



MI Flu Focus

Influenza Surveillance Updates
Bureaus of Epidemiology and Laboratories

Michigan Department
of Community Health



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Surveillance and Infectious Disease Epidemiology

May 8, 2014
Vol. 11; No. 27

Current Influenza Activity Levels:

- **Michigan:** Sporadic influenza activity
- **National:** During April 20-26, influenza activity continued to decrease in the United States

Updates of Interest:

- **International:** CDC announces the first case of MERS-CoV in the U.S.; the case had recent travel to Saudi Arabia.

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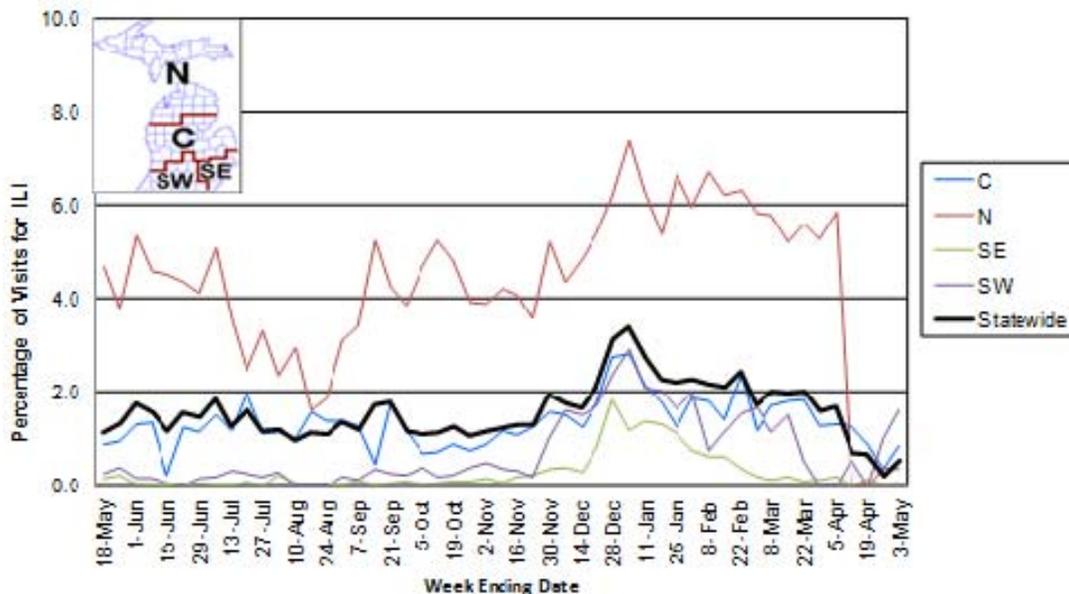
Influenza Surveillance Reports

Michigan Disease Surveillance System (as of May 8): MDSS influenza data for the week ending May 3, 2014 indicated that compared to levels from the previous week, individual reports remained steady, while aggregate reports slightly decreased. Aggregate reports are moderately lower than levels seen during the same time period last year, while individual reports are slightly lower.

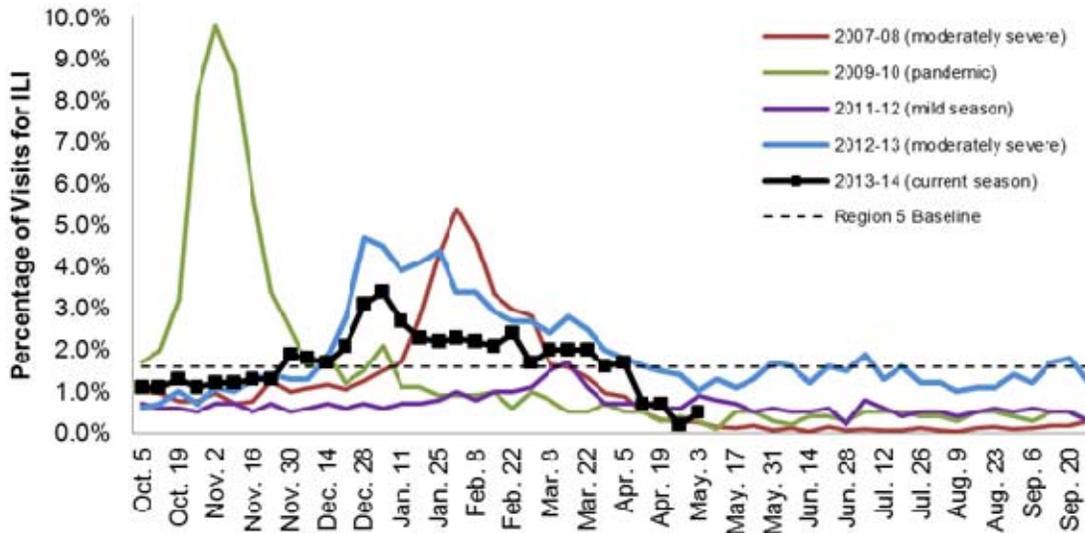
Emergency Department Surveillance (as of May 8): Emergency department visits due to both constitutional and respiratory complaints remained steady during the week ending May 3, 2014. Emergency department visits from both constitutional and respiratory complaints are similar to levels during the same time period last year. In the past week, there were 3 constitutional alerts in the SW(1) and N(2) Influenza Surveillance Regions and 6 respiratory alerts in the SW(3) and C(3) Regions.

