



MI Flu Focus

Influenza Surveillance Updates
Bureaus of Epidemiology and Laboratories



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Updates of Interest

- **Michigan:** MDCH reports 6th Michigan human case of variant H3N2 influenza virus
- **National:** The swine-origin H1N2 virus found in three Minnesotans last week carries the matrix gene from the 2009 H1N1 pandemic virus, marking the first time such a virus has been found in humans

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****H3N2v Influenza Update****

Since August 15, MDCH has reported 6 confirmed human cases of variant influenza A (H3N2) (H3N2v). Michigan cases have come from Clinton(1), Ingham(1), Shiawassee(2) and Washtenaw(2) counties. The first five cases have had mild illness and have had either direct or indirect swine exposure at county fairs in Michigan; an investigation is underway regarding the sixth case. Updated Michigan case counts of confirmed H3N2v infections will be posted every Friday on the MDCH Influenza Website: www.michigan.gov/flu. In addition, 296 human cases of H3N2v have been reported in association with swine exposure since July 2012 in 9 other states. The Michigan Department of Community Health issued updated guidance for healthcare providers, laboratories and local health departments on August 14 on the MDCH Influenza Website. Current information on this situation and updated case counts can be found on the CDC H3N2v website at www.cdc.gov/flu/swineflu/influenza-variant-viruses-h3n2v.htm. Please call the MDCH Division of Communicable Disease at (517) 335-8165 with any questions.

Influenza Surveillance Reports

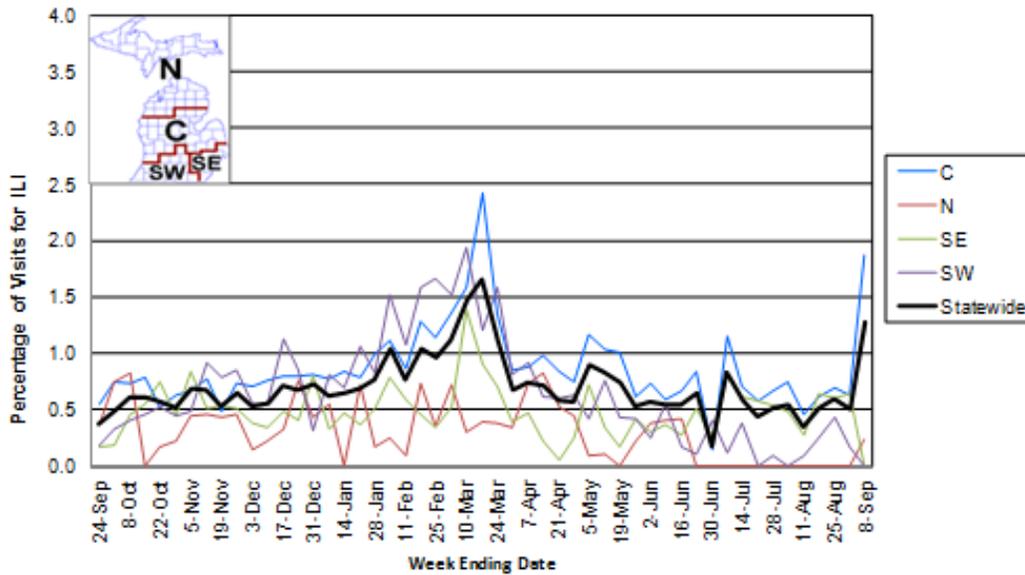
Michigan Disease Surveillance System (as of September 13): MDSS data for the week ending September 8th indicated that compared to levels from the previous week, aggregate reports increased, while individual reports remained steady at sporadic levels. The increase in aggregate reports corresponds to the start of the K-12 school year. Individual and aggregate reports are similar to levels seen during the same time period last year.

Emergency Department Surveillance (as of September 13): Compared to levels from the week prior, emergency department visits from both constitutional and respiratory complaints slightly increased. Both constitutional and respiratory complaints are similar to levels reported during the same time period last year. In the past week, there were 7 constitutional alerts in the SE(1), SW(2), C(2) and N(2) Influenza Surveillance Regions and 4 respiratory alerts in the SW(1), C(2) and N(1) Regions and 1 statewide alert.

