



MI Flu Focus

Influenza Surveillance Updates
Bureaus of Epidemiology and Laboratories

Michigan Department
of Community Health



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Current Influenza Activity Levels:

- **Michigan:** Sporadic activity
- **National:** During April 28-May 4, influenza activity remained low in the United States

Updates of Interest

- **International:** WHO is reporting 40 human cases of nCoV from 6 countries (France, Germany, Jordan, Qatar, Saudi Arabia, UK)

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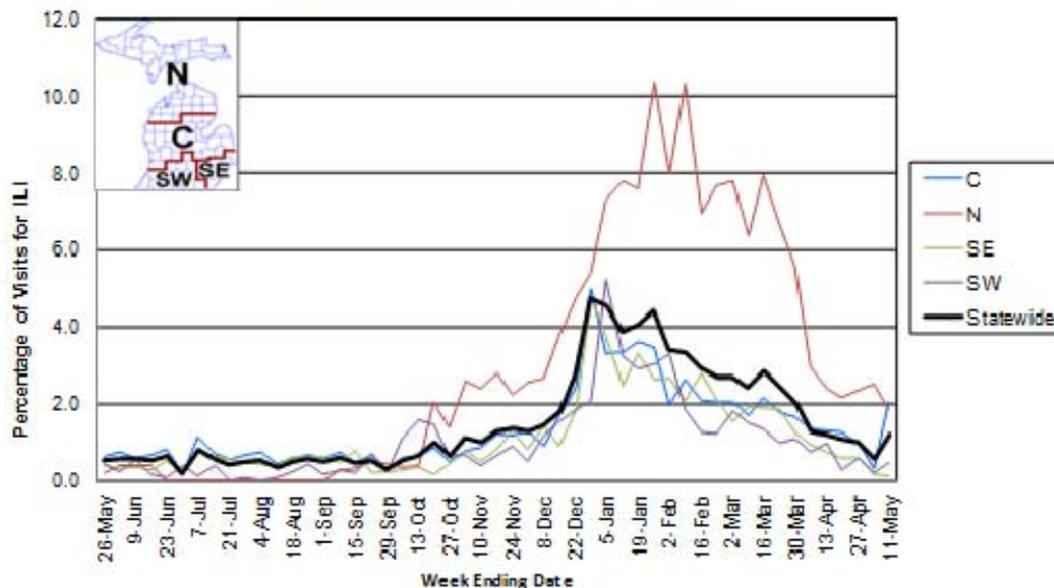
Influenza Surveillance Reports

Michigan Disease Surveillance System (as of May 16): MDSS data for the week ending May 11th indicated that compared to levels from the previous week, individual reports slightly increased, while aggregate influenza reports decreased. Aggregate reports are slightly lower than levels seen during the same time period last year, while individual reports are slightly higher. The increase in individual reports appears to be partially related to late reports being entered into the MDSS.

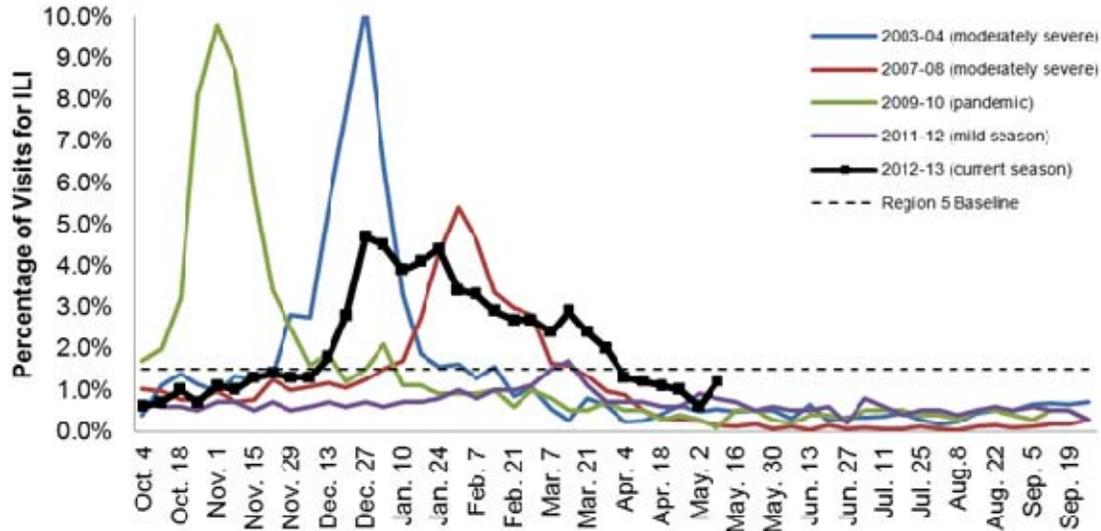
Emergency Department Surveillance (as of May 16): Compared to levels from the week prior, emergency department visits from constitutional complaints decreased slightly, while respiratory complaints remained steady. Both constitutional and respiratory complaints are similar to levels reported during the same time period last year. In the past week, there were 3 constitutional alerts in the C(2) and N(1) Influenza Surveillance Regions and 4 respiratory alerts in the SW(1) and C(3) Regions.

