. The fact that novel H1N1 activity can now be monitored through seasonal surveillance systems is an indication that there are higher levels of influenza-like illness in the United States than is normal for this time of year. About half of all influenza viruses being detected are novel H1N1 viruses.

International (WHO): As of 6:00 GMT, 27 May 2009, 48 countries have officially reported 13,398 cases of influenza A (H1N1) infection. Updated case counts and notices can be found online at http://www.who.int/csr/disease/swineflu/en/index.html.

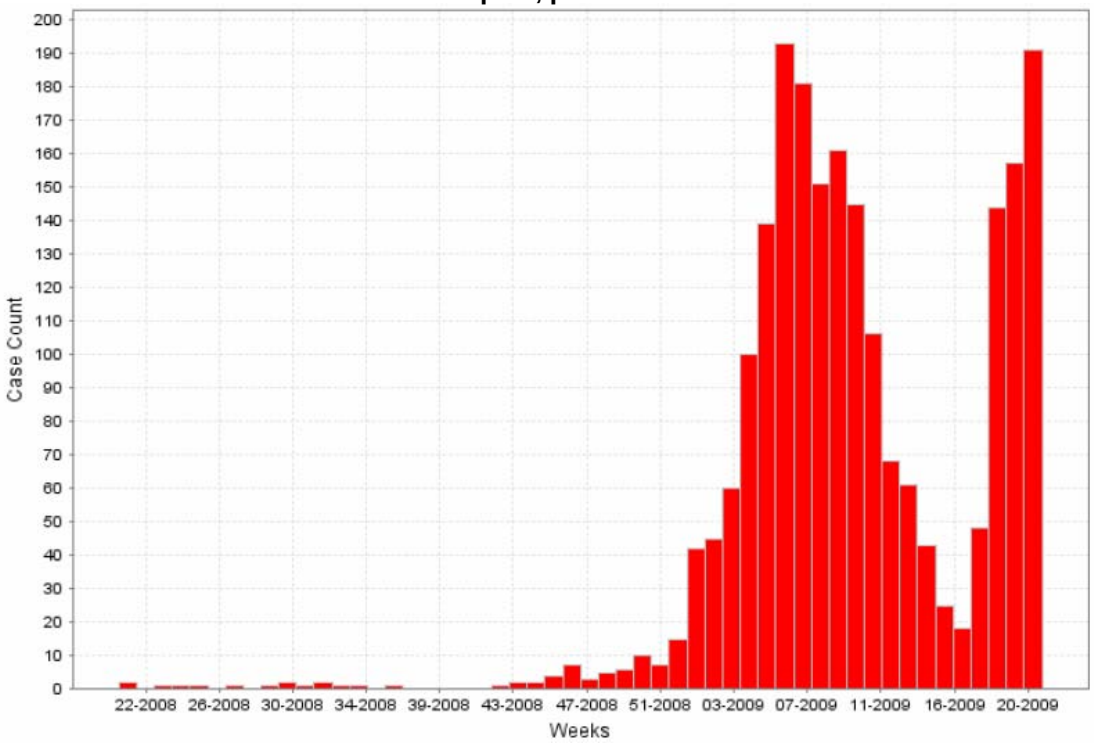
Michigan Disease Surveillance System: The week ending May 23 saw aggregate flu-like numbers drop slightly, and individual influenza reports increase, over the previous week's numbers. Both individual influenza and aggregate flu-like numbers are higher than numbers seen this time last year.

On the novel flu front, the week ending May 23 saw a slight increase in suspect, probable, and confirmed H1N1 cases in MDSS. As of May 28, Michigan has 233 confirmed of novel H1N1 influenza.