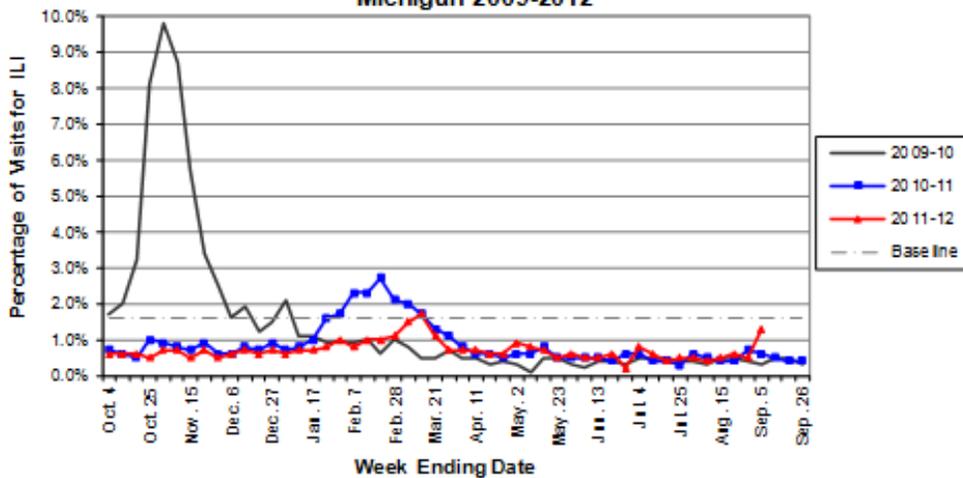
Sentinel Provider Surveillance (as of September 13): During the week ending September 8, 2012, the proportion of visits due to influenza-like illness (ILI) slightly increased to 1.3% overall; this is below the regional baseline of (1.6%). A total of 43 patient visits due to ILI were reported out of 3,375 office visits. Data were provided by twenty sentinel sites from the following regions: C (10), N (5), SE (4) and SW (1). ILI activity increased in two surveillance regions: Central (1.9%) and North (0.2%); the remaining regions reported no ILI activity: Southeast (0.0%) and Southwest (0.0%). Please Note: 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.

**Percentage of Visits for Influenza-like Illness (ILI)
Reported by Sentinel Providers, Statewide and Regions
2010-2011 and 2011-12 Flu Seasons**



**Percentage of Visits for Influenza-like Illness (ILI) Reported by the
US Outpatient Influenza-like Illness Surveillance Network (ILINet):
Michigan 2009-2012**



Hospital Surveillance (as of September 8): The Influenza Hospitalization Surveillance Project provides population-based rates of severe influenza illness in Clinton, Eaton and Ingham counties. For the 2011-12 season, 27 influenza hospitalizations (9 adult, 18 pediatric) were reported in the catchment area.

The MDCH Influenza Sentinel Hospital Network monitors influenza hospitalizations reported voluntarily by hospitals statewide. 3 hospitals (SE, SW) reported for the week ending September 8, 2012. Results are listed in the table below.

Age Group	Hospitalizations Reported During Current Week	Total Hospitalizations 2011-12 Season
0-4 years	0	21
5-17 years	0	23
18-49 years	0	32
50-64 years	0	28
≥65 years	0	43
Total	0	147

Laboratory Surveillance (as of September 8): During September 2-8, 1 positive influenza A(H1N1)pdm09 (SE) and 1 influenza B (C) results were reported by MDCH BOL. For the 2011-12 season (starting Oct. 2, 2011), MDCH has identified 1170 seasonal influenza results and 5 variant influenza H3N2 results:

- Influenza A(H3): 1056 (608SE, 98SW, 303C, 47N)
- Influenza A(H1N1)pdm09: 33 (23SE, 3SW, 5C, 2N)
- Influenza B: 80 (30SE, 32SW, 13C, 5N)
- Influenza A(H3) and B co-infection: 1 (SE)
- Influenza A(H3N2)variant: 5 (2SE, 1SW, 2C)
- Parainfluenza: 3 (2SE, 1C)
- Adenovirus: 3 (3SE)
- RSV: 4 (1SW, 1C, 2N)

8 sentinel labs (SE, SW, C, N) reported for the week ending September 8, 2012. One lab (C) reported sporadic influenza B activity. No labs reported influenza A, parainfluenza, adenovirus or HMPV activity. Testing volumes are at very low levels.

Michigan Influenza Antigenic Characterization (as of September 13): For the 2011-12 season, 69 Michigan influenza B viruses have been characterized at MDCH. 8 viruses are B/Brisbane/60/2008-like (included in the 2011-12 vaccine). 61 are B/Wisconsin/01/2010-like (not included in the 2011-12 vaccine).

Michigan Influenza Antiviral Resistance Data (as of September 13): For the 2011-12 season, 26 Michigan influenza A(H1N1)pdm09 specimens and 95 influenza A(H3) specimens have been tested for antiviral resistance at MDCH Bureau of Laboratories; all have tested negative for oseltamivir resistance. 11 Michigan influenza A(H3N2), 2 influenza A(H1N1)pdm09, and 4 influenza B specimens have been tested for antiviral resistance at the CDC; all have tested negative for oseltamivir and zanamivir resistance.