Sentinel Provider Surveillance (as of May 16): During the week ending May 11, 2013, the proportion of visits due to influenza-like illness (ILI) increased to 1.2% overall; this is below the regional baseline (1.5%). A total of 89 patient visits due to ILI were reported out of 7,409 office visits. Data were provided by 24 sentinel sites from the following regions: Central (9), North (3), Southeast (9) and Southwest (3). ILI activity increased in two regions: C (2.0%) and SW (0.5%). ILI activity decreased in two regions: N (1.8%) and SE (0.1%). Please Note: these rates may change as additional reports are received.

Percentage of Visits for Influenza-like Illness (ILI)
Reported by Sentinel Providers, Statewide and Regions
2011-2012 and 2012-13 Flu Seasons



Percentage of Visits for Influenza-like Illness (ILI) Reported by the US Outpatient Influenza-like Illness Surveillance Network (ILINet): Michigan, Select Seasons



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 Stefanie DeVita at 517-335-3385 or DeVitaS1@michigan.gov for more information.

Hospital Surveillance (as of May 11): The CDC Influenza Hospitalization Surveillance Project provides population-based rates of severe influenza illness through active surveillance and chart review of lab-confirmed cases, starting on October 1, 2012, in the Clinton, Eaton, Genesee, and Ingham counties. Reporting for the season has concluded. There were 258 influenza hospitalizations (168 adult, 90 pediatric) within the catchment area. The incidence rate for adults was 24.7 hospitalizations per 100,000 population and for children was 43.0 hospitalizations per 100,000.

The MDCH Influenza Sentinel Hospital Network monitors influenza hospitalizations reported voluntarily by hospitals statewide. Reporting for the 2012-13 influenza season has concluded. 437 hospitalizations (278SE, 21SW, 64C, 74N) were reported by 12 hospitals during the 2012-13 season.

Laboratory Surveillance (as of May 11): During May 5-11, no positive influenza results were reported by MDCH. For the 2012-13 season (starting Sept. 30, 2012), MDCH has identified 679 influenza results:

- Influenza A(H3): 500 (124SE, 169SW, 169C, 38N)
- Influenza A(H1N1)pdm09: 35 (19SE, 4SW, 9C, 3N)
- Influenza B: 152 (30SE, 31SW, 74C, 18N)
- Parainfluenza: 8 (3SW, 1C, 4N)
- RSV: 1 (1N)
- hMPV: 2 (2SW)

10 sentinel labs (SE, SW, C, N) reported for the week ending May 11, 2013. 2 labs (SE, SW) reported sporadic flu A activity. 1 lab (SE) reported low flu B activity. No labs reported parainfluenza activity. 5 labs (SE, SW, C, N) reported sporadic RSV activity. 2 labs (SW) reported sporadic HMPV activity. Testing volumes are low except for a few SE sites.

Michigan Influenza Antigenic Characterization (as of May 16): For the 2012-13 season, 113 Michigan influenza B specimens have been characterized at MDCH BOL. 94 specimens are B/Wisconsin/01/2010-like, matching the B component of the 2012-13 influenza vaccine. 19 influenza B specimens were characterized as B/Brisbane/60/2008-like, which is not included in the 2012-13 vaccine.

Michigan Influenza Antiviral Resistance Data (as of May 16): For the 2012-13 season, 32 influenza A/H3 specimens and 25 influenza A(H1N1)pdm09 specimens have been tested at the MDCH BOL for antiviral resistance. None of the influenza isolates tested have been resistant.

CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza, which are available at <http://www.cdc.gov/flu/professionals/antivirals/index.htm>.