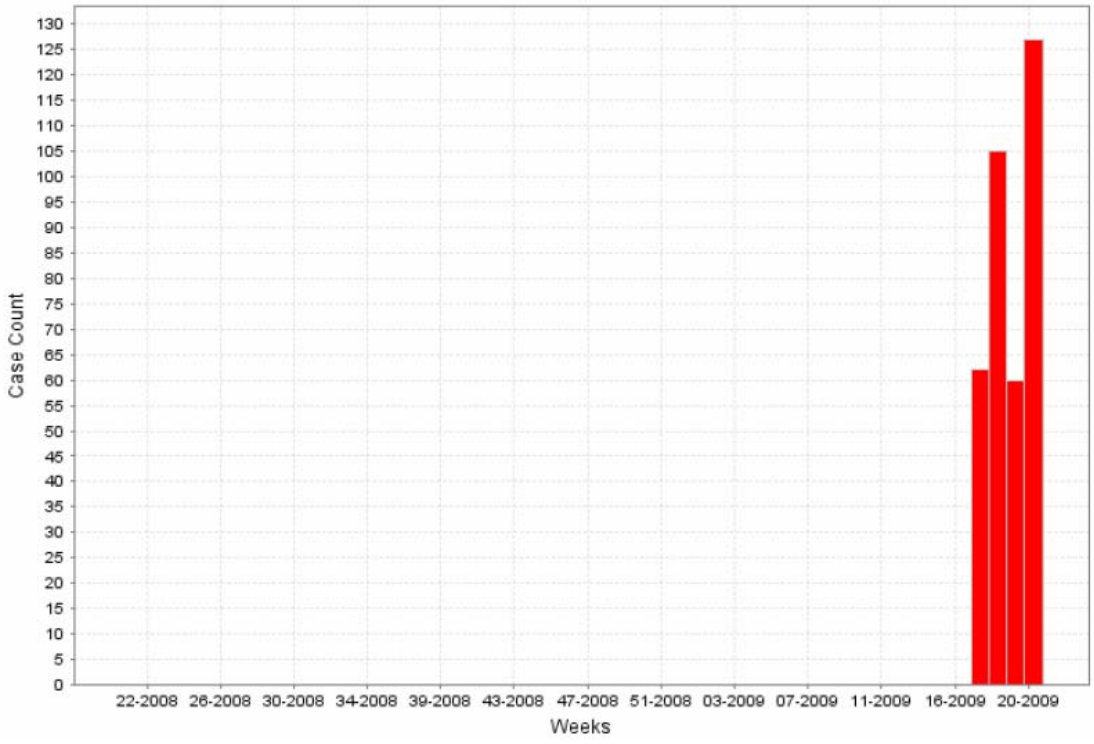
Emergency Department Surveillance: Emergency department visits from constitutional complaints increased, while respiratory complaints decreased from the previous week's levels. Respiratory numbers are comparable to numbers seen at this time last year, while constitutional numbers are considerably higher. Six constitutional alerts in the C(4) and SE(2) Influenza Surveillance Regions and one respiratory alert in the C(1) Influenza Surveillance Region were generated last week. The large increase in these ED visits is most likely due to patients, presenting with a range of mild to moderate respiratory symptoms including fever, who may be aware of the novel H1N1 virus that is circulating.

Over-the-Counter Product Surveillance: OTC product sales were mostly steady last week. All indicators remained steady overall, except chest rubs which saw a spike, followed by a mid-week dip, before returning to the previous week's levels. Indicator levels are comparable to those seen at this time last year, except for thermometers, which are slightly higher.

