



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:** Overall influenza activity is low, but the H1N1 pandemic virus continues to circulate and cause congregating outbreaks.
- **National Surveillance:** Influenza activity continues decreasing but is still above baseline levels.
- **International Surveillance:** WHO issues updated list of countries with H1N1 pandemic cases.

*****Pandemic Influenza A (H1N1) virus (Swine-origin Flu) 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 July 25, 3166 cases of flu-like illness and confirmed and probable cases of seasonal and novel influenza, including 10 deaths (as of July 30), were reported in Michigan.

MDCH is now reporting the aggregate number of confirmed and probable cases by county, using the Michigan Disease Surveillance System (MDSS) as the data source. A confirmed case of pandemic influenza A (H1N1) virus infection is defined as a person with an influenza-like illness (ILI) who tests positive for pandemic influenza A (H1N1) by RT-PCR as performed by the MDCH Bureau of Laboratories. A probable case is defined as a person with an ILI who tests positive with either a commercial pandemic influenza A H1 PCR test that has not been validated by the MDCH Bureau of Laboratories or who tests positive for influenza A, but is negative for seasonal influenza H1 and H3 by RT-PCR.

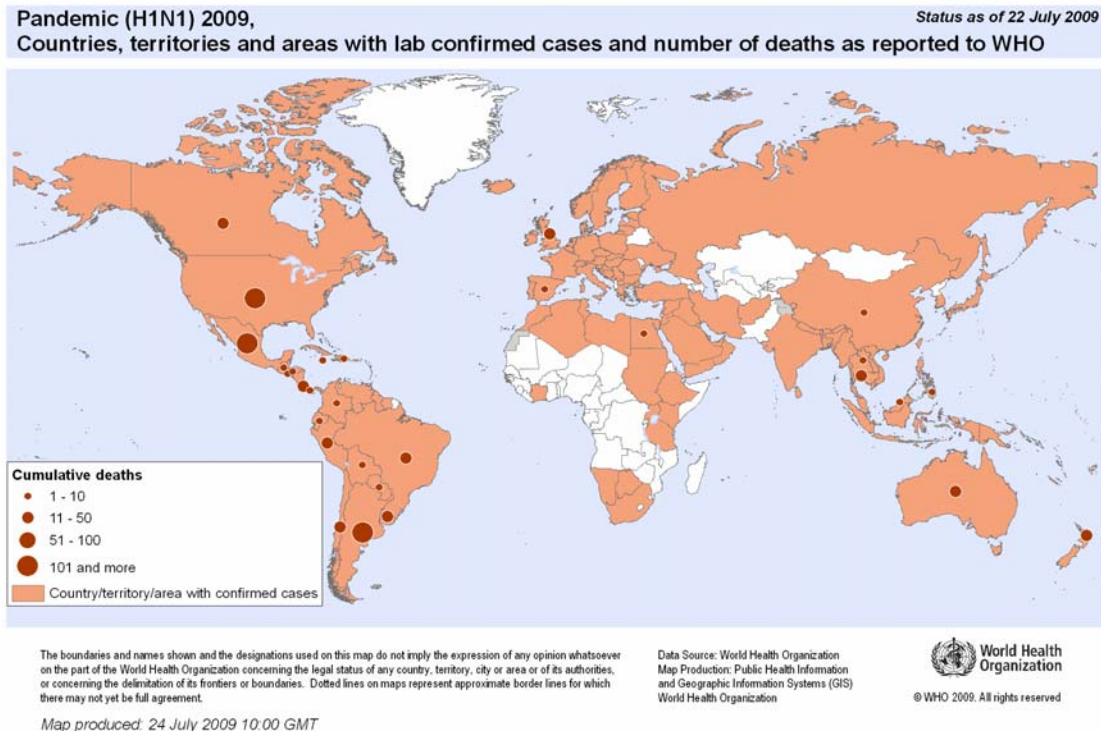
Please continue to reference the State of Michigan's swine-origin influenza A (H1N1) website at www.michigan.gov/h1n1flu for additional information. Local health departments can find additional guidance documents on the MI-HAN homepage.