Influenza-associated Pediatric Mortality (as of May 16): 1 pediatric influenza death associated with influenza A/H3 infection is being reported this week from an infant in the SW Region; the death occurred during the first week of January but was just confirmed. 7 pediatric influenza-associated influenza mortalities (3 A/H3, 4B) have been reported for the 2012-13 season.

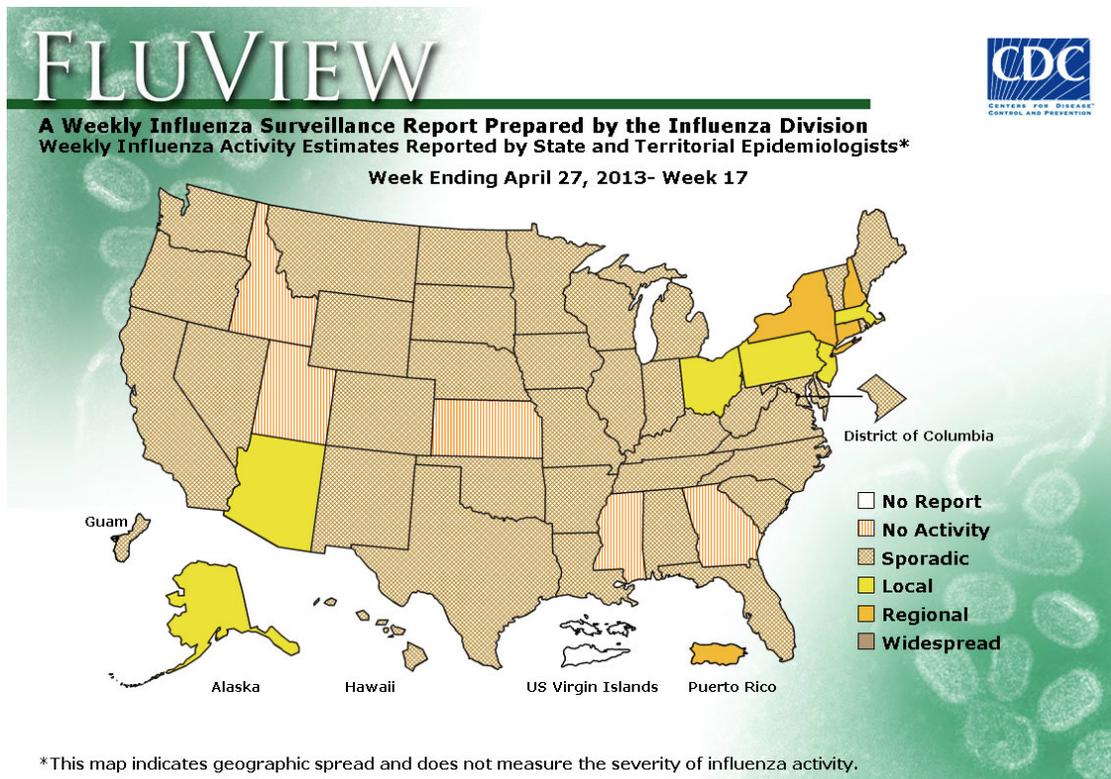
CDC requires reporting of flu-associated pediatric deaths (<18 yrs), including pediatric deaths due to an influenza-like illness with lab confirmation of influenza or any unexplained pediatric death with evidence of an infectious process. Contact MDCH immediately for proper specimen collection. The MDCH protocol is at www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf.

Influenza Congregate Settings Outbreaks (as of May 16): 111 respiratory outbreaks (22SE, 29SW, 41C, 19N) have been reported to MDCH during the 2012-13 season; testing results are listed below.

