



MI FluFocus

Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology
Bureau of Laboratories

Michigan Department
of Community Health



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New updates in this issue:

- **Michigan Surveillance:** Influenza activity continues to decrease; 2 pediatric deaths with flu B reported.
- **National Surveillance:** Overall activity continues to decrease; the majority of isolates are now flu B.
- **Avian Influenza:** Multiple human cases of H5N1 reported; low path H7 detected in Kentucky poultry.

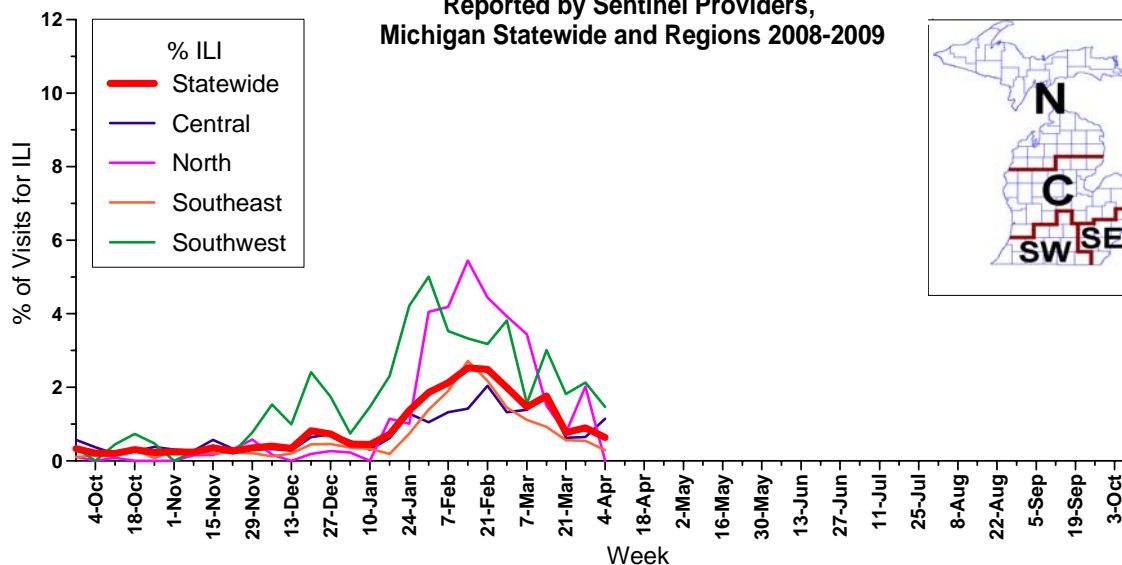
Michigan Disease Surveillance System: The week ending April 4 saw both aggregate flu-like numbers and individual case reports decrease compared to what was seen during the previous week. Aggregate numbers are comparable to numbers seen this time last year, while individual influenza numbers are lower.

Emergency Department Surveillance: During the week ending April 4, emergency department visits from both constitutional and respiratory complaints decreased slightly from the previous week. Visits due to constitutional complaints are comparable to numbers at this time last year, while respiratory complaints are lower. Two constitutional alerts in the SE(1) and N(1) Influenza Surveillance Regions and three respiratory alerts in the SE(1), C(1), and N(1) Influenza Surveillance Regions was generated last week.

Over-the-Counter Product Surveillance: Overall, OTC product sales were steady or down last week. Cough and cold medication sales remained near the previous week's levels, while the remaining indicators all saw a slight decrease in sales. Indicator levels are comparable to those seen at this time last year, except for thermometers, which is slightly lower.

Sentinel Provider Surveillance (as of April 9): During the week ending April 4, 2009, 0.6% of all office visits reported by Michigan influenza sentinel sites were due to influenza-like illness (ILI); this is a slight decrease from the previous week. This represents 39 patient visits due to ILI reported out of 6,163 office visits; 25 sentinel sites provided data for this report. Activity declined in three surveillance regions: North (0.0%), Southeast (0.3%) and Southwest (0.6%). Activity slightly increased in the Central (1.1%) region. Note that these rates may change as additional reports are received.