Sentinel Provider Surveillance (as of May 8): During the week ending May 3, 2014, the proportion of visits due to influenza-like illness (ILI) increased to 0.5% overall; this is below the regional baseline (1.6%). A total of 47 patient visits due to ILI were reported out of 8,816 office visits. Data were provided by 22 sentinel sites from the following regions: Central (10), North (2), Southeast (9), and Southwest (1). ILI activity remained the same in one region: N (0.4%) and increased in three regions: C (0.8%), SE (0.1%), and SW (1.6%). 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
2013-14 Flu Season



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 8): 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, 2013 and ending April 30, 2014, for Clinton, Eaton, Genesee, and Ingham counties. 1 new case (1 adult) was identified since the last report. One previously reported case was a duplicate and removed from case counts. As of May 8th, there have been 232 influenza hospitalizations (69 pediatric, 163 adult) within the catchment area. Based on these counts, within the catchment area there are 33.0 pediatric influenza hospitalizations/100,000 population and 23.9 adult influenza hospitalizations/100,000.

The MDCH Influenza Sentinel Hospital Network monitors influenza hospitalizations reported voluntarily by hospitals statewide. Reporting for the 2013-14 season has concluded. 458 hospitalizations were reported during September 29, 2013-April 26, 2014.

Laboratory Surveillance (as of May 3): During April 27-May 3, 2 A/H3 (2SW) and 6 influenza B (4SW,2N) results were reported by MDCH Bureau of Laboratories. For the 2013-14 season (starting Sept. 29, 2013), MDCH has identified 381 positive influenza results:

- Influenza 2009 A/H1N1pdm: 340 (77SE,132SW,94C,38N)
- Influenza A/H3: 21 (11SE,7SW,3C)
- Influenza A unsubtypeable: 1 (1SE)
- Influenza A and B (LAIV recovery): 1 (1SE)
- Influenza B: 23 (8SE,7SW,5C,3N)
- RSV: 2 (2SW)
- Adenovirus: 2 (1SE,1SW)
- Parainfluenza: 2 (1SE,1SW)
- Human metapneumovirus: 4 (4SW)

10 sentinel labs (SE,SW,C) reported for the week ending May 3, 2014. 5 labs (SE,SW,C) reported low influenza A activity. 5 labs (SE,SW,C,N) reported low influenza B activity, with two labs (C,N) reporting only influenza B activity. 4 labs (SE,SW,C) reported sporadic RSV activity. 2 labs (SE,SW) reported sporadic parainfluenza activity. 2 labs (SE,SW) reported low hMPV activity. 1 lab (SW) had low adenovirus activity. Testing volumes are low to moderate.

Michigan Influenza Antigenic Characterization (as of May 8): For the 2013-14 season, 3 Michigan influenza specimens (1SE,2C) have been characterized at CDC as A/California/07/2009-like/H1N1/pdm09, matching the influenza A/H1N1pdm09 strain in the 2013-14 Northern Hemisphere vaccine. 2 specimens (2C) have been characterized at CDC and MDCH as B/Brisbane/60/2008-like, which is a B/Victoria lineage virus; it is not in the 2013-14 Northern Hemisphere trivalent vaccine but is in the quadrivalent vaccine. 11 specimens (8SE,2SW,1C) have been characterized at CDC and MDCH as B/Massachusetts/02/2012-like, which is a B/Yamagata lineage virus that is included in the 2013-14 trivalent and quadrivalent vaccines.