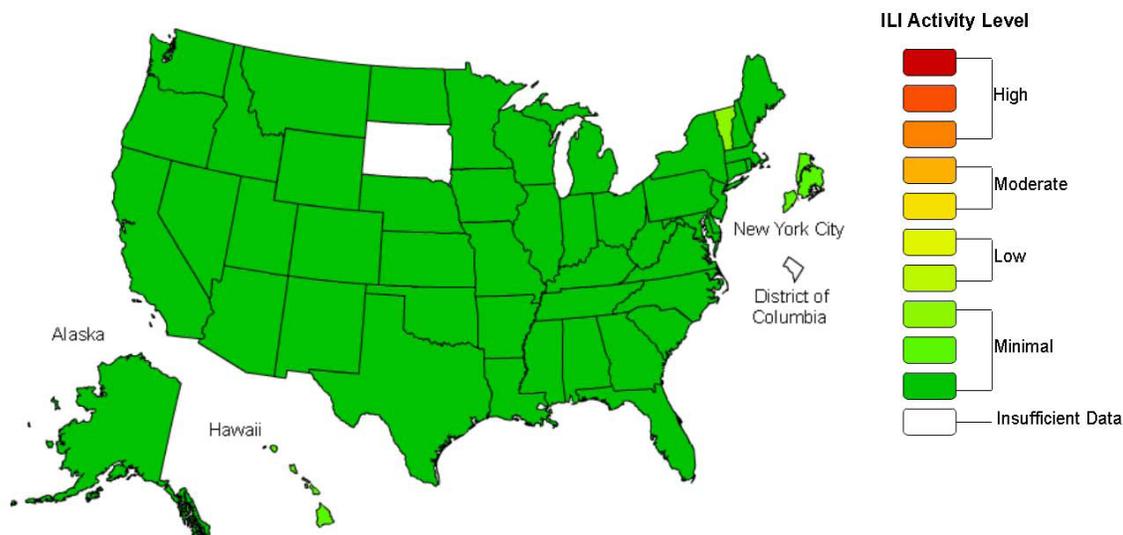
- Influenza A/H3: 16 (7SW, 9C)
- Influenza A: 55 (10SE, 13SW, 20C, 12N)
- Influenza B: 8 (1SE, 3SW, 2C, 2N)
- Influenza A and B: 2 (1SE, 1SW)
- Influenza A/H3 and B: 1 (1C)
- Influenza positive: 4 (1SE, 1SW, 2C)
- Influenza and RSV positive: 1 (1C)
- Influenza B and RSV positive: 1 (1SE)
- Negative/no testing: 23 (8SE, 4SW, 6C, 5N)

National (CDC [edited], May 10): During week 18 (April 28-May 4, 2013), influenza activity remained low in the United States. Of 3,048 specimens tested and reported by collaborating laboratories, 125 (4.1%) were positive for influenza. The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. One pediatric death was reported. A cumulative rate for the season of 44.2 laboratory-confirmed influenza-associated hospitalizations per 100,000 population was reported. Of reported hospitalizations, 50% were among adults 65 years and older. The proportion of outpatient visits for influenza-like illness (ILI) was 0.9%. This is below the national baseline of 2.2%. All 10 regions reported ILI below region-specific baseline levels. 49 states and New York City experienced minimal activity, and the District of Columbia and 1 state had insufficient data. 5 states reported regional influenza activity; 3 states reported local influenza activity; Guam, Puerto Rico, and 37 states reported sporadic influenza activity; 5 states reported no influenza activity, and the District of Columbia and the U.S. Virgin Islands did not report.

The complete FluView report is available online at <http://www.cdc.gov/flu/weekly/fluactivity.htm>.



**Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2012-13 Influenza Season Week 18 ending May 04, 2013**



This map uses the proportion of outpatient visits to healthcare providers for influenza-like illness to measure the ILI activity level within a state. Therefore, outbreaks occurring in a single city could cause the state to display high activity levels. Data collected in ILINet may disproportionately represent certain populations within a state, and therefore, may not accurately depict the full picture of influenza activity for the whole state. Data displayed on this map are based on data collected in ILINet, whereas the State and Territorial flu activity map are based on reports from state and territorial epidemiologists.

International (WHO [edited], May 10): The influenza season is gradually coming to an end with inter seasonal levels seen in much of North America, Europe, and northern Asia though low level persistent transmission was still observed in a few countries. The persistence of transmission at low levels in the northern hemisphere temperate regions has been associated with increasing numbers of influenza type B virus appearing late in the season across North America and parts of Europe. Prior to this, influenza A(H3N2) was the most commonly detected virus in North America, A(H1N1)pdm09 in Europe, and both in varying proportions in different countries of northern Asia. Low levels of influenza activity continued to be reported across the tropical regions of the world and activity in countries of the southern hemisphere remained at inter-seasonal levels. The majority of influenza A viruses characterized so far this season have been antigenically related to those contained in the current trivalent vaccine. Among the B viruses characterized, those that were of the Yamagata lineage were antigenically related to the viruses recommended for the trivalent vaccine. Although 10-30% of reported B viruses were of the Victoria lineage. Only very low numbers of oseltamivir and zanamivir resistant viruses have been detected so far this season. In China, new cases of H7N9 have been reported with 131 cases and 32 deaths to date, for more information see link below: A summary review of the Northern Hemisphere influenza season is expected to be published in the World Epidemiological Report on 31 May 2013.