Percentage of Visits for Influenza-like Illness (ILI)
Reported by Sentinel Providers,
Michigan Statewide and Regions 2008-2009



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 April 9): During the past week, 2 new influenza B isolates were identified at the MDCH Bureau of Laboratories (BOL). For the 2008-2009 influenza season, MDCH BOL has identified 272 influenza isolates (followed by Influenza Surveillance Regions of origin):

- 159 A/H1N1 (55SE, 35SW, 22C, 47N)
- 3 A/H3N2 (1SE, 1C, 1N)
- 110 B (20SE, 40SW, 13C, 34N)
 - 9 B/Florida/4/2006-like (4SE, 1SW, 1C, 3N)
 - 98 B/Malaysia/2506/2004-like (16SE, 40SW, 12C, 30N)
 - 2 are pending characterization (1 SE, 1SW)
 - 1 untypable (SW)

For the week ending April 4, 12 sentinel labs reported. Influenza A activity was either steady or decreasing (SE, SW, C) or at no activity (SE, SW, C, N), with only one lab (SE) noting a very slight increase in positives. Influenza B reporting is mixed, as 2 labs (SE, C) reported increasing influenza B positives, 9 labs (SE, SW, C, N) reported level to decreasing B activity, and 1 lab reported no activity (N). RSV activity was level to decreasing at the majority of labs.

***As a reminder, the positive predictive value of influenza rapid tests decreases during times of low influenza prevalence. MDCH suggests that during periods of low influenza activity in your community, all positive rapid tests results be confirmed by sending in a specimen for viral culture; this can be arranged through your local health department.

Michigan Antigenic Characterization (as of April 9): At this time, 24 influenza A/H1N1 isolates have been antigenically characterized by the CDC; results indicate all 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 Antiviral Resistance Data (as of April 9): 24 influenza 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>.

Influenza-Associated Pediatric Mortality (as of April 9): Two pediatric influenza-associated mortalities were reported to MDCH during the previous week, one in a 5 year old and one in a 6 year old. Both cases were from the SE Influenza Surveillance Region and have positive influenza B test results associated with them. Investigations by both local health department staff and MDCH are ongoing. 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.

Congregate Settings Outbreaks (as of April 9): Three congregated setting outbreaks (1C, 2N) due to influenza (1 influenza A, 1 influenza B, 1 unsubtype) have been reported to MDCH for the 2008-09 influenza season.

National (CDC [edited], April 3): During week 12 (March 22-28, 2009), influenza activity continued to decrease in the United States. Seven hundred twenty-two (16.8%) 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. Eight influenza-associated pediatric deaths were reported. The proportion of outpatient visits for influenza-like illness (ILI) was below the national baseline. Two of nine surveillance regions reported ILI above their region-specific baselines (Mid-Atlantic and Pacific). Thirteen states reported widespread influenza activity, 19 states reported regional activity; 14 states reported local influenza activity; the District of Columbia, Puerto Rico, and three states reported sporadic influenza activity; and one state did not report.

Since week 2 (the week ending January 17, 2009), when influenza activity increased nationally, influenza A (H1) viruses have predominated during the season overall. However, while influenza activity continued to decrease nationally, the relative proportion of influenza B viruses is increasing nationally and regionally. Six surveillance regions (East North Central, Mid-Atlantic, New England, Pacific, South Atlantic, and West North Central) reported a higher proportion of influenza B viruses compared to influenza A viruses this week.

CDC has antigenically characterized 846 influenza viruses [549 influenza A (H1), 86 influenza A (H3) and 211 influenza B viruses] collected by U.S. laboratories since October 1, 2008.

All 549 influenza A (H1) viruses are related to the influenza A (H1N1) component of the 2008-09 influenza vaccine (A/Brisbane/59/2007). All 86 influenza A (H3) viruses are related to the A (H3N2) vaccine component (A/Brisbane/10/2007).

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. Forty-four influenza B viruses tested belong to the B/Yamagata lineage and are related to the vaccine strain (B/Florida/04/2006). The remaining 167 viruses belong to the B/Victoria lineage and are not related to the vaccine strain.

