



MI FluFocus

Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology
Bureau of Laboratories



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August 20, 2009
Vol. 6; No. 32

New updates in this issue:

- **Michigan Surveillance:** New guidance available for influenza testing at MDCH Bureau of Laboratories.
- **National Surveillance:** MMWR released on 2 patients with oseltamivir-resistant novel H1N1 influenza.
- **International Surveillance:** Pandemic update 62 now available from WHO.

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 August 15, 3297 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.

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

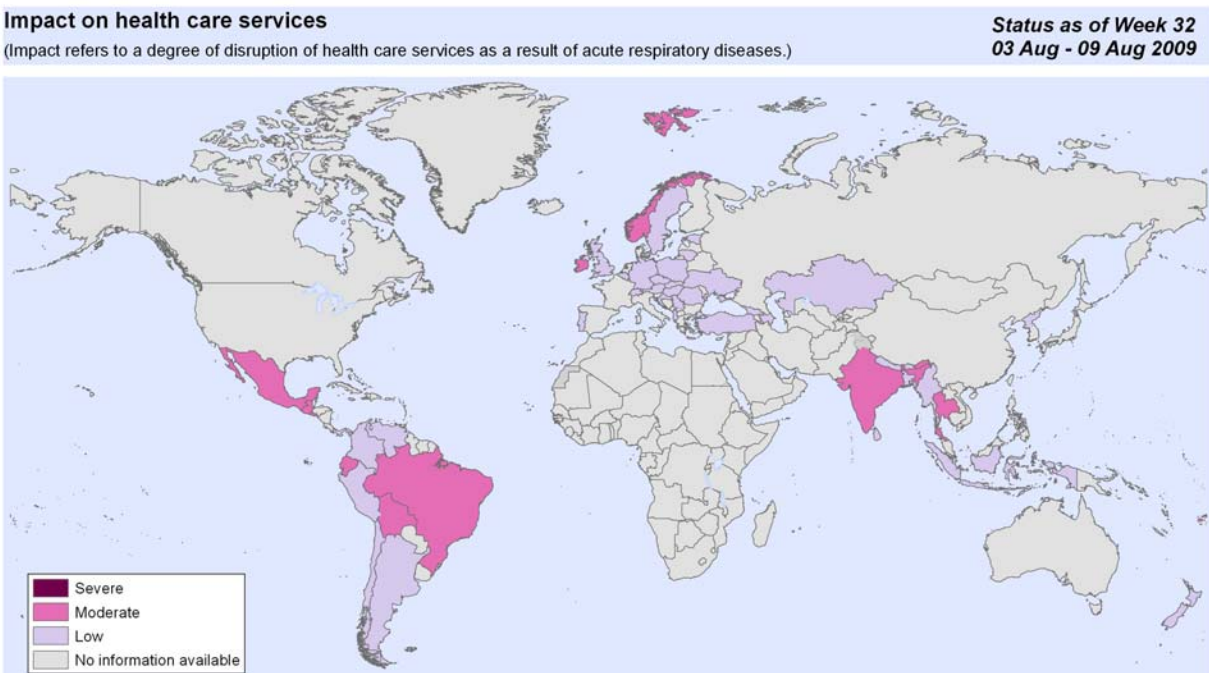
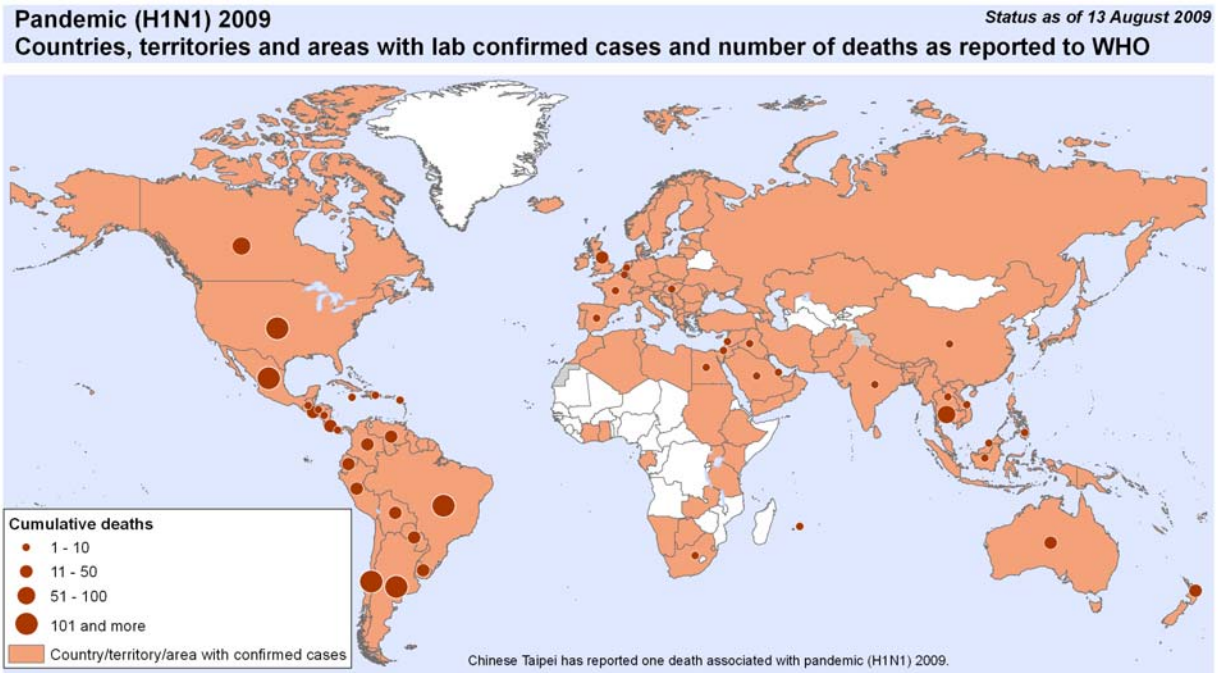
National (CDC): As of August 13, 2009, 11:00am ET, the Centers for Disease Control and Prevention (CDC) is reporting 7511 hospitalizations and 477 deaths due to novel H1N1 influenza in the United States. CDC will report the total number of hospitalizations and deaths each week, and continue to use its traditional surveillance systems to track the progress of the novel H1N1 flu outbreak. For the most up to date information, please visit the CDC's website at www.cdc.gov/h1n1flu/.