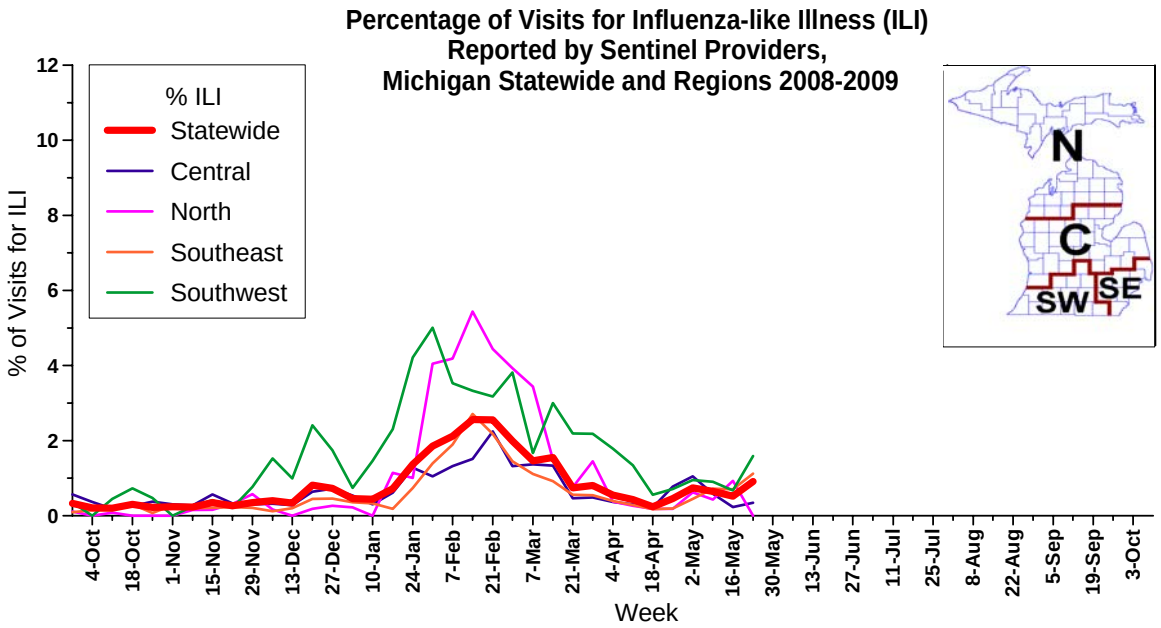
MDSS Individual Influenza Reports (Confirmed, Probable, Suspect, Unknown)
These counts do not include known suspect, probable or confirmed novel influenza infections



MDSS Novel Influenza Reports (Confirmed, Probable, Suspect, Unknown)



Sentinel Provider Surveillance (as of May 28): During the week ending May 23, 2009, the proportion of visits due to influenza-like illness (ILI) increased to 0.9% overall; 64 patient visits due to ILI were reported out of 7,013 office visits. Twenty-eight sentinel sites provided data for this report. The increased level of ILI activity may be an indication of novel influenza A (H1N1) circulation, or this finding may also be due to an increase in the number of patients seeking care for ILI. Activity increased in three of the surveillance regions: Central (0.3%), Southeast (1.1%) and Southwest (1.6%); and decreased in the North (0.0%) region. Note that these rates may change as additional reports are received.



As part of pandemic influenza preparedness, 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 for more information.

Laboratory Surveillance (as of May 28): 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 314 seasonal influenza isolates (followed by Influenza Surveillance Regions of origin):

- 186 A/H1N1 or A/H1 (62SE, 43SW, 25C, 56N)
- 9 A/H3N2 or A/H3 (4SE, 2SW, 1C, 2N)
- 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)

For the week ending May 16, 9 sentinel laboratories provided data. Activity was mixed, with 4 labs (SE,C) reporting increased positive influenza A results and 5 labs (SE, SW, C, N) reporting decreasing or zero positive influenza A results. The increase in positive results for influenza A may be an indication of swine-origin influenza A (H1N1) circulation, or this finding may also be due to an increased interest in influenza testing. All labs reported zero or sporadic influenza B positives (SE, SW, C, N).

Michigan Seasonal Influenza Antigenic Characterization (as of May 28): At this time, 24 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.

At this time, 3 influenza B isolates have been antigenically characterized by the CDC. One influenza B isolate has been characterized as B/Florida/4/2006-like, which matches the influenza B component of this season's vaccine. Two 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 Seasonal Influenza Antiviral Resistance Data (as of May 28): 24 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 24 viruses were resistant to oseltamivir (Tamiflu®) and sensitive to zanamivir, amantadine and rimantadine. These viruses were collected in the SE(11), SW(12) and N(1) Influenza Surveillance Regions. One influenza A/H3N2, collected in the C Region, has been tested for antiviral resistance; that virus was resistant to the adamantanes (amantadine and rimantadine) and sensitive to oseltamivir and zanamivir. Two influenza B isolates, collected in the SW Region, 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.