National (CDC): As of July 24, 2009, 11:00am ET, the Centers for Disease Control and Prevention (CDC) is reporting 43,771 confirmed human infections, including 302 deaths, in the United States. These cases are being reported from 55 states and territories. July 24, 2009 is the last day that CDC is providing individual confirmed and probable cases of novel H1N1 influenza. 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 novel H1N1 flu outbreak. For more information about CDC's novel H1N1 influenza surveillance system, see [Questions & Answers About CDC's Novel H1N1 Influenza Surveillance](#).

For the most up to date information, please visit the CDC's website at www.cdc.gov/h1n1flu/.

International (WHO, July 27): The countries and overseas territories/communities that reported their first pandemic (H1N1) 2009 confirmed case(s) since the last web update (6 July 2009) as of 22 July 2009: Afghanistan, Andorra, Belize, Bhutan, Botswana, La Réunion (French Overseas Community), Haiti, the Marshall Islands, the Federated States of Micronesia, Namibia, Sint Eustatius (Netherlands Antilles), Saint Kitts and Nevis, Saint Vincent and the Grenadines, Seychelles, Solomon Islands, the Sudan, Tonga, Turks and Caicos Islands (UK Overseas Territory), the United Republic of Tanzania, American Samoa (US), Guam (US)

Total cases reported worldwide are 134,503 with 816 deaths; 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.



International (WHO Briefing note 4, July 24): The number of human cases of pandemic (H1N1) 2009 is still increasing substantially in many countries, even in countries that have already been affected for some time.

Our understanding of the disease continues to evolve as new countries become affected, as community-level spread extends in already affected countries, and as information is shared globally. Many countries with widespread community transmission have moved to testing only samples of ill persons and have shifted surveillance efforts to monitoring and reporting of trends. This shift has been recommended by WHO, because as the pandemic progresses, monitoring trends in disease activity can be done better by following trends in illness cases rather than trying to test all ill persons, which can severely stress national resources. It remains a top priority to determine which groups of people are at highest risk of serious disease so steps to best to protect them can be taken.

In addition to surveillance information, WHO is relying on the results of special research and clinical studies and other data provided by countries directly through frequent expert teleconferences on clinical, virological and epidemiological aspects of the pandemic, to gain a global overview of the evolving situation.

Average age of cases increasing

In most countries the majority of pandemic (H1N1) 2009 cases are still occurring in younger people, with the median age reported to be 12 to 17 years (based on data from Canada, Chile, Japan, UK and the United States of America). Some reports suggest that persons requiring hospitalization and patients with fatal illness may be slightly older.

As the disease expands broadly into communities, the average age of the cases is appearing to increase slightly. This may reflect the situation in many countries where the earliest cases often occurred as school outbreaks but later cases were occurring in the community. Some of the pandemic disease patterns differ from seasonal influenza, where fatal disease occurs most often in the elderly (>65 years old). However, the full picture of the pandemic's epidemiology is not yet fully clear because in many countries, seasonal influenza viruses and pandemic (H1N1) 2009 viruses are both circulating and the pandemic remains relatively early in its development.

Although the risk factors for serious pandemic disease are not known definitively, risk factors such as existing cardiovascular disease, respiratory disease, diabetes and cancer currently are considered risk factors for serious pandemic (H1N1) 2009 disease. Asthma and other forms of respiratory disease have

been consistently reported as underlying conditions associated with an augmented risk of severe pandemic disease in several countries.

A recent report suggests obesity may be another risk factor for severe disease. Similarly, there is accumulating evidence suggesting pregnant women are at higher risk for more severe disease. A few preliminary reports also suggest increased risk of severe disease may be elevated in some minority populations, but the potential contributions of cultural, economic and social risk factors are not clear.