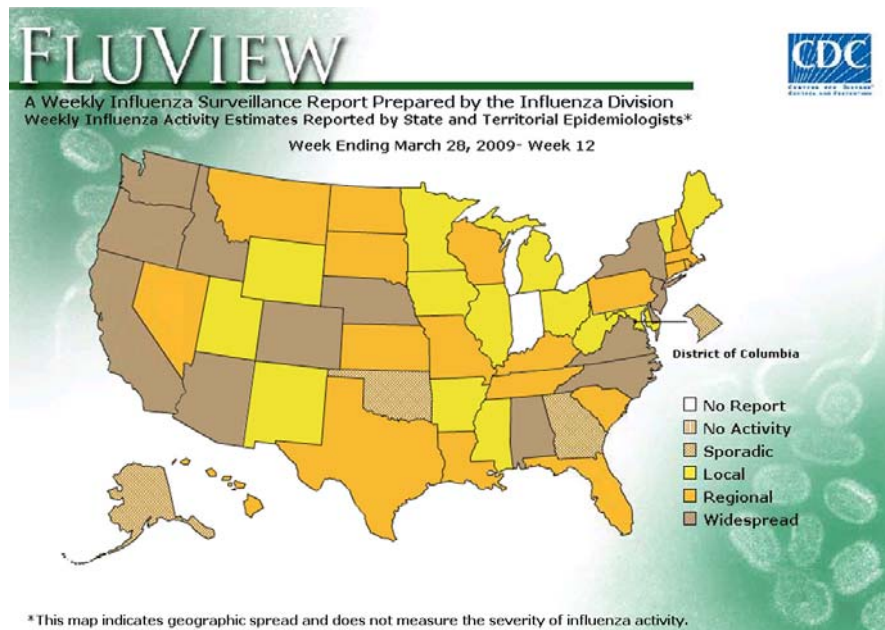
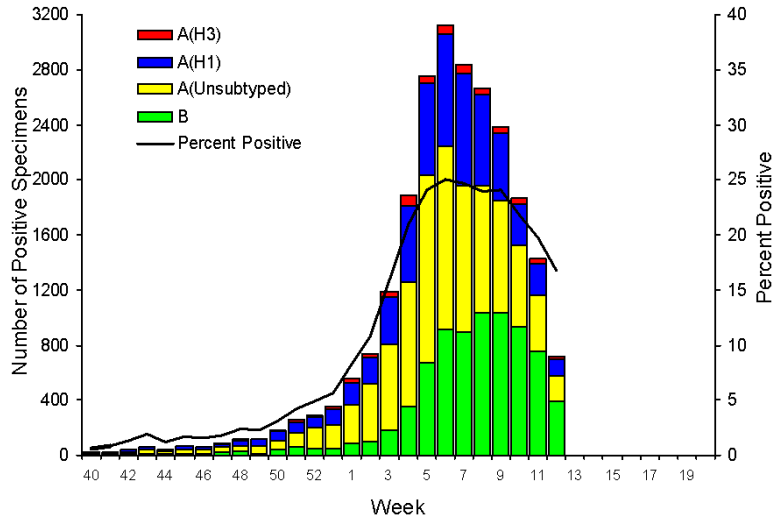
Since October 1, 2008, 654 influenza A (H1N1), 94 influenza A (H3N2), and 274 influenza B viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Six hundred five influenza A (H1N1) and 94 influenza A (H3N2) viruses have been tested for resistance to the adamantanes (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		
Influenza A (H1N1)	654	649 (99.2%)	0 (0)	605	3 (0.5%)
Influenza A (H3N2)	94	0 (0)	0 (0)	94	94 (100%)
Influenza B	274	0 (0)	0 (0)	N/A*	N/A*

*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>

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



International (WHO [edited], April 3): During the weeks 11-12, the level of influenza activity globally decreased in many parts of the world. Influenza activity has declined in most parts of Europe and is below baseline levels in many countries. High influenza activity was reported by the Russian Federation. While influenza A(H3) has continued to be the predominant circulating virus in Europe this season, influenza B virus detections were dominant in over 50% of the countries during weeks 11 -12. In the United States of America, influenza activity continued to decrease nationally while the overall activity in Canada remained similar to previous weeks. Influenza activity declined in China Hong Kong Special Administrative Region.

Sporadic influenza activity was observed in Belgium (B), Bulgaria (A), China (H1,H3,B), Czech Republic (A,B), Denmark (H3,B), France (B), Georgia (B), Germany (H1,H3,B), Israel (A,B), Kazakhstan (A,B), Lithuania (A,B), Luxembourg (B), Mongolia (H1), Norway (H3), Poland (H3,B), Serbia (B), Spain (B), Sweden (A,B), Switzerland (A,B), Tunisia (H1,H3) and United Kingdom of Great Britain and Northern Ireland (H1,H3,B).