International (WHO update 62, August 19): Laboratory-confirmed cases of pandemic (H1N1) 2009 as officially reported to WHO by States Parties to the IHR (2005) as of 13 August 2009: The countries and overseas territories/communities that have newly reported their first pandemic (H1N1) 2009 confirmed case(s) since the last web update (No. 61) as of 13 August 2009 are: Ghana, Zambia, and Tuvalu

Region	Cumulative total	
	as of 13 Aug 2009	
	Cases*	Deaths
WHO Regional Office for Africa (AFRO)	1469	3
WHO Regional Office for the Americas (AMRO)	105882	1579
WHO Regional Office for the Eastern Mediterranean (EMRO)	2532	8
WHO Regional Office for Europe (EURO)	Over 32000	53
WHO Regional Office for South-East Asia (SEARO)	13172	106
WHO Regional Office for the Western Pacific (WPRO)	27111	50
Total	Over 182166	1799

*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.

The entire report is available online at http://www.who.int/csr/don/2009_08_19/en/index.html.

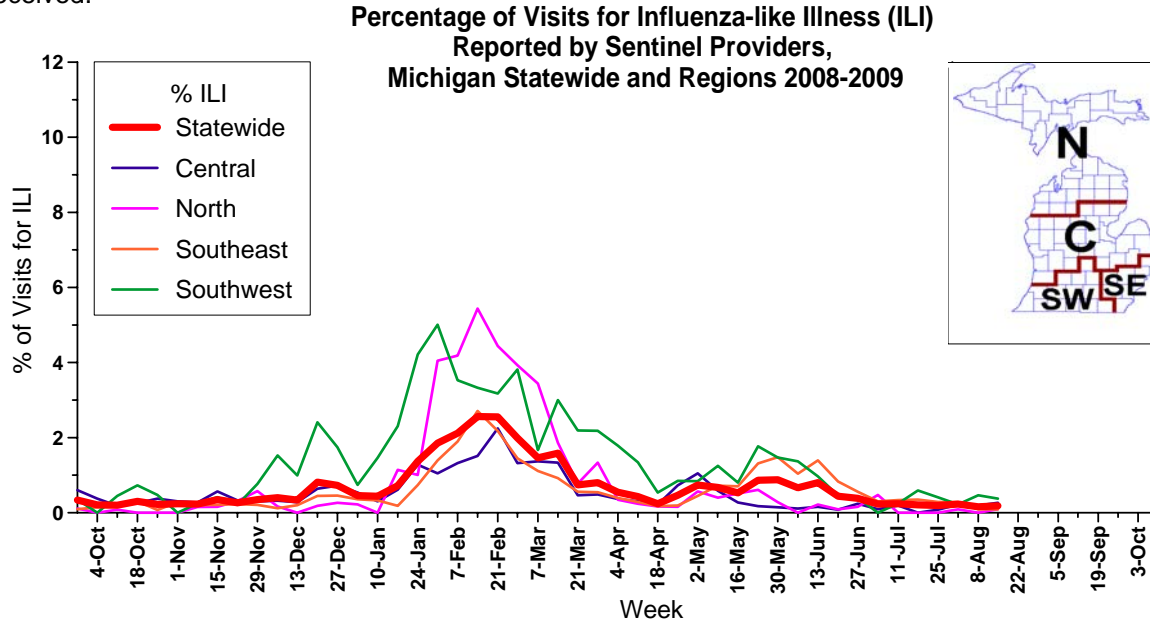


Michigan Disease Surveillance System: The week ending August 15 saw aggregate flu-like numbers hold steady near baseline levels, while individual influenza reports increased slightly. Novel influenza reports rose very slightly over the previous week's numbers. Aggregate numbers are consistent with the numbers seen this time last year, while individual and novel influenza reports are slightly higher.

Emergency Department Surveillance: Emergency department visits from both constitutional and respiratory complaints held steady near the previous week's levels. Both constitutional and respiratory numbers are comparable to numbers seen at this time last year. Seven constitutional alerts in the C(4), N(2), and SW(1) Influenza Surveillance Regions and six respiratory alerts in the C(4) and N(2) Influenza Surveillance Regions were generated last week.