The entire WHO report is available online at www.who.int/influenza/surveillance_monitoring/updates/latest_update_GIP_surveillance/en/index.html.

MDCH reported SPORADIC INFLUENZA ACTIVITY to CDC for the week ending May 11, 2013.

For additional flu vaccination and education information, the MDCH *FluBytes* newsletter is available at http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html.

Novel Influenza Activity and Other News

WHO Pandemic Phase: Post-pandemic – Influenza disease activity has returned to levels normally seen for seasonal influenza. It is expected that the pandemic virus will behave as a seasonal influenza A virus. It is important to maintain surveillance and update pandemic preparedness/response plans accordingly.

International, Human (WHO [edited], May 10): WHO RISK ASSESSMENT, Human infections with avian influenza A(H7N9) virus, 10 May 2013

Summary: A total of 131 confirmed cases of human infection with avian influenza A(H7N9) virus have been reported to WHO by China National Health and Family Planning Commission and one case by the Taipei Centers for Disease Control (Taipei CDC). Although cases have been reported in both sexes and across a wide range of ages, most cases have occurred among middle-aged and older men. Thirty-two people have died, and most of the other cases are considered severe. In addition to the case reported by Taipei CDC (with a history of recent travel from Jiangsu), cases have been reported from Anhui, Fujian, Henan, Hunan, Jiangsu, Jiangxi, Shandong and Zhejiang, and the municipalities of Beijing and Shanghai. Much remains unknown about this virus, including the animal reservoir(s) in which it is circulating, the main exposures and routes of transmission, and the scope of the spread of this virus among people and animals. Investigations are ongoing and evidence is inconclusive. Nevertheless, human infection appears to be related to exposure to live poultry or contaminated environments because:

- The virus in humans is genetically similar to that found in animals and the environment (live bird markets).
- Most human cases (approximately three out of four patients) report a history of exposure to animals, mostly chickens.
- The virus has been detected in poultry in live bird markets.
- The number of human cases appears to have decreased after closure of live animal markets.

Whether other potential reservoirs of this virus may exist, including in other domestic and wild bird species, and mammalian species, has not yet been determined. And although two family clusters have been reported, there is no evidence of sustained human-to-human transmission:

- Monitoring and testing of contacts (>2000 people) of confirmed cases has detected few infections.
- Testing of more than 20,000 people with influenza-like illness (ILI) in March and April has confirmed only six infections with H7N9. This finding suggests that milder cases of H7N9 infection are not occurring in large numbers.

This is the first time human infection with the avian influenza A(H7N9) subtype has been detected. Previously, sporadic cases of human infection with other influenza A(H7) viruses have been reported which were associated with outbreaks of infection in poultry. The few A(H7) human infections that have occurred generally resulted in mild illness and conjunctivitis, with the exception of one death.

Genetic and laboratory characterization of avian influenza A(H7N9) viruses isolated from humans indicates that:

- The virus contains a group of influenza virus genes from multiple origins.
- Some genetic changes, including amino acid substitutions associated with increased affinity to alpha 2-6 receptors, suggest that H7N9 may have greater ability to infect mammals, including humans, than other avian influenza viruses.
- Sequence variations among the genes of the isolates suggest that there has been more than one introduction of this virus from animal into humans.
- Genetically, these viruses are in general expected to be sensitive to the neuraminidase inhibitors oseltamivir and zanamivir, but resistant to the antiviral drugs amantadine and rimantadine.
- The isolates have a haemagglutinin structure that is associated with low pathogenicity in birds.

The virus has not been reported to cause severe disease in poultry. The absence of this signal limits the ability to easily detect the virus in birds, in contrast to avian influenza A(H5N1).

The full risk assessment is available online at

www.who.int/influenza/human_animal_interface/influenza_h7n9/RiskAssessment_H7N9_10May13.pdf.

International, Human (Eurosurveillance abstract, May 16): Han J, et al. Epidemiological link between exposure to poultry and all influenza A(H7N9) confirmed cases in Huzhou city, China, March to May 2013. Euro Surveill. 2013;18(20):pii=20481.