Michigan Influenza Antiviral Resistance Data (as of May 8): For the 2013-14 season, 123 2009 A/H1N1pdm (33SE,37SW,41C,12N) and 15 A/H3 (6SE,7SW,2C) influenza specimens have been tested at the MDCH BOL for antiviral resistance. None of the influenza specimens 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 8): 2 pediatric influenza-associated influenza mortalities (1SE,1C) have been reported to MDCH for the 2013-14 season.

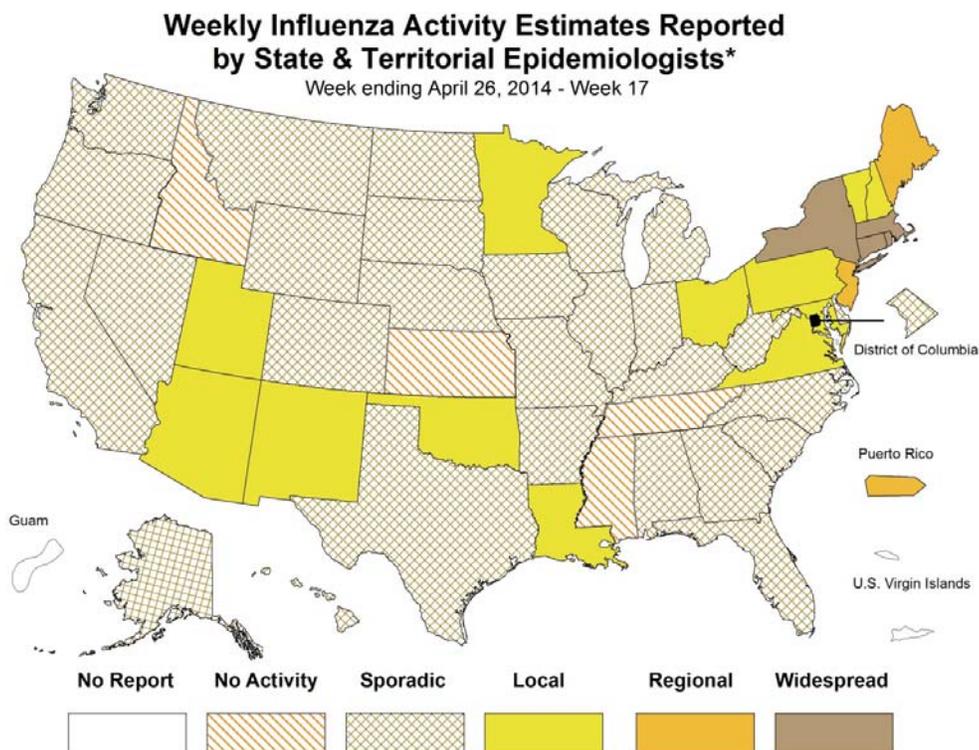
CDC requires reporting of flu-associated pediatric deaths (<18 yrs), including pediatric deaths due to an influenza-like illness with lab confirmation of influenza or any unexplained pediatric death with evidence of an infectious process. Contact MDCH immediately for proper specimen collection. The MDCH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

Influenza Congregate Settings Outbreaks (as of May 8): 1 new outbreak due to influenza B was reported in a long-term care facility (N) during the previous week. 1 previously reported long-term care facility outbreak (SW) was confirmed as influenza B during the previous week. 19 respiratory outbreaks (2SE,9SW,6C,2N) have been reported to MDCH during the 2013-14 season:

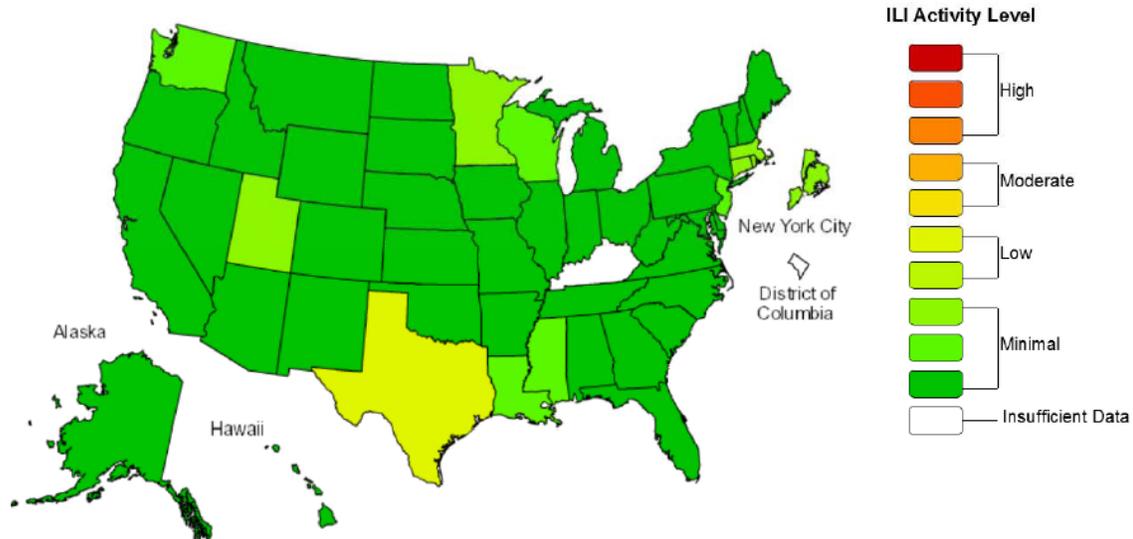
- Influenza 2009 A/H1N1pdm: 4 (1SE,2SW,1C)
- Influenza A/H3: 1 (1SW)
- Influenza A: 4 (3SW,1C)
- Influenza B: 2 (1SW,1N)
- Influenza positive: 1 (1SW)
- Human metapneumovirus: 2 (1SE,1N)
- RSV: 1 (1SW)
- Negative/no testing: 4 (4C)

National (CDC [edited], May 2): During week 17 (April 20-26, 2014), influenza activity continued to decrease in the United States. Of 4,031 specimens tested and reported during week 17 by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVS) collaborating laboratories, 500 (12.4%) were positive for influenza. The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. Two influenza-associated pediatric deaths were reported. A season-cumulative rate of 34.9 laboratory confirmed influenza-associated hospitalizations per 100,000 population was reported. The proportion of outpatient visits for influenza-like illness (ILI) was 1.5%, which is below the national baseline of 2.0%. Two of 10 regions reported ILI at or above region-specific baseline levels. One state experienced low ILI activity; 48 states and New York City experienced minimal ILI activity, and the District of Columbia and one state had insufficient data. The geographic spread of influenza in four states was reported as widespread; Puerto Rico and two states reported regional influenza activity; 12 states reported local influenza activity; the District of Columbia and 28 states reported sporadic influenza activity; four states reported no influenza activity, and Guam and the U.S. Virgin Islands did not report.

Complete weekly FluView reports are available online at: <http://www.cdc.gov/flu/weekly/>.



**Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2013-14 Influenza Season Week 17 ending Apr 26, 2014**



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 5): Globally, the northern hemisphere influenza season approached inter-seasonal levels in most countries. Influenza B continued to comprise the majority of late season detections in most regions, with the exception of Europe which reported consistently low influenza B activity. In North America, influenza levels slowly declined. In Europe, influenza activity continued to decrease, and most countries either approached or reached interseasonal levels. Influenza A(H3N2) was the predominant virus, followed by A(H1N1)pdm09 and very low detections of influenza B. In eastern Europe, influenza activity declined but remained slightly elevated compared to southwest and northern Europe, which peaked earlier in the season. In Eastern Asia, influenza activity approached interseasonal levels in most countries, and influenza B comprised the majority of influenza detections. In Tropical Asia, influenza activity continued to decline in most countries, although some variability was seen. In Northern Africa and Western Asia, influenza activity remained low in most countries, with influenza B the predominant virus detected. In the Southern Hemisphere, influenza activity was still low and influenza detections were sporadic.

The full report is 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 3, 2014.

