# 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 continues to decline, but facility outbreaks due to pandemic H1N1 are being reported across the state.
- **National Surveillance:** 97% of isolated influenza viruses are the pandemic A H1N1 strain.
- **International Surveillance:** WHO discontinues individual case counts of pandemic A H1N1 influenza.

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

**Michigan (MDCH):** MDCH will no longer update the table of confirmed and probable H1N1 cases by county. Instead, we are moving to aggregate flu reporting, which includes flu-like illness and confirmed and probable cases of seasonal and novel influenza. Beginning the week ending June 20, 2009, this aggregate flu report will be updated every Tuesday by 5:00 pm at the following website: http://www.michigan.gov/documents/mdch/20090623_5pm_FLI_283516_7.pdf. As of July 11, 1973 cases of flu-like illness and confirmed and probable cases of seasonal and novel influenza, including 8 deaths, 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/swineflu for additional information. Local health departments can find additional guidance documents on the MI-HAN homepage.

**National (CDC):** As of July 10, 2009, 11:00am ET, the Centers for Disease Control and Prevention (CDC) is reporting 37,246 confirmed human infections, including 211 deaths, in the United States. These cases are being reported from 50 states, the District of Columbia, Guam, Puerto Rico and the Virgin Islands. 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, please visit the CDC's website at www.cdc.gov/h1n1flu/.

**International (WHO):** On July 16, 2009, WHO released a statement (available at http://www.who.int/csr/disease/swineflu/notes/h1n1_surveillance_20090710/en/index.html) that "The increasing number of cases in many countries with sustained community transmission is making it extremely difficult, if not impossible, for countries to try and confirm them through laboratory testing. Moreover, the counting of individual cases is now no longer essential in such countries for monitoring either the level or nature of the risk posed by the pandemic virus or to guide implementation of the most appropriate response measures."

"….WHO will no longer issue the global tables showing the numbers of confirmed cases for all countries. However, as part of continued efforts to document the global spread of the H1N1 pandemic, regular updates will be provided describing the situation in the newly affected countries. WHO will continue to request that these countries report the first confirmed cases and, as far as feasible, provide weekly aggregated case numbers and descriptive epidemiology of the early cases. For countries already

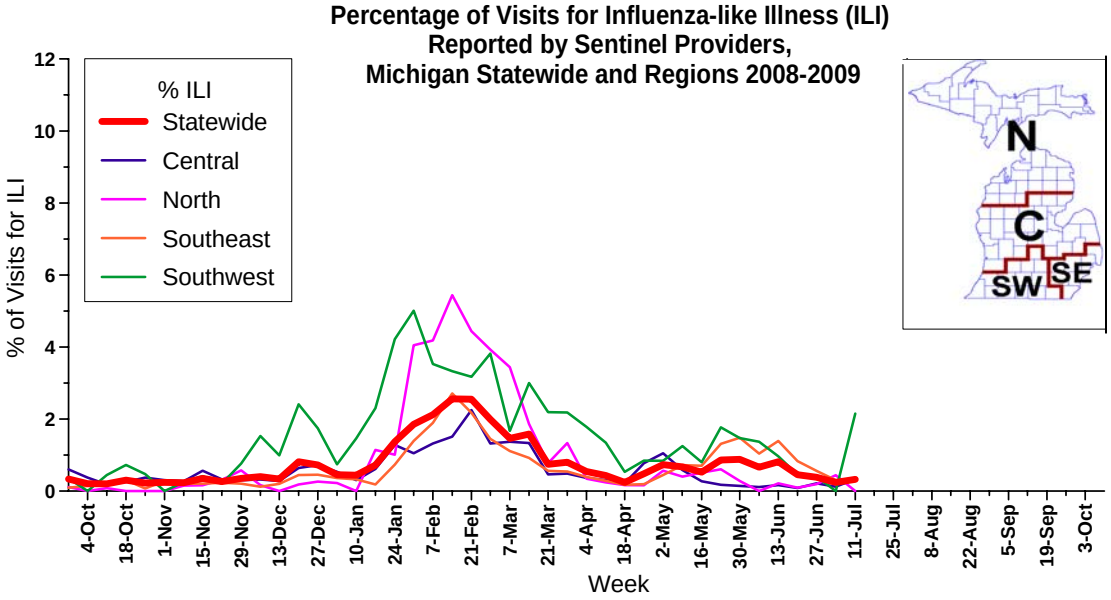
experiencing community-wide transmission, the focus of surveillance activities will shift to reporting against the established indicators for the monitoring of seasonal influenza activity. Those countries are no longer required to submit regular reports of individual laboratory-confirmed cases to WHO."