We analysed the association between influenza A(H7N9) confirmed cases and exposure to poultry in Huzhou city, China. All cases (n=12) had a history of direct exposure to poultry or live poultry markets. We detected A(H7N9)-positive poultry samples from each site that was epidemiologically associated with cases. None of the cases' close contacts tested positive. After closure of the markets, no new cases were identified, suggesting an epidemiological link between poultry exposure and A(H7N9) virus infection.

The full article is available online at <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20481>.

International, Human (WHO, May 15): The Ministry of Health in Saudi Arabia has informed WHO of an additional two laboratory-confirmed cases with infection of the novel coronavirus (nCoV).

The two patients are health care workers who were exposed to patients with confirmed nCoV. The first patient is a 45-year-old man who became ill on 2 May 2013 and is currently in a critical condition. The second patient is a 43-year-old woman with a coexisting health condition, who became ill on 8 May 2013 and is in a stable condition.

Although health care associated transmission has been observed before with nCoV (in Jordan in April 2012), this is the first time health care workers have been diagnosed with nCoV infection after exposure to patients. Health care facilities that provide care for patients with suspected nCoV infection should take appropriate measures to decrease the risk of transmission of the virus to other patients and health care workers. Health care facilities are reminded of the importance of systematic implementation of infection prevention and control (IPC).

Since the beginning of May 2013 to date, a total of 21 patients, including nine deaths, have been reported from the outbreak primarily linked to a health care facility in the Eastern part of Saudi Arabia. The government is conducting ongoing investigation into the outbreak.

From September 2012 to date, WHO has been informed of a global total of 40 laboratory confirmed cases of human infection with nCoV, including 20 deaths, from 6 countries (France, Germany, Jordan, Qatar, Saudi Arabia, United Kingdom).

Based on the current situation and available information, WHO encourages all Member States to continue their surveillance for severe acute respiratory infections (SARI) and to carefully review any unusual patterns.

Health care providers are advised to be vigilant among recent travelers returning from areas affected by the virus who develop severe SARI. Specimens from patients' lower respiratory tracts should be obtained for diagnosis where possible. Clinicians are reminded that nCoV infection should be considered even with atypical signs and symptoms in patients who are significantly immune compromised.

All Member States are reminded to promptly assess and notify WHO of any new case of infection with nCoV, along with information about potential exposures that may have resulted in infection and a description of the clinical course.

WHO does not advise special screening at points of entry with regard to this event nor does it currently recommend the application of any travel or trade restrictions.

WHO continues to closely monitor the situation.

The update is available online at http://www.who.int/csr/don/2013_05_15_ncov/en/index.html.

May 9 WHO update: http://www.who.int/csr/don/2013_05_09_ncov/en/index.html

May 12 WHO update: http://www.who.int/csr/don/2013_05_12/en/index.html

May 14 WHO update: http://www.who.int/csr/don/2013_05_14_ncov/en/index.html

International, Poultry (OIE [edited], May 9): Highly pathogenic avian influenza H7N9; China
Outbreak 1: Xiaobei Market, Fuqing, Fuzhou, FUJIAN
Date of start of the outbreak: 09/05/2013; Outbreak status: Continuing; Species: Birds; Cases: 1
Affected population: One sample from the environment was found positive out of 686 samples from Fujian

International, Poultry (OIE [edited], May 13): Highly pathogenic avian influenza H5N1; China
Outbreak 1: Qionglin village, Milin, Linzhi, TIBET
Date of start of the outbreak: 13/05/2013; Outbreak status: Continuing; Epidemiological unit: Village
Species: Birds; Susceptible: 407; Cases: 35; Deaths: 35; Destroyed: 372
Affected population: 341 chicken and 31 geese were destroyed.

International, Poultry (OIE [edited], May 13): Highly pathogenic avian influenza H5N1; Korea (Dem. People's Rep.)
Outbreak 1: Tudan Duck Factory, P'YONGYANG-SI
Date of start of the outbreak: 19/04/2013; Outbreak status: Continuing; Epidemiological unit: Farm

Species: Birds Susceptible: 164000

Affected population: Ducks in one of the 20 cages showed clinical signs on 19 April 2013 but recovered 3-4 days later. As mortality increased, samples were sent to the Central Veterinary Station on 2 May 2013. In total, one adult cage, 12 fattening cages and 7 duckling cages were infected. More than 2,000 adult ducks, 42,000 fattening ducks and 120,000 ducklings younger than 20 days were dead or killed.