For information about antiviral susceptibility for swine-origin influenza A (H1N1), go to http://www.cdc.gov/h1n1flu/antiviral.htm.

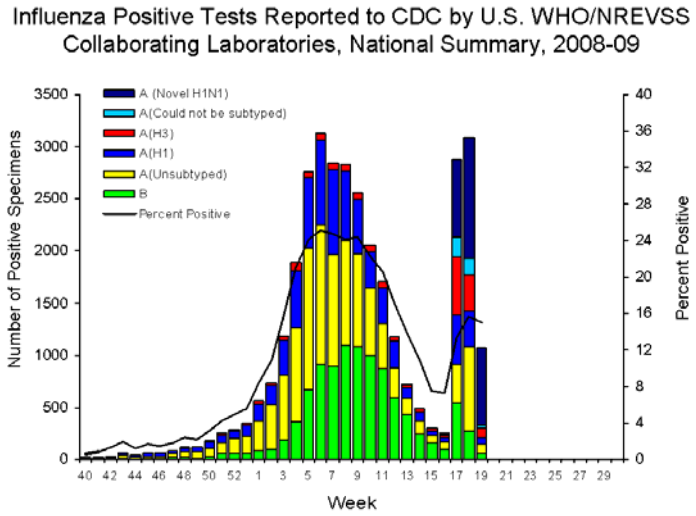
Seasonal Influenza-Associated Pediatric Mortality (as of May 28): Three influenza-associated pediatric mortalities (1 influenza A (SW), 2 influenza B (SE)) have been reported to MDCH for the 2008-2009 influenza season.

***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.

Seasonal Influenza Congregate Settings Outbreaks (as of May 28): Three congregate setting outbreaks (1C, 2N) due to seasonal influenza (1 influenza A, 1 influenza B, 1 unsubtyped) have been reported to MDCH for the 2008-09 influenza season.

National (CDC [edited], May 22): During week 19 (May 10 - 16, 2009), influenza activity decreased in the United States, however there are still higher levels of influenza-like illness than is normal for this time of year. One thousand seventy-four (15.1%) 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. The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. Two influenza-associated pediatric deaths were reported. The proportion of outpatient visits for influenza-like illness (ILI) was below the national baseline. One of the ten surveillance regions reported ILI above their region-specific baseline. Five states reported geographically widespread influenza activity, 13 states reported regional activity, the District of Columbia and 15 states reported local influenza activity; 16 states reported sporadic influenza activity, and one state reported no influenza activity.

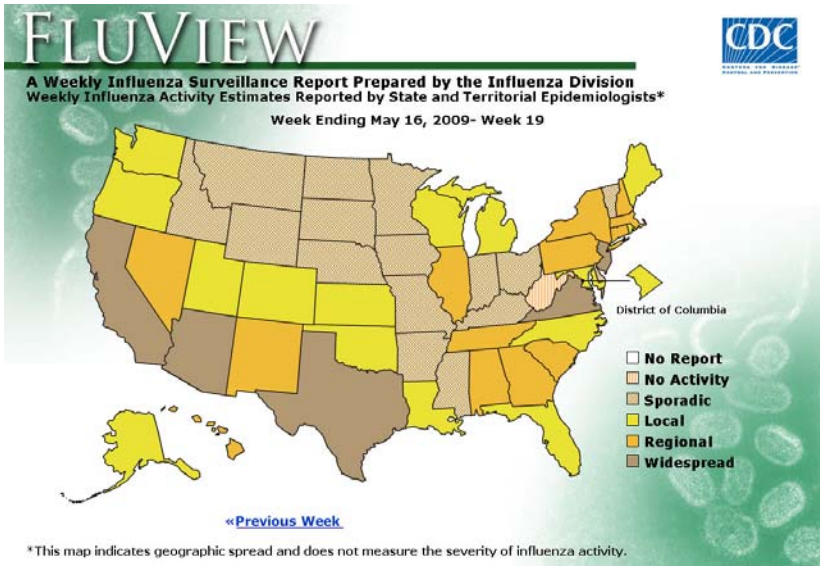
During week 19, seasonal influenza A (H1), A (H3), and B viruses continue to co-circulate with novel influenza A (H1N1). Approximately 73% of all influenza viruses being reported to CDC are novel influenza A (H1N1) viruses. The increase in the percentage of specimens testing positive for influenza by WHO and NREVSS collaborating laboratories may be due in part to changes in testing practices by healthcare providers, triaging of specimens by public health laboratories, an increase in the number of specimens collected from outbreaks, and other factors.