**Michigan Disease Surveillance System:** The week ending July 11 saw aggregate flu-like numbers and individual seasonal reports holding steady near baseline levels, while novel influenza reports were decreasing but slightly above baseline levels. All numbers, except for the slight increase in novel influenza reports, are near summer baseline levels consistent with the numbers seen this time last year.

**Emergency Department Surveillance:** Emergency department visits from both constitutional and respiratory complaints decreased slightly compared to last week's numbers. Both constitutional and respiratory numbers are comparable to numbers seen at this time last year. Three constitutional alerts in the N(1) and SW(2) Influenza Surveillance Regions and one respiratory alert in the C(1) Influenza Surveillance Region were generated last week.

**Over-the-Counter Product Surveillance:** Overall, OTC product sales were steady last week. All indicator sales held steady near last week's levels. Children's electrolytes and thermometer sales, though generally steady, have been trending slightly downward over the last few weeks. Indicator levels are comparable to those seen at this time last year.

**Sentinel Provider Surveillance (as of July 16):** During the week ending July 11, 2009, the proportion of visits due to influenza-like illness (ILI) slightly increased compared to the previous week at 0.3% overall; 20 patient visits due to ILI were reported out of 6,106 office visits. Twenty-four sentinel sites provided data for this report. The increased level of ILI activity for this time of year 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 two surveillance regions: Central (0.3%) and Southwest (2.2%); remained the same in the Southeast (0.3%) region and decreased in the North (0.0%) region. The increased ILI activity for the Southwest region should be interpreted with caution; only one site from that region reported for the week. 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 16):** 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)

6 sentinel laboratories reported for the week ending July 11, 2009. 2 labs (SW, C) reported sporadic to increasing influenza A positives and 4 labs reported zero influenza A positives (SW, C, N). 5 labs reported zero influenza B positives (SW, C, N) with one lab reporting sporadic influenza B positives (SW).

**Michigan Influenza Antigenic Characterization (as of July 16):** 35 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.

2 Michigan pandemic influenza A (H1N1) specimens have been antigenically characterized by the CDC; both of these specimens 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 16):** 35 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 35 viruses were resistant to oseltamivir (Tamiflu®) and sensitive to zanamivir, amantadine and rimantadine. These viruses were collected in the SE(15), SW(13), C(1) and N(6) Influenza Surveillance Regions. 3 influenza A/H3N2 isolates, collected in the C(2) and N(1) Regions, have been tested for antiviral resistance; these viruses were resistant to the adamantanes (amantadine and rimantadine) and sensitive to oseltamivir and zanamivir.

2 Michigan pandemic influenza A (H1N1) specimens have been evaluated by CDC for resistance to the adamantane class of antiviral medications; both of these specimens were resistant. One of the specimens was evaluated for resistance to oseltamivir and zanamivir; it was 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 16):** 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 July 16):** 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], July 10):** During week 26 (June 28-July 4, 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. One thousand five hundred five (26.1%) 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. Over 97% 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 equal to the epidemic threshold. Five influenza-associated pediatric deaths were reported and all 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. Nine states reported geographically widespread influenza activity, 12 states and Puerto Rico reported regional influenza activity, 10 states and the District of Columbia reported local influenza activity, 18 states reported sporadic influenza activity, and one state did not report.