Over-the-Counter Product Surveillance: Overall, OTC product sales were up slightly last week. All indicators saw a slight increase in sales over the previous week's numbers with chest rubs decreasing slightly at the end of the week. All indicator levels are comparable to those seen at this time last year.

Sentinel Provider Surveillance (as of August 20): During the week ending August 15, 2009, the proportion of visits due to influenza-like illness (ILI) remained the same compared to the previous week at 0.2% overall; 15 patient visits due to ILI were reported out of 8,215 office visits. Twenty-seven sentinel sites provided data for this report. Activity increased in two surveillance regions: Central (0.3%) and North (0.1%); remained the same in one surveillance region: Southeast (0.1%); and decreased in the remaining surveillance region: Southwest (0.4%). 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 August 20): 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)

6 sentinel laboratories reported for the week ending August 15, 2009. 1 lab reported sporadic influenza A positives (SE), and 5 labs reported zero influenza A positives (SE, C, N). All 6 labs reported zero influenza B positives (SE, C, N).

Michigan Influenza Antigenic Characterization (as of August 20): 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 August 20): 37 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 37 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(7) 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. 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 August 20): 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 August 20): 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.

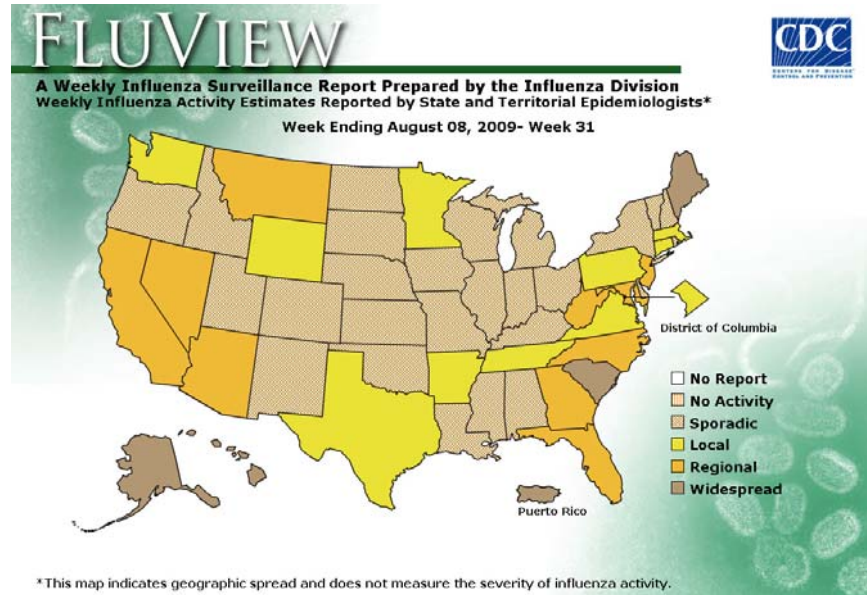
6 congregate setting outbreaks in Michigan associated with pandemic influenza A H1N1 have been reported to MDCH (1SE, 3SW, 1C, 1N).