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 September 13): No pediatric influenza-associated influenza mortalities have been reported to MDCH for the 2011-12 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 September 13): No new respiratory outbreaks were reported to MDCH during the past week. 30 respiratory outbreaks (5SE, 3SW, 20C, 2N) have been reported to MDCH during the 2011-12 season; testing results are listed below.

- Influenza A/H3: 15 (4SE, 1SW, 10C)
- Influenza A: 2 (2C)
- Human metapneumovirus: 1 (SW)
- Negative or not tested: 12 (1SE, 1SW, 8C, 2N)

National (CDC): Past weekly reports and updated data during the summer months are available online at <http://www.cdc.gov/flu/weekly/fluactivity.htm>.

International (WHO [edited], August 31): Most countries in the northern temperate zone have stopped weekly reporting or moved over to out of season surveillance schedules. The United States of America has discovered new cases of swine origin influenza A(H3N2)v in humans; no sustained human-to-human transmission has been identified so far. In the tropical zone, the countries reporting notable influenza activity are Brazil, Costa Rica, Cuba, Ecuador, El Salvador, Honduras, Nicaragua Panama, Peru, and Bolivia in the Americas (A(H1N1)pdm09, A(H3N2) and type B); Ghana and Madagascar in sub-Saharan Africa (A(H3N2) and type B); Bhutan, Cambodia, southern China, Hong Kong, India, Lao People's Democratic Republic, Singapore, Sri Lanka and Viet Nam in Asia (A(H3N2) and type B). Influenza activity decreased in temperate countries of the southern hemisphere. Australia, Chile, New Zealand, Paraguay and South Africa, continue to report declines in most transmission indicators. Argentina continues to report very low numbers of detections compared to previous seasons. Influenza A(H3N2) viruses are the most commonly reported type/sub-type in recent weeks in most countries of the southern hemisphere temperate region including Chile, South Africa, and Australia. However, in Central America the previously reported transmission of A(H1N1)pdm09 has now largely transition to a predominance of influenza B. In tropical Asia, southern China and Southeast Asia have been reporting mostly A(H3N2), whereas Bhutan, India and Sri Lanka have had both A(H1N1) and B circulating. Reports of neuraminidase resistance continue to be very uncommon. Notably, Australia reports that a large proportion of the A(H3N2) viruses tested so far this season demonstrated reduced titers in haemagglutination inhibition assays using ferret antisera against the vaccine viruses contained in the current southern hemisphere vaccines.

Weekly reporting to the CDC has ended for the 2011-2012 influenza season.

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.

National, Human (CIDRAP, September 7): The swine-origin H1N2 virus found in three Minnesotans last week carries the matrix gene from the 2009 H1N1 pandemic virus, marking the first time such a virus has been found in humans, according to state and federal health officials.

The variant H1N2, or H1N2v, virus is different from the swine-origin H3N2v strain that has cropped up in nearly 300 people within the past year. But the two are alike in that both picked up the pandemic virus's matrix gene.

The number of H3N2v cases has risen to 297, an increase of 7 since a week ago, according to the Centers for Disease Control and Prevention's (CDC's) new count, posted today. Nearly all the cases have been in people who were exposed to pigs, most of them at agricultural fairs this summer. Only one death, that of an Ohio woman who had other medical conditions, has been linked to the virus, but there have been 16 hospitalizations.

No ongoing human-to-human transmission of either H3N2v or H1N2v viruses has been reported, but the CDC has said that the H1N1 matrix gene might increase the transmissibility of H3N2v and that a few instances of likely human-to-human spread of that virus have been found.

In reporting the H1N2v cases in a statement today, the CDC said the population probably has some immunity to it because of past exposure to seasonal H1N1 flu viruses.

"Genetic analysis shows that the hemagglutinin (H) of this virus is similar to human seasonal influenza viruses that circulated in people as recently as 2009, so there would likely be protective immunity against this particular virus in the human population," the agency said.

The three confirmed H1N2v cases reported in Minnesota last week were all in people who were exposed to pigs at the State Fair. The Minnesota Department of Health (MDH) said today that a fourth case has since been reported and is awaiting confirmation by the CDC.

MDH spokesman Buddy Ferguson said the "presumptive positive" case involved a teenage boy from outside the Twin Cities area who exhibited pigs at the State Fair from Aug 23 to 26 and got sick on Aug 28. Ferguson said he didn't know of any connection between the teenager and the other three cases.

The teenager was not hospitalized, Ferguson said, but he had no other information on his illness or recovery.

Although H1N2v is new in humans, the US Department of Agriculture's swine flu surveillance program has detected very similar H1N2 viruses with the 2009 H1N1 matrix gene in pigs in Minnesota and some other states since early 2010, the CDC reported.