Since October 1, 2008, 893 seasonal influenza A (H1N1), 145 influenza A (H3N2), and 444 influenza B viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Eight hundred seventy-six seasonal influenza A (H1N1) and 145 influenza A (H3N2) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). One hundred twenty-eight novel influenza A (H1N1) viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Ninety-six novel influenza A (H1N1) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). The results of antiviral resistance testing performed on these viruses are summarized in the table below.

	Isolates tested (n)	Resistant Viruses, Number (%)		Isolates tested (n)	Resistant Viruses, Number (%)
		Oseltamivir	Zanamivir		Adamantanes
Seasonal Influenza A (H1N1)	893	888 (99.4%)	0 (0)	876	4 (0.5%)
Influenza A (H3N2)	145	0 (0)	0 (0)	145	145 (100%)
Influenza B	444	0 (0)	0 (0)	N/A*	N/A*
Novel Influenza A (H1N1)	128	0 (0)	0 (0)	96	96 (100%)

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



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

International (WHO, May 15): *This summary provides an updated report of seasonal influenza activity for weeks 17-18 of 2009. It does not include reports of avian influenza in humans, which are available at: the WHO avian influenza page. or reports of the recent influenza A (H1N1) virus which has recently emerged, which are available at: the WHO page for influenza A(H1N1).*

During the weeks 17-18, influenza seasonal activity continued to decrease in the northern hemisphere. Local activity due to seasonal influenza was reported by Canada (H1,H3,B), the Russian Federation (H1,H3,B) and United States of America (H1,H3,B). More countries in the southern hemisphere reported sporadic activity due to H1, H3 or B than in previous weeks. Mexico reported regional activity due to the new influenza A (H1N1) virus and low level B activity.

Sporadic influenza activity was observed in Australia (H1,H3,B), China (H1,H3,B), Denmark (H3,B), Estonia (B), Israel (H1,B), Italy (H1), Kazakhstan (A,B), Kenya (H1,H3), Latvia (H1,H3,B), Madagascar (H3,B), New Zealand (H1,H3), Oman (H3,B), Romania (A), Slovenia (H3,B), Spain (B), South Africa (H3,B), Switzerland (B) and Turkey (B).

Argentina, Belgium, Cameroon, Greece, Iran, Poland and Senegal reported no activity.

MDCH reported **LOCAL INFLUENZA ACTIVITY** to the CDC for the week ending May 23, 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. *FluBytes* is published weekly during the influenza season.

Avian and Novel Influenza Activity

WHO Pandemic Phase: Phase 5 - characterized by human-to-human spread of the virus into at least two countries in one WHO region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short.

International, Human (WHO, May 28): The Ministry of Health of Egypt has reported two new confirmed human cases of avian influenza on 26 May 2009. The two cases are from two separate districts of Sharkia Governorate. The first case is a 4-year old male from Hehia City, Hehia District. His symptoms began with fever on 24 May 2009. The second case is a 4-year old female from Abo Hammad District. Her symptoms began with fever on 23 May 2009. Both cases were admitted to Zagazig Fever Hospital where they received oseltamivir and are in a stable condition.

Investigations into the source of infection indicated that the above two cases had close contact with dead and sick poultry. Both cases were confirmed by the Egyptian Central Public Health Laboratories on 26 May 2009.

Of the 76 cases confirmed to date in Egypt, 27 have been fatal.