National (CDC [edited], August 14): During week 31 (August 2-8, 2009), influenza activity decreased slightly in the United States; however, there were still higher levels of influenza-like illness than is normal for this time of year. A total of 7,511 hospitalizations and 477 deaths associated with novel influenza A (H1N1) viruses have been reported to CDC. During week 31: 809 (19.1%) 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. 98% 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 below the epidemic threshold. Three influenza-associated pediatric deaths were reported and all were associated with a novel influenza A (H1N1) virus infection. The proportion of outpatient visits for influenza-like illness (ILI) was below national and region-specific baseline levels. Four states and Puerto Rico reported geographically widespread influenza activity, 10 states reported regional influenza activity, 10 states and the District of Columbia reported local influenza activity, and 26 states reported sporadic influenza activity.

Antiviral Resistance Testing Results:

	Isolates tested (n)	Resistant Viruses, Number (%)		Isolates tested (n)	Resistant Viruses, Number (%)
		Oseltamivir	Zanamivir		
Seasonal Influenza A (H1N1)	1,142	1,137 (99.6%)	0 (0)	1,148	6 (0.5%)
Influenza A (H3N2)	241	0 (0)	0 (0)	235	235 (100%)
Influenza B	646	0 (0)	0 (0)	N/A*	N/A*
Novel Influenza A (H1N1)	318	2 (0.6)	0 (0)	371	371 (100%)

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



*This map indicates geographic spread and does not measure the severity of influenza activity.

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.

MDCH reported **SPORADIC INFLUENZA ACTIVITY** to the CDC for the week ending August 15, 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.

National, Human (MMWR Dispatch abstract, August 14): Influenza (H1N1) 2009 virus infection continues to cause illness and death among persons worldwide. Immunosuppressed patients with influenza virus infection can shed virus for prolonged periods, increasing the chances for development of drug resistance (1-3). On 6 Aug 2009, the Centers for Disease Control and Prevention (CDC) detected evidence of resistance to the antiviral medication oseltamivir in 2 severely immunosuppressed patients with novel influenza A (H1N1) virus [that is, Influenza pandemic (H1N1) 2009 virus] infection in Seattle, Washington. The 2 patients were treated in 2 different hospitals, and their cases were not epidemiologically linked. Both were being treated with oseltamivir for novel influenza A (H1N1) virus infection and had prolonged viral shedding. In both patients, the virus was documented as initially susceptible to oseltamivir, and resistance developed subsequently during treatment with the drug. Testing of viral RNA from both patients by pyrosequencing detected a mutation that results in a histidine-to-tyrosine substitution at position 275 (H275Y) in the neuraminidase, known to be associated with oseltamivir resistance (4,5). The results were confirmed by pyrosequencing, sequencing of the neuraminidase gene, and neuraminidase inhibition testing of virus isolates on 11 Aug 2009. One patient's symptoms resolved after treatment with oseltamivir, and the other patient was receiving treatment with zanamivir and ribavirin as of 13 Aug 2009. An investigation of health care personnel (HCP) contacts and other close contacts revealed no evidence of virus transmission. This report summarizes the case histories and resulting investigations and highlights the importance of 1) close monitoring for antiviral drug resistance among immunosuppressed patients receiving treatment for novel influenza A (H1N1) virus infection and 2) the implications for infection control.

The entire dispatch can be found online at

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58d0814a1.htm?s_cid=mm58d0814a1_e.

