HAWAII STATE DEPARTMENT OF HEALTH
DISEASE OUTBREAK CONTROL DIVISION

Influenza Surveillance Report

Morbidity and Mortality Weekly Report (MMWR)[1]

WEEK 8: FEBRUARY 18, 2018–FEBRUARY 24, 2018

OVERVIEW: The Hawaii State Department of Health (HDOH) monitors influenza and other respiratory pathogens throughout the state of Hawaii. Influenza surveillance in the state of Hawaii relies upon selected sentinel health practitioners, the State Laboratories Division (SLD), private laboratories, and the Office of Health Status Monitoring (OHSM). For detailed information concerning influenza, please visit the HDOH Disease Outbreak Control Division (HDOH DOCD) website (*here*). **All data and information are conditional and may change as more reports are received.**

The data in this report reflects the 2017–18 influenza season which began the week ending October 7, 2017 (week 40[1] 2017) and will end the week ending on September 29, 2018 (week 39 2018).

REPORT SNAPSHOT FOR WEEK 8

Surveillance for Influenza-like Illness (ILI)		
Metric	*Value*	*Comment*
Outpatient visits related to influenza-like illness (ILI) from ILINet Sentinel Providers	4.9%	Lower than the previous week. Comparable to Hawaii's historical baseline, comparable to the national ILI rate, and higher than the national baseline.
Number of ILI clusters reported to HDOH	0	There has been a total of 35 clusters this season.

Laboratory Surveillance		
Percent of all respiratory specimens positive for influenza this week	19.4%	Lower than the previous week. This number means that many, if not all, of the 80.6% who tested negative for influenza had illness from another respiratory etiology.
Percent of all respiratory specimens positive for influenza this season to date	28.6%	

Surveillance for Severe Outcomes		
Pneumonia and influenza (P&I) mortality rate	5.2%	Comparable to Hawaii's historical baseline. Due to data processing problems, NCHS mortality surveillance data for this week will be delayed.
Number of influenza-associated pediatric deaths reported nationwide	17	

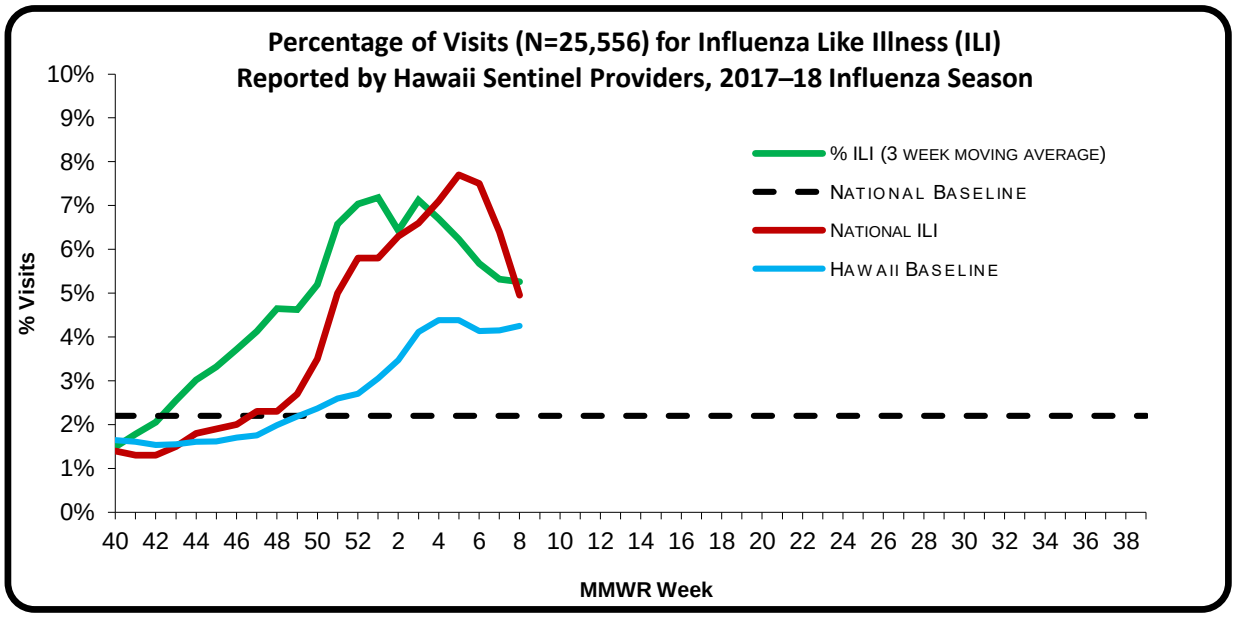
[1] MMWR stands for "Morbidity and Mortality Weekly Report," conventionally used by the Centers for Disease Control and Prevention (CDC). The weeks of a flu season are often referred to by their respective MMWR week. **See appendix 2 for interpretation of MMWR weeks.** Data reported will begin on week 40, the traditional start date of flu season.