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.

International, MERS-CoV (WHO [edited], May 5): On 2 May 2014, the US IHR National Focal Point reported the first laboratory confirmed Middle East respiratory syndrome coronavirus (MERS-CoV) infection in a male US citizen in his 60s, who lives and works in Riyadh, Saudi Arabia.

He traveled to the US from Riyadh to Chicago on 24 April 2014 via London Heathrow with travel from Chicago to Indiana by bus.

He reportedly worked in Riyadh. US health officials do not know at this time whether he directly cared for MERS-CoV confirmed cases and what infection control precautions were used. The CDC Team is working with the Indiana State Health Department to collect more data on the patient, including this information.

He began feeling unwell on or around 14 April 2014 with a low-grade fever without any respiratory symptoms. On 27 April 2014, he developed shortness of breath, cough, increasing fever, and mild runny nose. On 28 April 2014, he was seen in an emergency room. A chest x-ray showed infiltrates in the right lung base and he was admitted to hospital and placed in a private room. Negative pressure room and airborne precautions were reportedly implemented on 29 April 2014; full isolation (standard, contact, and airborne) precautions were implemented on 30 April 2014. A chest computed tomography on 29 April 2014 showed bilateral lung infiltrates. Currently the patient is stable with shortness of breath; he is not intubated.

CDC's Division of Global Migration and Quarantine (DGMQ) has been and continues to work with local, state, and international partners, as well as airlines and the bus company to obtain the passenger manifests from the two flights and information from the bus company to help identify, locate, and interview contacts.

This is the first report of an imported case of MERS-CoV in the United States and in the Americas Region.

The full report is available online at http://www.who.int/csr/don/2014_05_05_mers/en/.

A CDC press release is available online at www.cdc.gov/media/releases/2014/p0502-US-MERS.html.

International, MERS-CoV (WHO [edited], May 5): On 24 April 2014, the National IHR Focal Point (NFP) of Jordan reported a laboratory-confirmed case of Middle East Respiratory Syndrome coronavirus (MERS-CoV) infection in a 28 year-old male from Saudi Arabia.

He was identified through contact tracing activities and is asymptomatic. He is a relative of a previously reported case on 23 April 2014. Nasopharyngeal swab specimens were collected on 22 April 2014 and by 24 April 2014 the Central Public Health Laboratory confirmed MERS-CoV by PCR testing. The national authorities of Saudi Arabia have traced contacts for this case and the case reported on 22 April. No secondary cases were identified.

The full report is available online at http://www.who.int/csr/don/2014_05_05_mers_jordan/en/.

International, MERS-CoV (WHO [edited], May 7): On 3 and 6 May 2014, the IHR National Focal Point of Jordan notified WHO of two additional laboratory-confirmed cases of Middle East Respiratory Syndrome (MERS-CoV) infections.

The following details were provided to WHO on 3 May 2014 by the IHR National Focal Point for Jordan: A 28 year-old male health-care worker complained of a headache and sore throat on 22 April 2014. On 26 April 2014, chest X-rays showed normal findings and testing performed on 27 April 2014 were negative for MERS-CoV. On 30 April 2014, he developed a cough and fever and was admitted to hospital in Zarka on the same day. On 2 May 2014, a chest X-ray showed pneumonia and tested positive for MERS-CoV. The patient is currently in a stable condition.

He is reported to have had close contact with a previously reported case who was also hospitalized in Zarka.

The following details were provided to WHO on 6 May 2014 by the IHR National Focal Point for Jordan: A 56 year-old Jordanian male resident of Zarka and respiratory therapist at a private clinic was admitted to hospital on 28 April 2014 with pneumonia. On 3 May 2014, he developed acute respiratory distress syndrome and was transferred to the intensive-care unit. Throat swab specimens were collected on 4 May 2014 and tested positive for MERS-CoV on 5 May 2014. The patient died on 5 May 2014. He did not have a recent travel history or exposure to a known laboratory-confirmed case of MERS-CoV.

Globally, from September 2012 to date, WHO has been informed of a total of 496 laboratory-confirmed cases of infection with MERS-CoV. This total includes 229 cases reported between 11 April and 4 May by Saudi Arabia, and the recent reports of 3 cases from Jordan, and one case each from Egypt, the United States, and Yemen.