International, Human (Reuters Alertnet, May 21): The H5N1 bird flu virus can infect people without causing noticeable symptoms, but only rarely, according to a report published on Thursday [21 May 2009].

A survey of more than 600 people in Cambodian villages where 2 children died from the virus shows 7 more were apparently infected, but without having known about it. The study, published in the Journal of Infectious Diseases, also suggests that people may become infected by swimming in ponds where infected birds have dabbled. "Although these results cannot be considered to be representative without broader confirmation, they show that, in some settings, surveillance may substantially miss H5N1 virus infections," Dr Sylvie Briand and Dr Keiji Fukuda of the World Health Organization (WHO) wrote in a commentary.

The H5N1 avian influenza virus has been regularly causing outbreaks of disease in birds -- 250 outbreaks in February [2009] alone in Bangladesh, China, Egypt, India, Indonesia, Laos, Nepal, and Viet Nam, according to the UN Food and Agriculture Organization (FAO). It only rarely infects people but is often deadly when it does. WHO says it has killed 261 people out of 424 infected since 2003. The big fear is that is could change into a form that people can pass easily to one another, sparking a pandemic. These fears have been overshadowed at least a little by the near pandemic of much milder H1N1 swine flu that started in March [2009].

One big question has been whether some people have been infected without knowing it. If this is the case, the fatality rate would go down. With current numbers, the fatality rate appears to be around 60 percent but if there are more than 424 infections it would make for a lower rate.

Sirenda Vong of the Institut Pasteur in Cambodia and colleagues followed up on 2 deaths of children from H5N1 in 2006. They interviewed villagers and took blood samples. "7 (1 percent) of 674 villagers tested seropositive for influenza H5N1 antibodies and did not report severe illness," they wrote. This means their bodies had at some point fought off an H5N1 infection. Most were male, 18 or younger, and were more likely than other villagers to have reported bathing or swimming in household ponds. They all lived in wooden houses on stilts with well or pond water as the only water source for the family and none had known contact with the 2 children who died.

Scientists know that birds can pass influenza viruses in their droppings and ducks, especially, can foul ponds with virus-infected droppings. The virus can live in droppings or water for up to 6 days. "During the study period, most participants reported repeated direct and close poultry contact, including feeding or

touching poultry (73.3 percent), collecting poultry feces for manure (50.9 percent), plucking feathers of sick poultry (31.1 percent), or collecting sick and/or dead poultry with bare hands (36.8 percent)," the researchers wrote. But, they added that the findings suggest that transmission from sick bird to human in Cambodia was rare in 2006.

They found genetic material from the H5N1 virus in specimens taken from ponds and pond plants. "Our results also indicate that swimming or bathing in household ponds could be a risk factor for influenza H5N1 virus infection. These small ponds are common and usually serve as a water source for backyard animals and gardening," they wrote. "Ducks usually have access to these ponds and may deposit large amounts of feces in ponds in which children commonly bathe and play."

International, Wild Birds (People's Daily, Xinhua News Report [edited], May 25): Mongolia's Emergency Situations Agency announced today [25 May 2009] that, on 22 May, swans had died of unknown cause in Ogii Nuur Lake, in the Arkhangai Aimag. After analysis, the Mongolian National Livestock Infectious Disease Prevention and Control Center announced on [24 May 2009] that the swans died due to infection by H5N1 avian influenza. On 24 May [2009], the governor of Arkhangai Aimag ordered closure of the outbreak area.

Michigan Wild Bird Surveillance (USDA, as of May 28): For the 2009 testing season, no Michigan samples have been taken so far. HPAI subtype H5N1 has not been recovered from any Michigan samples tested to date, or from the 250 birds or environmental samples tested nationwide for the 2009 testing season, which will run from April 1, 2009 - March 31, 2010. For more information, visit the National HPAI Early Detection Data System website at http://wildlifedisease.nbii.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 Vagasky at 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 May 25, 2009)

(Source: http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm Downloaded 5/27/09)