Argentina, Cameroon and Malta reported no activity.

To access the entire report, visit <http://www.who.int/csr/disease/influenza/update/en/>

MDCH reported **LOCAL INFLUENZA ACTIVITY** to the CDC for the week ending April 4, 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.

End of Seasonal Report

Avian Influenza Activity

WHO Pandemic Phase: Phase 3 - Human infection(s) with a new subtype, but no human-to-human spread or rare instances of spread to a close contact.

International, Human (WHO, April 8): The Ministry of Health of Egypt has reported 3 new confirmed human cases of avian influenza.

The first case is a 2 year-old boy from Kom Hamada District, El Behira Governorate. He developed symptoms on 27 March and was admitted to Naaora Fever Hospital on the 30 March where he was started on oseltamivir the same day (30 March). He remains in a stable condition.

The second case is also a 2 year-old boy from the same district and was detected through the investigation around the above-mentioned case. He developed symptoms on 31 March and was admitted to Damanhor Fever Hospital on 1 April where he was started on oseltamivir the same day (1 April). He remains in a stable condition.

Both boys had contact with sick/dead poultry prior to the illness onset. Close contacts of both boys have been identified and none has shown symptoms of the infection.

The third case is a 6 year-old boy from Shubra El Khema District, Qaliobia Governorate. He developed symptoms on 22 March and was admitted to Ain Shams University Hospital on the 28 March where he was started on oseltamivir on 3 April. He was exposed to sick/dead poultry prior to the illness onset. He is in a critical condition.

For all of the three cases reported above, infection with H5N1 avian influenza virus was tested positive by the Egyptian Central Public Health Laboratory and subsequently confirmed by the U.S. Naval Medical Research Unit No. 3 (NAMRU-3).

Of the 63 cases confirmed to date in Egypt, 23 have been fatal.

International, Human (WHO, April 8): The Ministry of Health in Viet Nam has reported a new confirmed case of human infection with the H5N1 avian influenza virus. The case has been confirmed at the National Institute of Hygiene and Epidemiology (NIHE).

The case is a 3 year old boy from Chau Thanh District, Dong Thap Province. He developed symptoms on 12 March, was hospitalized on 13 March, and died on 19 March.

Investigations into the source of infection indicated a history of close contact with sick and dead poultry prior to the onset of symptoms.

Of the 110 cases confirmed to date in Viet Nam, 55 have been fatal.

National, Poultry (Kentucky Department of Agriculture, April 3): State and federal authorities are investigating a finding of suspected non-pathogenic or low-pathogenic avian influenza in a single broiler/breeder poultry farm in western Kentucky. The strain poses minimal risk to human health and is not the high-pathogenic strain associated with human and poultry deaths in other countries.

State Veterinarian Robert C. Stout has quarantined the farm, which produces hatching eggs for Perdue Farms Inc. Perdue plans to depopulate 20,000 chickens in two houses on the farm.

"The state and federal government and Perdue are acting aggressively to contain and eliminate the disease," Dr. Stout said. "There is no evidence that any infected poultry are in the human food supply as a result of this infection. We will do what is necessary to minimize the disruption to overseas trade."

"I have been in constant contact with state, federal and industry officials since this came to light," Agriculture Commissioner Richie Farmer said. "The people of Kentucky and our trading partners should rest assured that we are doing everything possible to address the situation."

The Kentucky Department of Agriculture is conducting surveillance on backyard flocks within a two-mile radius of the farm.

A minimal drop in egg production at the farm was noticed in mid-March. Perdue's veterinary services laboratory took samples from chickens at the farm and found antibodies for avian influenza. Testing by the National Veterinary Services Laboratory in Ames, Iowa, resulted in a presumptive positive finding for the H7 strain. Subsequent testing by NVSL and the Breathitt Veterinary Center in Hopkinsville confirmed the finding. [Ed. note: The official OIE report states the virus is low pathogenic H7N9]

No virus has been isolated and no poultry deaths have been found in connection with the infection.