The full report is available online at http://www.who.int/csr/don/2014_05_07_mers_jordan/en/.

International, MERS-CoV (WHO [edited], May 7): On 15 April 2014, the IHR National Focal Point of Yemen notified WHO of a laboratory confirmed case of MERS-CoV in a 44 year-old male residing in Shibam. The patient was diagnosed as having hepatitis B and is reported to have developed symptoms on 17 March 2014, including fever, productive cough, chills, headache, muscle aches, and shortness of breath. He was admitted to hospital on 22 March 2014 in Hadramoot Governorate, and subsequently transferred on 29 March 2014 to an intensive-care unit of a private hospital in Sanaa. He was intubated, developed renal failure, and died on 31 March 2014.

Prior to the patient's decline and subsequent death, on 31 March 2014 oropharyngeal specimens were collected from the patient and tested positive on 2 April 2014. On 24 April 2014, the specimens were sent to the United States' Naval Medical Research Unit-3 (NAMRU-3) for external confirmation and tested positive on 5 May 2014. Oropharyngeal specimens collected from 12 contacts of the patient tested negative at NAMRU-3.

The patient was an aircraft maintenance engineer with contact among passengers at the airport where he was working. He had no history of travel during the last month of his illness and no known contact with a confirmed case. He is reported to have visited a camel farm on a weekly basis and drank fresh raw camel milk.

The full report is available online at http://www.who.int/csr/don/2014_05_07_mers_yemen/en/.

International, Human (CNN [edited], May 7): A 49-year-old man from China is believed to be the world's first human infected with the H5N6 avian flu strain.

The man, who was from Nanbu county in Sichuan province, died Tuesday in a hospital after receiving treatment, according to the Sichuan Provincial Health and Family Planning Commission. He suffered a severe case of pneumonia and was detected to have the H5N6 strain after a throat swab, according to the agency. The man had been exposed to dead poultry.

Medical experts say this an isolated case and that the risk of human-to-human transmission remains low. People who had close contact with the patient did not show any symptoms after medical observation, according to the commission.

Following this latest case, Taiwan issued a travel warning for Sichuan province, advising them to avoid contact with living or dead birds, according to Taiwan's Central News Agency.

The H5N6 is believed to be a low-pathogenic bird flu virus that has been found in Germany, Sweden and United States, according to the Taiwanese news service.

East Asia has seen several bird flu strains infecting humans recently.

The full article is available online at <http://edition.cnn.com/2014/05/07/health/h5n6-flu-china-death/>.

International, Poultry (OIE [edited], May 2): Highly pathogenic avian influenza H5N2; Chinese Taipei
Outbreak 1: Wanhua District, TAIPEI CITY; Date of start of the outbreak: 15/04/2014
Species: Birds; Cases: 2; Deaths: 2; Destroyed: 0; Affected population: Native chickens

International, Poultry (OIE [edited], May 5): Low pathogenic avian influenza H5N6; China
Outbreak 1: Nanbu, Nanbu, Nanchong, SICHUAN; Date of start of the outbreak: 23/04/2014
Epidemiological unit: Farm
Species: Birds; Cases: 1; Deaths: 0; Destroyed: 1338

International, Poultry (OIE [edited], May 7): Low pathogenic avian influenza H7N9; China
Outbreak 1: Live bird market, Boluo, Huizhou, GUANGDONG; Date of start of the outbreak: 22/04/2014
Affected population: 195 samples (all chickens) were collected according to the national surveillance plan and one sample was confirmed positive.

Outbreak 2: Live bird market, Litong District, Wuzhong, NINGXIA; Date of start of the outbreak: 25/04/2014
Affected population: 90 samples (80 chicken samples and 10 environment samples) were collected according to the national surveillance plan and one was confirmed positive by the National Reference Laboratory.

Outbreak 3: Gaoqi live bird market, Xiaomen, FUJIAN; Date of start of the outbreak: 25/04/2014
Affected population: 126 samples (40 chicken samples, 60 duck samples and 26 environment samples) were collected according to the national surveillance plan and one was confirmed positive by the National Reference Laboratory.