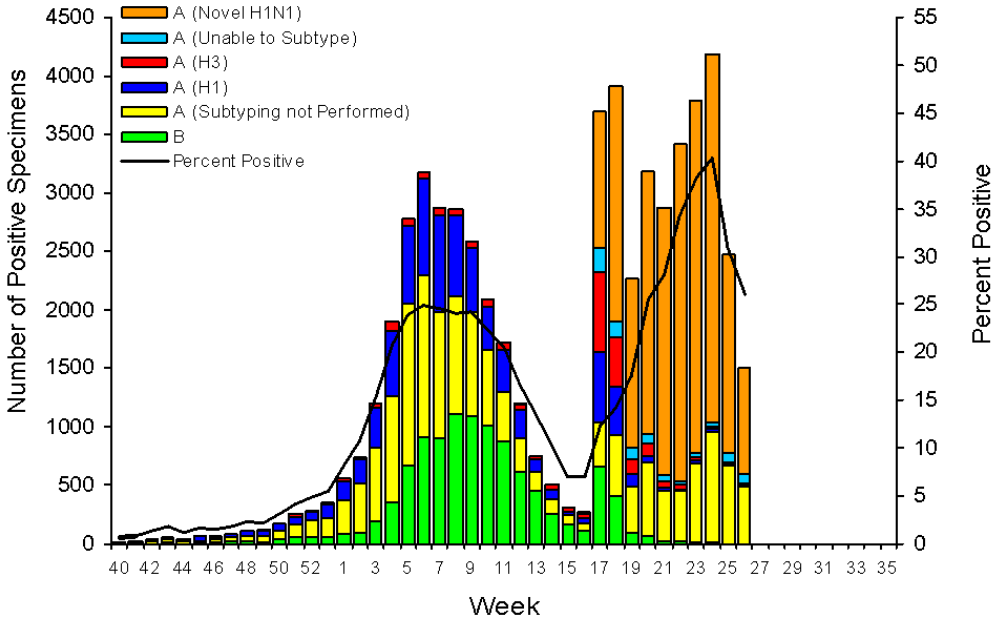
Since October 1, 2008, 1,066 seasonal influenza A (H1N1), 198 influenza A (H3N2), and 585 influenza B viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Also, 1,068 seasonal influenza A (H1N1) and 206 influenza A (H3N2) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). Two hundred sixty-four novel influenza A (H1N1) viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Two hundred forty-two 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.

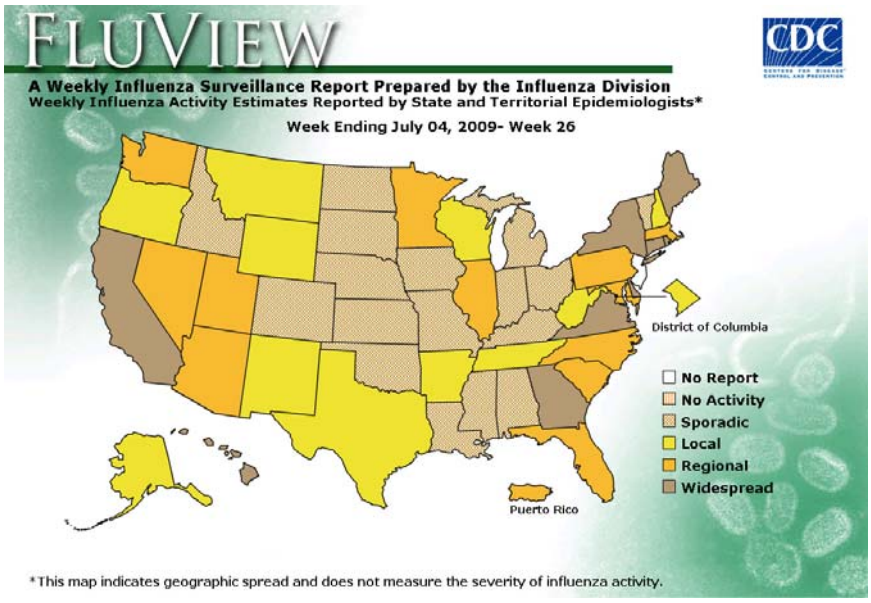
| | **Isolates tested (n)** | **Resistant Viruses, Number (%)** | | **Isolates tested (n)** | **Resistant Viruses, Number (%)** |
|---|---|---|---|---|---|
| | | **Oseltamivir** | **Zanamivir** | | **Adamantanes** |
| **Seasonal Influenza A (H1N1)** | 1,066 | 1,061 (99.5%) | 0 (0) | 1,068 | 6 (0.6%) |
| **Influenza A (H3N2)** | 198 | 0 (0) | 0 (0) | 206 | 206 (100%) |
| **Influenza B** | 585 | 0 (0) | 0 (0) | N/A* | N/A* |
| **Novel Influenza A (H1N1)** | 264 | 0 (0) | 0 (0) | 242 | 242 (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

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






**International (WHO, June 25):** *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 25-26, widespread outbreaks in the southern hemisphere continued to be reported in Brazil due to H1. Regional H3 outbreaks were once again reported in South Africa with low levels of H1 and B circulating. In Australia, regional activity occurred with H3 and H1 cocirculating as well as sporadic B. New Zealand experienced local outbreaks of H3 and H1 while sporadic B activity was also detected. Local outbreaks of influenza B have been reported by Madagascar, with low levels of H3 and H1.