Michigan Wild Bird Surveillance (USDA, as of August 20): 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 with any questions regarding this newsletter or to be added to the weekly electronic mailing list.

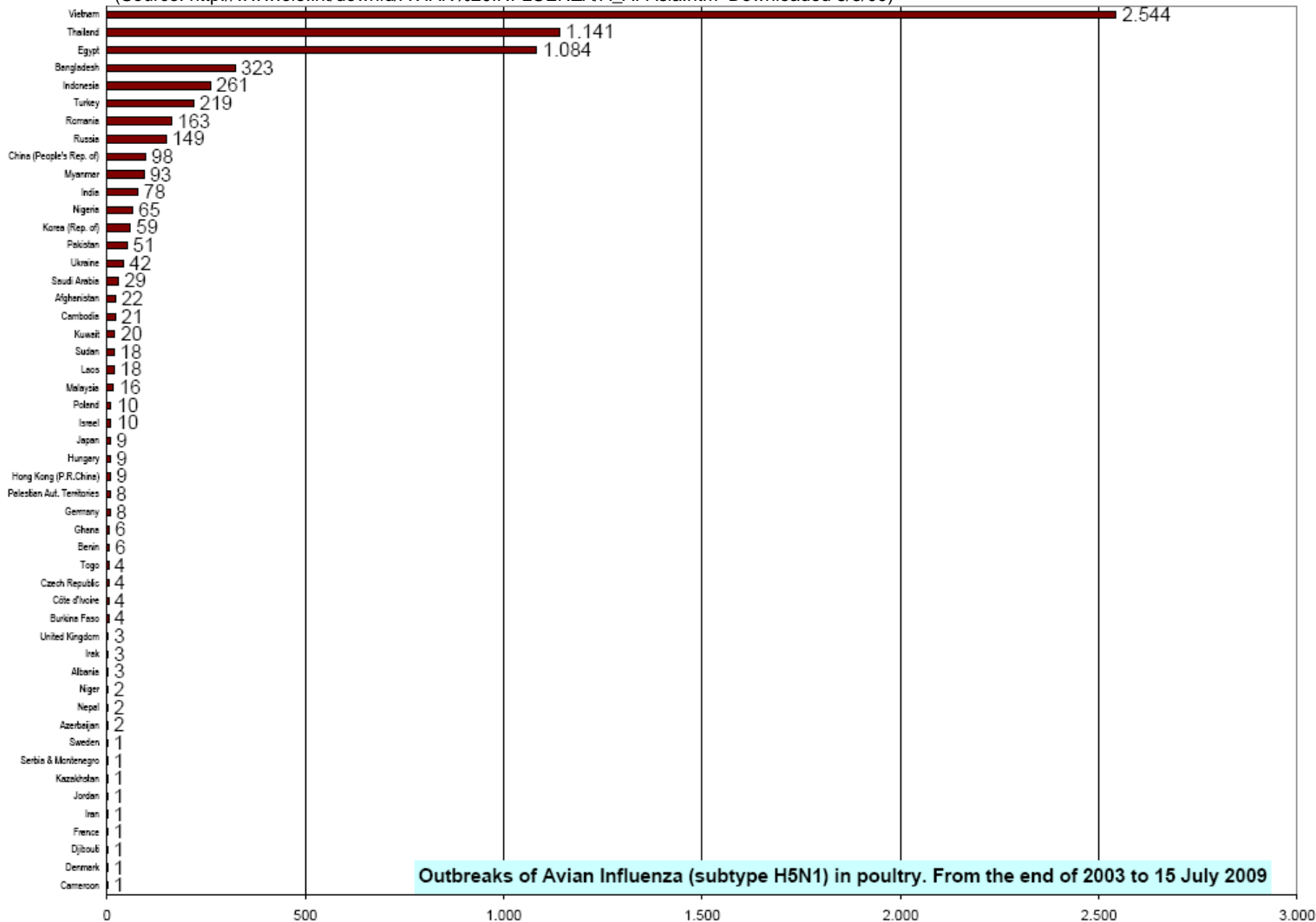
Contributors

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MDCH Bureau of Laboratories – Victoria Vavricka

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

(Source: 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 11, 2009)

(http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_08_11/en/index.html Downloaded 8/11/2009)

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	32	4	83	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	43	12	438	262