INFLUENZA SURVEILLANCE

I. INFLUENZA-LIKE ILLNESS (ILI): HDOH collaborates with recruited doctors and healthcare providers who report the total number of outpatient visits for ILI as well as the total number of patients who complained of symptoms consistent with an ILI. A patient with ILI must have the following: a fever (temperature of 100°F [37.8°C] or greater) AND a cough and/or a sore throat without a known cause other than influenza. ILI is based on reported symptoms and not laboratory confirmed tests; thus, ILI may represent other respiratory pathogens and not solely influenza. Further, sentinel providers report these numbers on a weekly basis; therefore, data are preliminary and may change depending on additional reporting. In combination with laboratory testing and other surveillance systems, ILI surveillance helps monitor influenza and other respiratory pathogen activity. For more information concerning ILINet and sentinel requirements, please visit the CDC website (*here*).

For **week 8** of the current influenza season:

- ***4.9**% (season to date: **4.4**%) of the outpatient visits recorded by Hawaii sentinel providers were for ILI.*
- *ILI visits were comparable to the historical baseline in Hawaii[2,3] (i.e., inside the 95% confidence interval).*
- *Hawaii's ILI outpatient visits were higher than the national baseline (2.2%)[4] (i.e., outside the 95% confidence interval) and comparable to the national ILI rate (**4.9%**) (i.e., inside the 95% confidence interval).*
- *Geographic Spread: Local Activity[5]*
- *ILI Cluster Activity: No new clusters were reported to HDOH during week 8.*



[2] The Hawaii historical baseline (%ILI) is the average of 3-week moving averages over the preceding five flu seasons of historical data (2012–2013, 2013–2014, 2014-2015, 2015-2016, and 2016-2017).
[3] This value is based upon comparison of actual outpatient ILI with the historical baseline, which only captures outpatient ILI. The chart above represents a 3-week moving average and not the actual ILI by week.
[4] The National Baseline is calculated by CDC as the mean percentage of visits for ILI during weeks 21–39 with two standard deviations. Because of large variability in regional ILI, comparison of the national baseline with local ILI may not be appropriate. It is provided in this report because no meaningful regional baselines are available for comparison. The national baseline combines all data reported by states to CDC, including ILI in outpatient, ER, urgent care, and inpatient settings.
[5] The influenza activity reported by state and territorial epidemiologists indicates geographic spread of influenza viruses, but does not measure the severity of influenza activity. Sporadic: no clusters reported to HDOH, Local: one or more clusters reported on one island, Regional: clusters reported on more than one island, Widespread: clusters reported on all islands. Hawaii does not report No Activity, as flu circulates year round in Hawaii.