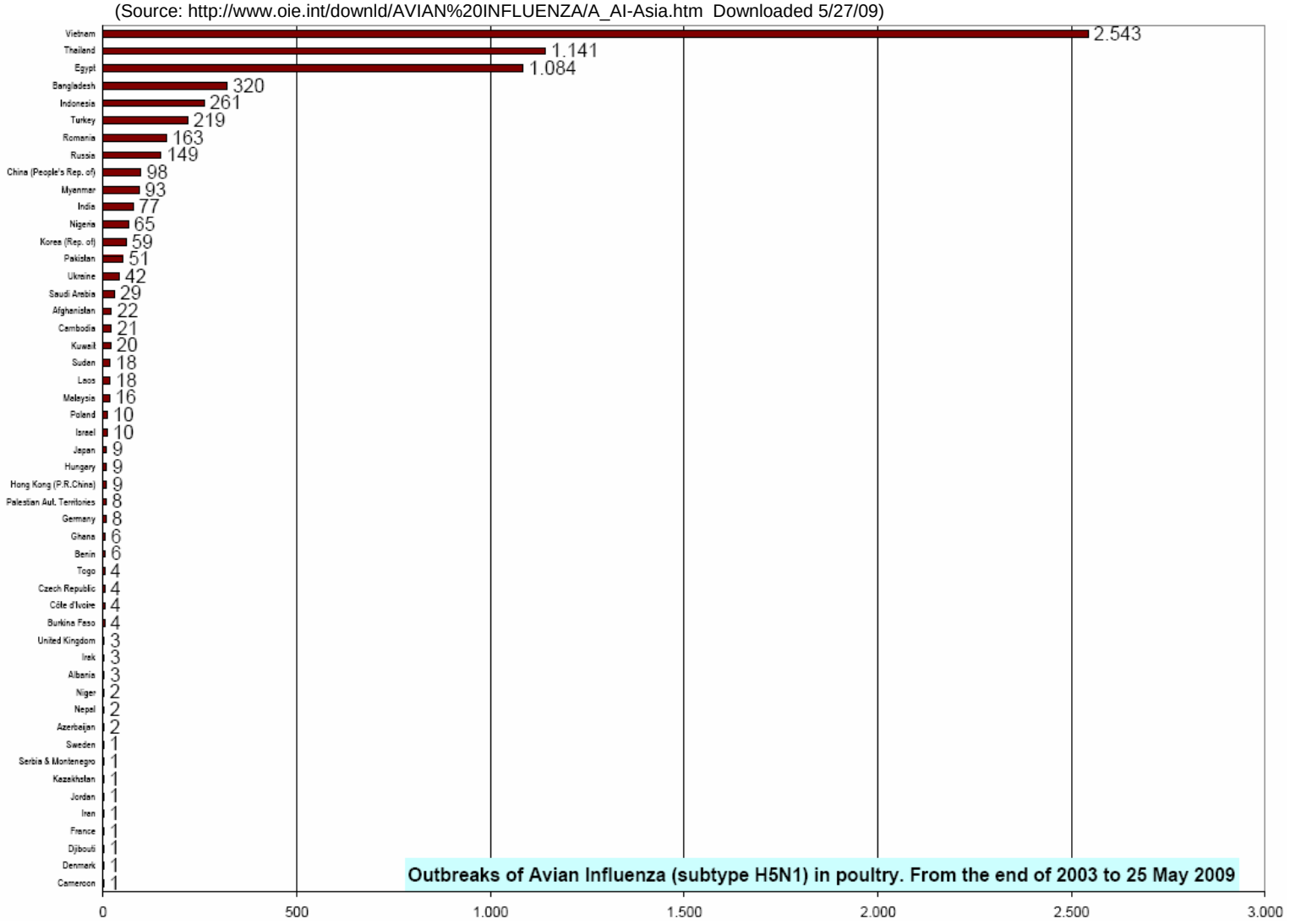

Table 2. H5N1 Influenza in Humans (Cases up to May 28, 2009)

(http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_05_28/en/index.html Downloaded 5/28/2009)

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	25	4	76	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	36	12	431	262