Outbreak 4: Haixia live bird market, Fuzhou, FUJIAN; Date of start of the outbreak: 25/04/2014
Affected population: 120 samples (including 50 chicken samples, 50 duck samples and 20 environment samples) were collected according to the national surveillance plan and 2 chicken samples were tested positive.

International, Wild Birds (Discovery News, May 6): A new version of bird flu unlike any other seen on Earth has been discovered in Antarctica, researchers announced today (May 6).

But breathe easy: The flu's gene segments show no sign that the virus is particularly deadly, nor is it adapted to transmit to mammals. An attempt to infect ferrets (an animal commonly used in flu studies) with the disease failed to get the ferrets sick.

The study does raise "a lot of unanswered questions," study researcher Aeron Hurt of the World Health Organization's center for flu research in Melbourne, Australia, said in a statement. Mysteries include how often avian flu viruses are introduced to the isolated continent of Antarctica and how they persist year after year.

Previous studies of penguins in Antarctica had found that multiple species of the bird sometimes carry flu antibodies in their blood. Antibodies are proteins created by the immune system in response to an infection.

But no one had ever found the virus itself. Hurt and his colleagues swabbed the tracheas and cloacas (waste and reproductive orifices) of 301 Adélie penguins from Admiralty Bay and Rada Covadonga on the Antarctica Peninsula. The researchers were also able to take blood samples from 270 of the birds.

In eight cases, the swabs turned up an influenza virus. The team was successfully able to culture four of the viruses in the lab, and found that all were strains of H11N2, a version of avian flu.

Intriguingly, these H11N2 strains did not look like strains seen elsewhere on Earth. Because avian flu is spread by migratory birds, strains tend to cluster in two groups defined by bird migrations: North American strains and Eurasian strains. Very little is known about avian flu in the Southern Hemisphere. Of 19,784 publicly available bird flu genetic sequences, only 5.7 percent come from Africa, 1 percent come from Australia and Oceania, and 0.1 percent come from South America.

Four of the gene segments analyzed in the new penguin flu look most similar to North American avian influenzas from the 1960s to the 1980s, while other segments look closer to South American strains, the researchers report today (May 6) in the journal mBio. One gene sequence looks most similar to H3N8, a virus known to infect horses, dogs and seals as well as birds.

Judging by the rate of evolutionary change in the virus, Hurt and his colleagues estimate that the virus has been evolving on its own in Antarctica for between 49 and 80 years.

Migratory birds that travel to and from Antarctica, such as skuas and giant petrels, may be responsible for carrying flu viruses to penguin populations, the researchers wrote in mBio. Marine mammals such as seals could spread the viruses, too. Another possibility, they wrote, is that avian flu circulates among penguins and other birds in the summer and becomes frozen in ice over the winter, only to reactivate during the summer thaw.

The article is online at <http://news.discovery.com/animals/new-penguin-flu-found-in-antarctica-140506.htm>.

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

MDCH Contributors

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Table. H5N1 Influenza in Humans – As of January 24, 2014. http://www.who.int/influenza/human_animal_interface/EN_GIP_20130124_CumulativeNumberH5N1cases.pdf. Downloaded 02/05/2014. Cumulative lab-confirmed cases reported to WHO. Total cases include deaths.

Country	2003-2010		2011		2012		2013		2014		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Azerbaijan	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	1	0	2	0	3	0	1	1	0	0	7	1
Cambodia	10	8	8	8	3	3	26	14	0	0	47	33
Canada	0	0	0	0	0	0	1	1	0	0	1	1
China	40	26	1	1	2	1	2	2	0	0	45	30
Djibouti	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	119	40	39	15	11	5	4	3	0	0	173	63
Indonesia	171	141	12	10	9	9	3	3	0	0	195	163
Iraq	3	2	0	0	0	0	0	0	0	0	3	2
Lao PDR	2	2	0	0	0	0	0	0	0	0	2	2
Myanmar	1	0	0	0	0	0	0	0	0	0	1	0
Nigeria	1	1	0	0	0	0	0	0	0	0	1	1
Pakistan	3	1	0	0	0	0	0	0	0	0	3	1
Thailand	25	17	0	0	0	0	0	0	0	0	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	12	4
Vietnam	119	59	0	0	4	2	2	1	1	1	126	63
Total	516	306	62	34	32	20	39	25	1	1	650	386