Vaccine situation

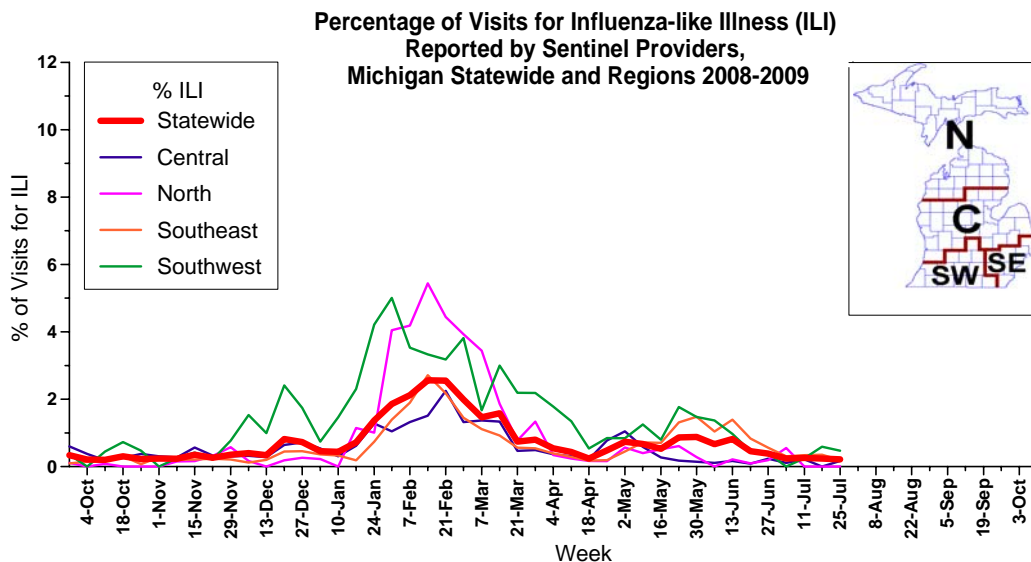
The development of new candidate vaccine viruses by the WHO network is continuing to improve yields (currently 25% to 50 % of the normal yields for seasonal influenza for some manufacturers). WHO will be able to revise its estimate of pandemic vaccine supply once it has the new yield information. Other important information will also be provided by results of ongoing and soon-to-be-initiated vaccine clinical trials. These trials will give a better idea of the number of doses required for a person to be immunized, as well as of the quantity on active principle (antigen) needed in each vaccine dose. Manufacturers are expected to have vaccines for use around September. A number of companies are working on the pandemic vaccine production and have different timelines.

Michigan Disease Surveillance System: The week ending July 25 saw aggregate flu-like numbers and individual influenza reports hold steady near baseline levels. Novel influenza reports have decreased slightly over the past two weeks. All numbers, except novel influenza reports, which are slightly higher, are near summer baseline levels and are consistent with the numbers seen this time last year.

Emergency Department Surveillance: Emergency department visits from constitutional complaints held steady near the previous week's levels, and respiratory complaints decreased slightly. Both constitutional and respiratory numbers are comparable to numbers seen at this time last year. Five constitutional alerts in the C(2) and SW(3) Influenza Surveillance Regions and one respiratory alert in the C Influenza Surveillance Region were generated last week.

Over-the-Counter Product Surveillance: Overall, OTC product sales were mixed last week. Sales of chest rubs, thermometers and children's electrolytes decreased slightly; remaining indicators held steady near the previous week's levels. All indicator levels are comparable to those seen at this time last year, except cough/cold medication sales, which are slightly lower.

Sentinel Provider Surveillance (as of July 30): During the week ending July 25, 2009, the proportion of visits due to influenza-like illness (ILI) remained the same compared to the previous week at 0.2% overall; 12 patient visits due to ILI were reported out of 5,410 office visits. Twenty-three sentinel sites provided data for this report. The increased level of ILI activity for this time of year may be an indication of pandemic influenza A (H1N1) circulation. Activity increased in one surveillance region: Central (0.2%); remained the same in the North (0.0%) region and decreased in the remaining two regions: Southeast (0.2%) and Southwest (0.5%). 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 for more information.