International, Poultry (RP online via ProMed [edited], April 3): 17000 turkeys will be culled on a fattening unit in the district of Kleve after a preliminary test revealed the presence of an LPAI H7 virus. The H7 subtype of avian influenza is probably a virus with low morbidity and mortality rate for poultry, as the district of Kleve on Friday [3 Apr 2009] announced. Further samples are investigated by the NRL (Friedrich-Loeffler-Institut) on the island of Riems and results are expected early next week [beginning 6 Apr 2009]. The application of further precautionary measures, such as implementation of restriction zones, and their scope depend upon the laboratory results.

International, Primates (New Scientist [edited], April 2): A deadly outbreak of what appears to be flu is threatening a group of bonobos in a sanctuary in the Democratic Republic of the Congo (DRC).

Known also as pygmy chimpanzees, bonobos live exclusively in the DRC and are listed as endangered on the IUCN red list. Researchers put their total numbers somewhere between 29,500 and 50,000.

"Three days ago, there were 10 bonobos face-down in the building, breathing really hard," says Vanessa Woods, a bonobo researcher at Duke University in Durham, North Carolina, who is currently at the sanctuary. "We've never seen anything like it before."

At least 4 animals have died from the illness out of a total of 60 living in Lola Ya Bonobo reserve. The 40-hectare forest sanctuary is just outside of the capital city of Kinshasa and houses bonobos orphaned by the bush meat trade.

A flu outbreak raced through the human population of Kinshasa in February 2009, and Woods suspects sanctuary visitors spread the illness to the animals. "They get 30 000 Congolese visitors a year, and most of them are school children," she says.

Scientists studying wild chimpanzees in Cote d'Ivoire's Tai National Park have documented disease outbreaks there, including a respiratory illness likely acquired from humans.

As a result, researchers at Tai now keep their distance from chimpanzees and wear face masks to contain the spread of pathogens.

The bonobo sanctuary's animals are isolated from wild populations, so there is no chance the disease will spread, Woods says.

She and her colleagues have quarantined some sick animals and are keeping a close eye on the rest. "The worst seems to have passed, but you just don't know."

International, Mammals (The Yomiuri Shimbun, April 7): 10 wild raccoons have been found with signs of previous H5N1 bird flu infections, according to a joint study by Tokyo University and Yamaguchi University.

This is the 1st time mammals in this country have been found with bird flu virus antibodies, which develop as a result of infection. Before the discovery, only birds had been found [here] with bird flu antibodies.

The research team, which presented a paper on its findings at a conference of the Japanese Society of Veterinary Science in Utsunomiya on Saturday [4 Apr 2009], warned that infected raccoons could introduce the virus into chicken farms and noted that countermeasures were needed.

It is believed that the H5N1 strain of the bird flu virus is highly likely to mutate into a new type of influenza. In Japan, there have previously been reports of domestic chickens, wild whooper swans, jungle crows and mountain hawk-eagles infected with the virus.

The research team collected and examined blood from 988 raccoons captured since 2005 at 3 locations in western Japan and one location in eastern Japan. In the blood of 10 raccoons from 3 of the locations, the team found antibodies that had developed after past H5N1 infections. In 2 of the 3 places, not even birds had been found with the antibodies before this time.

According to Taisuke Horimoto, an associate professor of Tokyo University's Institute of Medical Science, raccoons do not live in packs. He said the blood test this time showed that in comparison with other infectious diseases, the proportion of animals found with the H5N1 antibodies was low.

The researchers think the 10 raccoons likely were not infected by other raccoons, but by eating the carcasses of infected birds or inheriting the antibodies from a parent at birth.

Raccoons are found throughout the nation. Many of them are descended from abandoned pets or have run away from zoos.

Michigan Wild Bird Surveillance (USDA, as of April 9): For the 2008 testing season, 2105 Michigan samples have been taken so far, comprised of 327 live birds, 1218 hunter-killed birds, 35 morbidity or mortality samples and 525 environmental samples.

H5N1 subtype H5N1 has not been recovered from any Michigan samples tested to date, or from the 78,210 birds or environmental samples tested nationwide for the 2008 testing season, which will run from April 1, 2008 - March 31, 2009. For more information, visit the National H5N1 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 Vagasky at VagaskyS@Michigan.gov with any questions regarding this newsletter or to be added to the weekly electronic mailing list.