In reporting the cases last week, the MDH said two sick pigs at the State Fair tested positive for H1N2. Ferguson reported that the virus in the pigs was also found to contain the 2009 H1N1 matrix gene.

The H1N2v cases demonstrate once again that swine flu viruses can spread to people, and they point up the importance of the CDC recommendation that people at risk for serious flu complications should avoid close contact with pigs and pig barns at fairs this season, the agency said.

Those at risk include children under age 5, people over 65, pregnant women, and people who have long-term health problems such as asthma, other lung diseases, diabetes, heart disease, weakened immunity, and neurologic or neurodevelopmental conditions.

Although the recent H1N2v cases are the first known to contain the 2009 H1N1 matrix gene, a few other H1N2v cases have been reported in recent years. One case was reported in a Minnesota child in December 2011. Another case was reported in 2007 in an 18-month-old Michigan child who had been in a swine barn. Both of those patients recovered.

In 2002 the CDC reported that a total of 11 human H1N2 cases had been detected in Wisconsin, Texas, and Nevada the previous year.

In other developments, one sick pig at the Minnesota State Fair was found infected with an H3N2 virus, according to Tom Hagerty, DVM, the State Fair veterinarian. The case turned up on the last day of the fair, Sep 3, and was the only swine H3N2 case found during the event, he told CIDRAP News.

Three human H3N2v cases have been reported in Minnesota, all of them in people who had visited a live animal market, according to the MDH.

The leading states for H3N2v cases are Indiana, with 138, and Ohio, with 102, according to CDC data.

View the article at <http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/sep0712h1n2.html>.

International, Human (MMWR abstract, September 14): Notes from the Field: Highly Pathogenic Avian Influenza A (H7N3) Virus Infection in Two Poultry Workers - Jalisco, Mexico, July 2012. Morbidity and Mortality Weekly Report. September 14, 2012 / 61(36);726-727.

During June–August 2012, Mexico's National Service for Health, Safety, and Food Quality reported outbreaks of highly pathogenic avian influenza (HPAI) A (H7N3) virus in poultry on farms throughout the state of Jalisco. This report describes two cases of conjunctivitis without fever or respiratory symptoms caused by HPAI A (H7N3) virus infection in humans associated with exposure to infected poultry.

View the article at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6136a4.htm?s_cid=mm6136a4_e.

National, Poultry and Wild Birds (CIDRAP, September 10): Avian flu isolates collected from live-bird markets in the United States showed independent evolution toward resistance in the absence of antiviral drugs, according to a study in *Influenza and Other Respiratory Viruses*. US researchers conducted a phylogenetic analysis of the M gene of 229 avian flu viruses from wild birds and live-bird markets to identify changes that may be associated with resistance to adamantanes, an older class of antiviral drugs. They found 27 different subtypes among the isolates, with H3N8 being the most dominant in wild birds and H7N2 in market birds. None of the isolates from wild birds showed resistance-associated mutations, but 17 collected at live-bird markets did. None of the birds had been exposed to antiviral drugs, which the authors say showcases the need for continued active surveillance.

The abstract is available online at <http://onlinelibrary.wiley.com/doi/10.1111/irv.12003/abstract>.

Michigan Wild Bird Surveillance (USDA, as of September 13): For the 2012 season (April 1, 2012–March 31, 2013), highly pathogenic avian influenza H5N1 has not been recovered from the 7 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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MDCH Bureau of Laboratories – A. Muyombwe, PhD; V. Vavricka, MS

Table. H5N1 Influenza in Humans – As of August 10, 2012. http://www.who.int/influenza/human_animal_interface/EN_GIP_20120810CumulativeNumberH5N1cases.pdf. Downloaded 8/13/2012. Cumulative lab-confirmed cases reported to WHO. Total cases include deaths.

Country	2003-2005		2006		2007		2008		2009		2010		2011		2012		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Azerbaijan	0	0	8	5	0	0	0	0	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	0	6	0
Cambodia	4	4	2	2	1	1	1	0	1	0	1	1	8	8	3	3	21	19
China	9	6	13	8	5	3	4	4	7	4	2	1	1	1	2	1	43	28
Djibouti	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	18	10	25	9	8	4	39	4	29	13	39	15	10	5	168	60
Indonesia	20	13	55	45	42	37	24	20	21	19	9	7	12	10	8	8	191	159
Iraq	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Lao PDR	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	3	1
Thailand	22	14	3	3	0	0	0	0	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	12	4	0	0	0	0	0	0	0	0	0	0	0	0	12	4
Vietnam	93	42	0	0	8	5	6	5	5	5	7	2	0	0	4	2	123	61
Total	148	79	115	79	88	59	44	33	73	32	48	24	62	34	30	19	608	359