Laboratory Surveillance (as of July 30): 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 317 seasonal influenza isolates (followed by Influenza Surveillance Regions of origin):

- 188 A/H1N1 or A/H1 (63SE, 43SW, 25C, 57N)
- 10 A/H3N2 or A/H3 (5SE, 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)

7 sentinel laboratories reported for the week ending July 25, 2009. 2 labs (SW, C) reported sporadic to increasing influenza A positives and 5 labs reported zero influenza A positives (SE, SW, C, N). 9 labs reported zero influenza B positives (SE, SW, C, N).

Michigan Influenza Antigenic Characterization (as of July 30): 36 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.

8 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 July 30): 36 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 36 viruses were resistant to oseltamivir (Tamiflu®) and sensitive to zanamivir, amantadine and rimantadine. These viruses were collected in the SE(15), SW(13), C(2) and N(6) 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.

6 Michigan pandemic influenza A (H1N1) specimens have been evaluated by CDC for resistance to the adamantane class of antiviral medications; all specimens were resistant. 5 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 July 30): 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.

Influenza Congregate Settings Outbreaks (as of July 30): Three congregated 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 congregated setting outbreaks in Michigan associated with pandemic influenza A H1N1 have been reported to MDCH (1SE, 3SW, 1C, 1N).

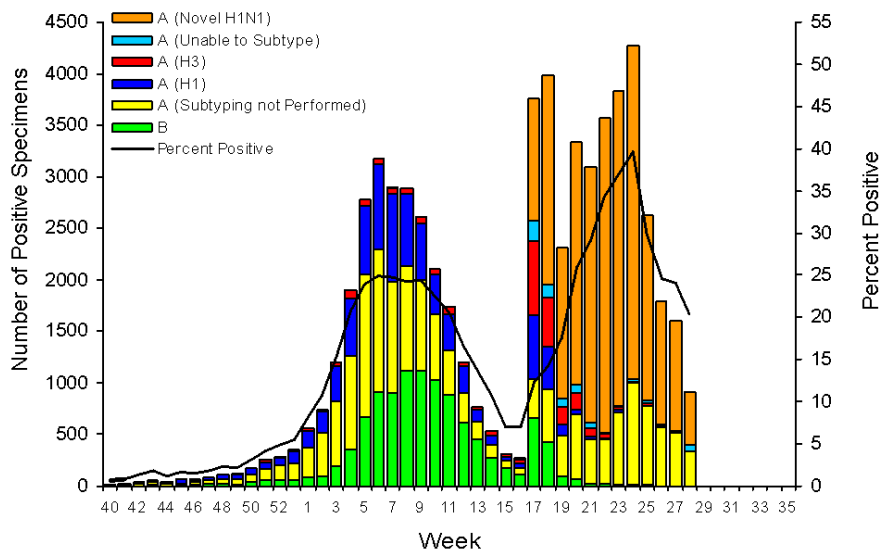
National (CDC [edited], July 24): During week 28 (July 12-18, 2009), influenza activity decreased in the United States; however, there were still higher levels of influenza-like illness than is normal for this time of year. Nine hundred fourteen (20.5%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. Over 99% of all subtyped influenza A viruses being reported to CDC were novel influenza A (H1N1) viruses. The proportion of deaths attributed to pneumonia and influenza (P&I) was above the epidemic threshold. Five influenza-associated pediatric deaths were reported and four of the five deaths were associated with novel influenza A (H1N1) virus infection. The proportion of outpatient visits for influenza-like illness (ILI) was below national and region-specific baseline levels. Seven states reported geographically widespread influenza activity, 13 states and Puerto Rico reported regional influenza activity, 13 states and the District of Columbia reported local influenza activity, and 17 states reported sporadic influenza activity.