Sporadic seasonal influenza activity was observed in Belgium (A), Cameroon (H3), Canada (A), China (H1,H3,B), Denmark (A,B), Ecuador (H3), El Salvador (A,B), Greece (H3,B), Iran (B), Italy (H3), Japan (H3,B), Morocco (A), Norway (B), Republic of Korea (H3), Réunion (B), Romania (H1), Russian Federation (H1,H3,B), Slovenia (H3), Sri Lanka (H1), Tunisia (H1,B) and United States of America (H1,H3,B).

Albania, Algeria, Azerbaijan, Belarus, Bulgaria, Estonia, Germany, Kazakhstan, Latvia, Lithuania, Mongolia, Netherlands, Oman, Poland, Serbia, Slovakia, Spain, Sweden and Turkey reported no activity.

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MDCH reported **LOCAL INFLUENZA ACTIVITY** to the CDC for the week ending July 11, 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.

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## Avian and Novel Influenza Activity

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

**Michigan, Human (Reuters Alertnet [edited], July 11):** People who are obese but otherwise healthy may be at special risk of severe complications and death from the new influenza pandemic (H1N1) 2009 virus, U.S. researchers reported on Friday [10 Jul 2009]. They described the cases of 10 patients at a Michigan hospital who were so ill they had to be put on ventilators. 3 died. 9 of the 10 were obese, 7 were severely obese, including 2 of the 3 who died.

The study, published in advance in the Centers for Disease Control and Prevention's (CDC) weekly report on death and disease, also suggests doctors can safely double the usual dose of oseltamivir, Roche AG's antiviral drug sold under the Tamiflu brand name.

"What this suggests is that there can be severe complications associated with this virus infection, especially in severely obese patients," said CDC virus expert Dr. Tim Uyeki. "And 5 of these patients had ... evidence of blood clots in the lungs. This has not been previously known to occur in patients with severe influenza virus infections," Uyeki said in a telephone interview.

Dr. Lena Napolitano of the University of Michigan Medical Center and colleagues studied the cases of 10 patients admitted to the university's intensive care unit with severe acute respiratory distress syndrome caused by infection with H1N1. "Of the 10 patients, 9 were obese (body mass index [BMI] more than 30), including 7 who were extremely obese (BMI more than 40)," they wrote in their report.

Their study was not designed to see if obesity or anything else poses a special risk factor for flu. But the researchers were surprised to see that 7 of the 10 patients were extremely obese. 9 had multiple organ failure, which can be seen in influenza, but 5 had blood clots in the lungs, and 6 had kidney failure. None has fully recovered, the researchers said.

The H1N1 swine flu virus 1st emerged in Mexico in March [2009] and was spreading out of control in the United States by the time it was identified at the end of April. The World Health Organization declared a pandemic in June. While it is causing moderate illness, all influenza viruses can be deadly and this one is no exception. It has killed close to 500 people globally, more than 200 in the United States alone.

However, the new virus has a slightly different pattern from seasonal flu -- it spreads in the summer months, attacks young adults and older children, and may affect the body slightly differently. As with H5N1 avian influenza, which only rarely attacks people, patients seem to survive better if they get Tamiflu for longer than the usual 5-day treatment course, Uyeki said. "We don't know if it is necessary for a higher dose of the drug to be given to patients who are obese," he said.

"The high prevalence of obesity in this case series is striking," the CDC's commentary accompanying the report reads. "Whether obesity is an independent risk factor for severe complications of novel influenza A (H1N1) virus infection is unknown. Obesity has not been identified previously as a risk factor for severe complications of seasonal influenza."