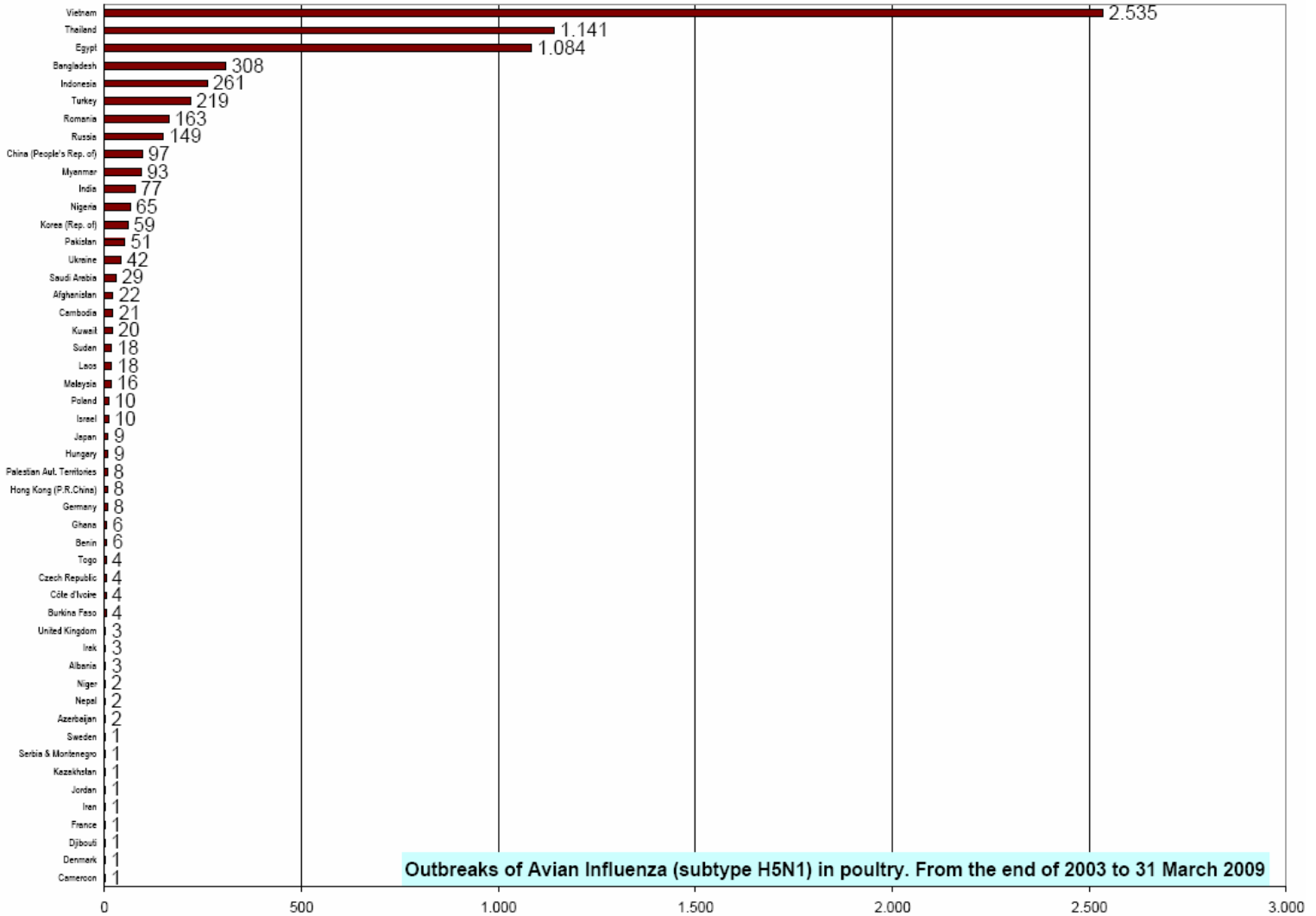
Contributors

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Table 1. H5N1 Influenza in Poultry (Outbreaks up to March 31, 2009)

(Source: http://www.oie.int/download/AVIAN%20INFLUENZA/A_AI-Asia.htm Downloaded 4/1/09)



Outbreaks of Avian Influenza (subtype H5N1) in poultry. From the end of 2003 to 31 March 2009

Table 2. H5N1 Influenza in Humans (Cases up to April 8, 2009)

(http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_04_08/en/index.html Downloaded 4/8/2009)

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	12	0	63	23
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	3	3	110	55
Total	4	4	46	32	98	43	115	79	88	59	44	33	22	7	417	257