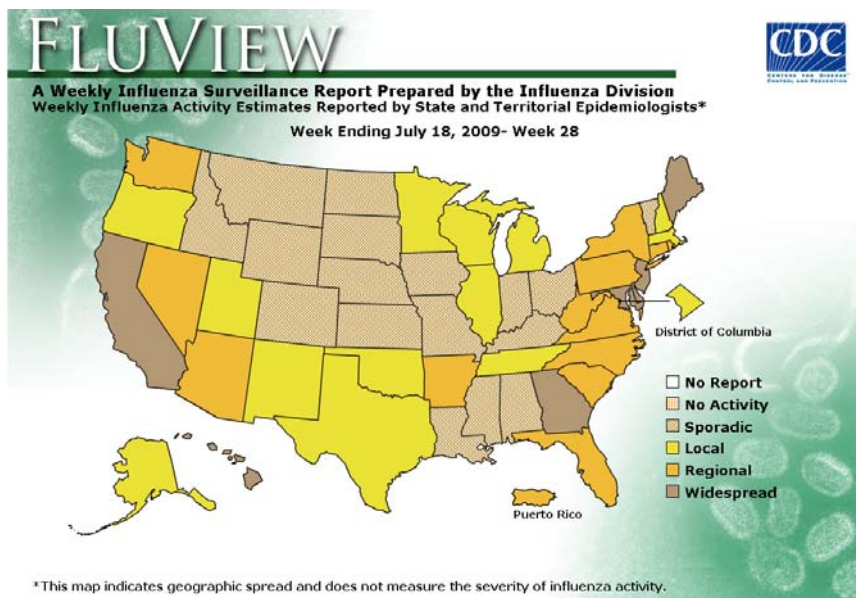
Since October 1, 2008, 1,099 seasonal influenza A (H1N1), 213 influenza A (H3N2), and 620 influenza B viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Also, 1,100 seasonal influenza A (H1N1) and 216 influenza A (H3N2) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). Two hundred seventy-four novel influenza A (H1N1) viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Three hundred twelve 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		
Seasonal Influenza A (H1N1)	1,099	1,094 (99.5%)	0 (0)	1,100	6 (0.5%)
Influenza A (H3N2)	213	0 (0)	0 (0)	216	216 (100%)
Influenza B	620	0 (0)	0 (0)	N/A*	N/A*
Novel Influenza A (H1N1)	274	0 (0)	0 (0)	312	312 (100%)

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

Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2008-09





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

International (WHO, July 24): 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 27-28, Chile reported predominantly H3 activity with low numbers of influenza B while influenza A was detected in Brazil. Influenza activity in South Africa was still regional and the predominant virus was H3. In Australia local activity occurred with H3 and H1 cocirculating while New Zealand reported predominantly H1. Local outbreaks of influenza B have been reported by Madagascar and Réunion.

Sporadic seasonal influenza activity was observed in Algeria (A), Cameroon (H3), Canada (H3), China (H1,H3,B), Côte d'Ivoire (H1,H3), Greece (H3), Iran (H1,H3,B), Italy (H3), Japan (H1,H3), Republic of Korea (H1,H3), Romania (H3), Russian Federation (H1,H3,B), Tunisia (B), Senegal (H3), Sri Lanka (A) and United States of America (H1,H3,B). Albania, Belarus, Belgium, Bulgaria, Denmark, Estonia, Kazakhstan, Latvia, Lithuania, Morocco, Netherlands, Poland, Serbia, Slovakia, Slovenia, Turkey and Ukraine reported no activity.

MDCH reported **LOCAL INFLUENZA ACTIVITY** to the CDC for the week ending July 25, 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 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, Antiviral Resistance (Associated Press, July 28): Japan has found a third case of Tamiflu-resistant swine flu in a man who had taken the drug to prevent infection, the Tokushima prefectural office said Tuesday.