International, Poultry (OIE [edited], May 16): Low pathogenic avian influenza H7N7; Germany Outbreak 1 (13-614-00008): Langförden, Vechta, NIEDERSACHSEN
Date of start of the outbreak: 15/05/2013; Outbreak status: Continuing; Epidemiological unit: Farm
Species: Birds; Susceptible: 13000; Cases: 10; Deaths: 0; Destroyed: 13000

International, Seals (PLOS ONE abstract, May 15): Goldstein T, et al. (2013) Pandemic H1N1 Influenza Isolated from Free-Ranging Northern Elephant Seals in 2010 off the Central California Coast. PLoS ONE 8(5): e62259. doi:10.1371/journal.pone.0062259

Interspecies transmission of influenza A is an important factor in the evolution and ecology of influenza viruses. Marine mammals are in contact with a number of influenza reservoirs, including aquatic birds and humans, and this may facilitate transmission among avian and mammalian hosts. Virus isolation, whole genome sequencing, and hemagglutination inhibition assay confirmed that exposure to pandemic H1N1 influenza virus occurred among free-ranging Northern Elephant Seals (*Mirounga angustirostris*) in 2010. Nasal swabs were collected from 42 adult female seals in April 2010, just after the animals had returned to the central California coast from their short post-breeding migration in the northeast Pacific. Swabs from two seals tested positive by RT-PCR for the matrix gene, and virus was isolated from each by inoculation into embryonic chicken eggs. Whole genome sequencing revealed greater than 99% homology with A/California/04/2009 (H1N1) that emerged in humans from swine in 2009. Analysis of more than 300 serum samples showed that samples collected early in 2010 (n = 100) were negative and by April animals began to test positive for antibodies against the pH1N1 virus (HI titer of $\geq 1:40$), supporting the molecular findings. In vitro characterizations studies revealed that viral replication was indistinguishable from that of reference strains of pH1N1 in canine kidney cells, but replication was inefficient in human epithelial respiratory cells, indicating these isolates may be elephant seal adapted viruses. Thus findings confirmed that exposure to pandemic H1N1 that was circulating in people in 2009 occurred among free-ranging Northern Elephant Seals in 2010 off the central California coast. This is the first report of pH1N1 (A/Elephant seal/California/1/2010) in any marine mammal and provides evidence for cross species transmission of influenza viruses in free-ranging wildlife and movement of influenza viruses between humans and wildlife.

The full article is available at www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0062259.

Michigan and National Wild Bird Surveillance (USDA, as of May 16): For the 2012 season (April 1, 2012-March 31, 2013), highly pathogenic avian influenza H5N1 has not been recovered from the 213 samples tested nationwide. For more information, visit <http://www.nwhc.usgs.gov/ai/>. To learn about avian influenza surveillance in wild birds or to report dead waterfowl, go to the Emerging Disease website at <http://www.michigan.gov/emergingdiseases>.

International Poultry and Wild Bird Surveillance (OIE): Reports of avian influenza activity, including summary graphs of avian influenza H5N1 outbreaks in poultry, can be found at the following website: http://www.oie.int/download/AVIAN%20INFLUENZA/A_AI-Asia.htm.

For questions or to be added to the distribution list, please contact Susan Peters at peterss1@michigan.gov

Contributors

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Table. H5N1 Influenza in Humans – As of April 26, 2013. http://www.who.int/influenza/human_animal_interface/EN_GIP_20130426CumulativeNumberH5N1cases.pdf. Downloaded 4/29/2013. Cumulative lab-confirmed cases reported to WHO. Total cases include deaths.

Country	2003-2006		2007		2008		2009		2010		2011		2012		2013		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Azerbaijan	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	1	0	0	0	0	0	2	0	3	0	1	1	7	1
Cambodia	6	6	1	1	1	0	1	0	1	1	8	8	3	3	10	8	31	27
China	22	14	5	3	4	4	7	4	2	1	1	1	2	1	2	2	45	30
Djibouti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Egypt	18	10	25	9	8	4	39	4	29	13	39	15	11	5	3	2	172	62
Indonesia	75	58	42	37	24	20	21	19	9	7	12	10	9	9	0	0	192	160
Iraq	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Lao PDR	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Myanmar	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Nigeria	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Pakistan	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1
Thailand	25	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	4
Vietnam	93	42	8	5	6	5	5	5	7	2	0	0	4	2	2	1	125	62
Total	263	158	88	59	44	33	73	32	48	24	62	34	32	20	18	14	628	374