**Michigan Wild Bird Surveillance (USDA, as of July 16):** For the 2009 testing season (April 1, 2009 - March 31, 2010), HPAI subtype H5N1 has not been recovered from any of the Michigan samples tested to date, which includes 26 live wild bird specimens. HPAI subtype H5N1 has not been recovered from the 758 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.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 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)

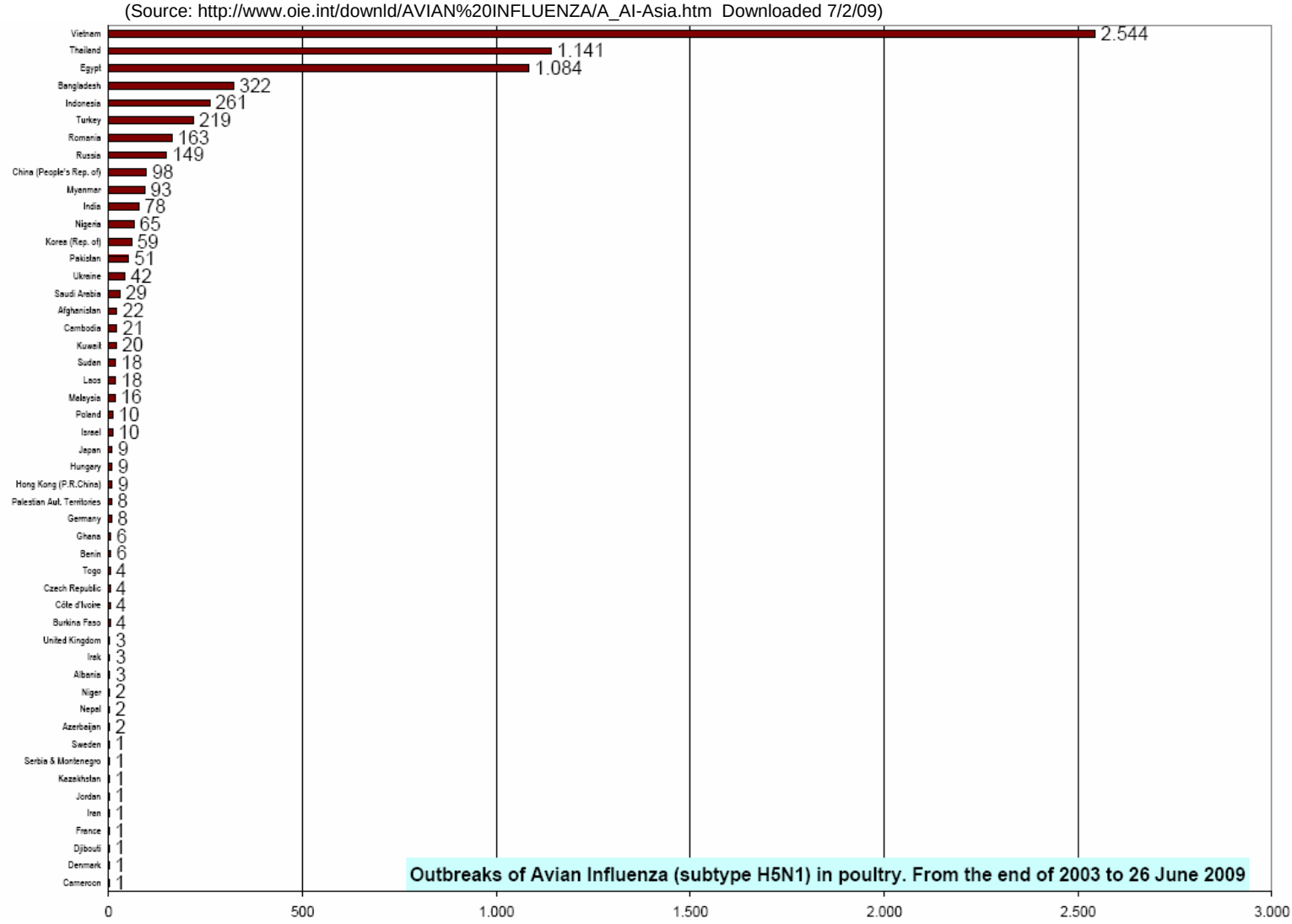


**Table 2. H5N1 Influenza in Humans (Cases up to July 1, 2009)**

(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 |