Just six cases of Tamiflu-resistant swine flu have been reported worldwide.

In a statement, the prefectural health department said the man in his 30s was given Tamiflu after his colleague was infected with the virus this month.

The Tamiflu-resistant strain does not appear to have spread beyond the man, who has recovered, the prefectural health department said.

Preventive use of Tamiflu has occasionally given rise to resistant viruses, including those of seasonal flu. Denmark, Hong Kong and Canada also have reported one case each of Tamiflu-resistant swine flu.

International, Swine (Alberta Farmer Express [edited], July 28): An isolated case of the pandemic strain of (H1N1) influenza has been confirmed in a Quebec hog herd that has since "completely recovered."

The provincial agriculture, food and fisheries ministry (MAPAQ) said in a release Tuesday that the strain had been identified Friday [24 Jul 2009] at the labs of the National Centre for Foreign Animal Disease in Winnipeg. MAPAQ emphasized Tuesday that no other case has been reported on any other hog farm in Quebec and no people have caught the virus from the herd, saying "there is no human case related to this situation." A MAPAQ spokesman said Tuesday that it's not known how the hogs caught the virus.

MAPAQ pathologist Dr Alain Laperle told the Quebec farmers' newspaper La Terre de Chez Nous on Tuesday that no one in the hog farmer's family, nor any of the hog farm's workers or visitors, has been sickened by the virus. Laperle told the newspaper that the 1st clinical signs of the flu were detected in the herd at the end of June. Neither the newspaper nor the ag [MAPAQ] ministry gave the name or location of the hog farm in question. La Terre also quoted Laperle as saying that while the vector by which the disease came to the farm may never be known, the "most probable hypothesis" is that it came through a human carrier.

The ministry in its release Tuesday [28 Jul 2009] also emphasized that Quebec's pork supply is safe to consume and poses no human health risk.

Tuesday's announcement follows a statement Friday from the Canadian Food Inspection Agency (CFIA) that it will not quarantine hog herds found to carry (H1N1). The agency hasn't yet made any official statement on the Quebec case.

CFIA said Friday that affected animals from now on "will be managed using the same veterinary management and biosecurity practices employed for other swine influenza viruses." That means "limiting opportunities for (H1N1) to spread to susceptible animals," the agency said, noting pork slaughter plants have "multiple inspection points to ensure that only healthy animals enter the food supply." All herds in which (H1N1) is detected will be monitored to verify that infected animals recover. As well, CFIA added, surveillance for the presence of (H1N1) in swine will continue, so as "to detect any changes in how the virus affects swine and to identify any changes in the structure of the virus."

CFIA's decision follows the quarantine it slapped on a hog herd near Rocky Mountain House, [Alberta], earlier this spring. The herd was believed to have caught the virus from a person, although the visitor previously suspected of bringing the virus to the farm from Mexico has since been ruled out as the carrier. None of the animals that came down with (H1N1) died from it, but the federal quarantine dragged on as positive tests continued to turn up within the herd. Faced with an indefinite quarantine and overcrowded facilities, the hogs' owner, Arnold Van Ginkel, eventually culled all of his 2000-plus animals last month for animal welfare reasons.

The only other known case of the pandemic strain of (H1N1) crossing over from humans to hogs was reported in Argentina earlier this month.

Michigan Wild Bird Surveillance (USDA, as of July 30): 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, which includes 26 live wild bird and 9 morbidity/mortality specimens. HPAI subtype H5N1 has not been recovered from the 4,739 birds or environmental samples tested nationwide for the 2009 season. For more information, visit the National HPAI Early Detection Data System website 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 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 June 26, 2009)

(Source: http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm Downloaded 7/2/09)

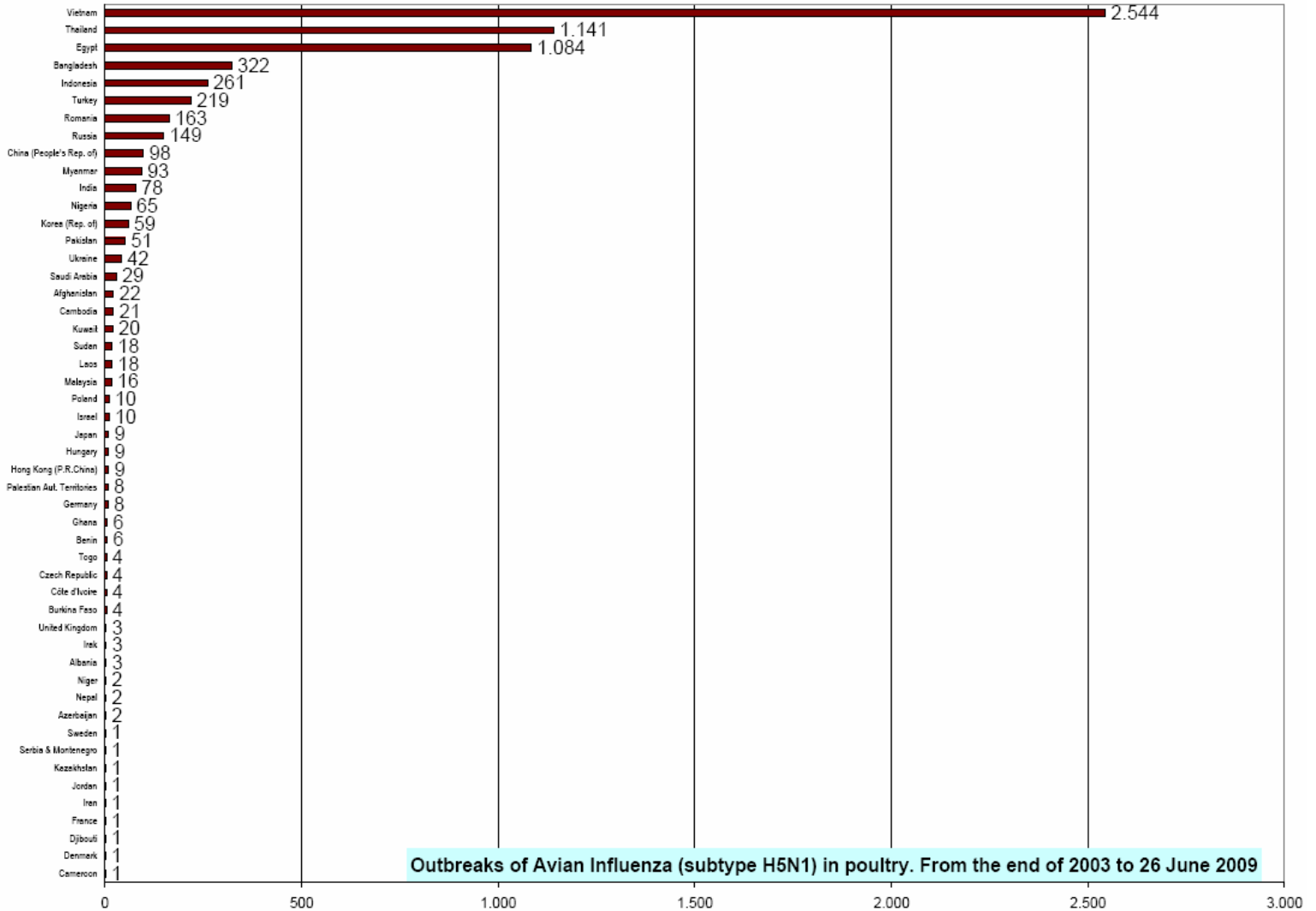


Table 2. H5N1 Influenza in Humans (Cases up to July 1, 2009)

(http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_07_01/en/index.html Downloaded 7/7/2009)

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	30	4	81	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	41	12	436	262