II. LABORATORY SURVEILLANCE: State Laboratories Division (SLD; the HDOH public health laboratory) and Hawaii's major private laboratories (DLS, CLH) report results of RT-PCR, which can be considered confirmatory (SLD may perform viral culture on select specimens). Specimens meeting priority criteria[6] are forwarded to SLD for sub-typing. Additionally, specimens meeting case definition from requesting sentinel providers are sent directly to SLD for sub-typing. Due to resource constraints, not all submitted specimens undergo sub-typing. Sub-typing at the commercial laboratories is only conducted on a case-by-case basis. The majority of specimens testing positive by rapid antigen testing or RT-PCR at the commercial laboratories do not meet criteria and are not subtyped. For more information on influenza tests and types, please visit the CDC website (*here*).

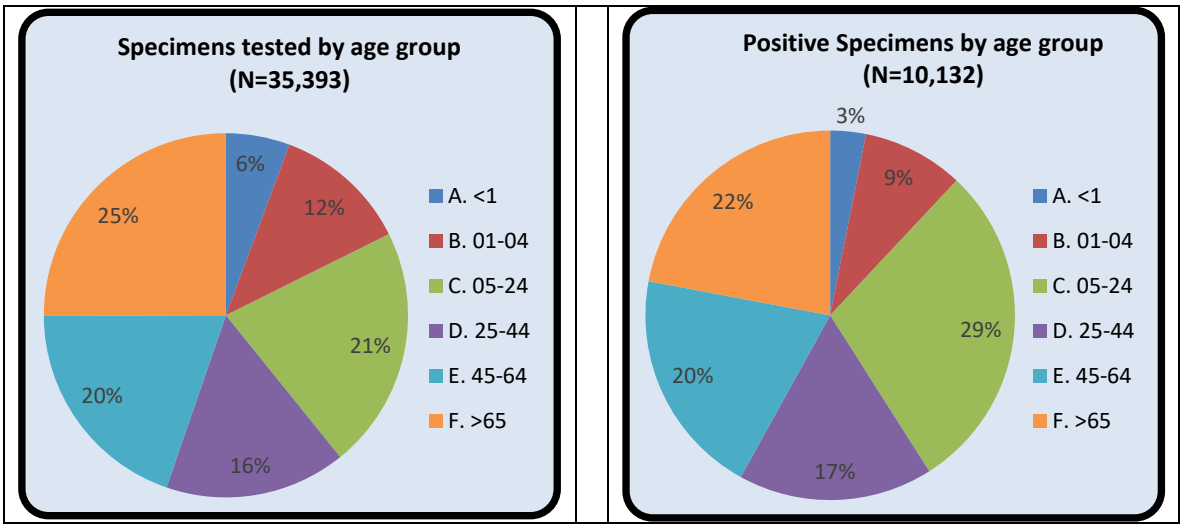
A. INFLUENZA:

- The following reflects laboratory findings for week 8 of the 2017–18 influenza season:
  - *A total of **1,725** specimens have been tested statewide for influenza viruses (positive: **334** [**19.4%**]). (Season to date: **35,393** tested [**28.6%** positive])*
    - *1,083 (62.8%) were screened only by rapid antigen tests with no confirmatory testing*
    - *642 (37.2%) underwent confirmatory testing (either RT-PCR or viral culture)*
    - *1,391 (80.6%) were negative.*

Influenza type	*Current week 8 (%)*	*Season to date (%)*
Influenza A (H1)[7]	*3 (0.9)*	*23 (0.2)*
Influenza A (H3)	*15 (4.5)*	*408 (4.0)*
Influenza A no subtyping	*138 (41.3)*	*7,484 (73.9)*
Influenza B (Yamagata)	*5 (1.5)*	*122 (1.2)*
Influenza B (Victoria)	*2 (0.6)*	*13 (0.1)*
Influenza B no genotyping	*171 (51.2)*	*2,082 (20.6)*

1. AGE DISTRIBUTION

The pie charts below indicate the distribution of specimens tested and positive influenza cases in Hawaii by age group during the 2017–18 influenza season.

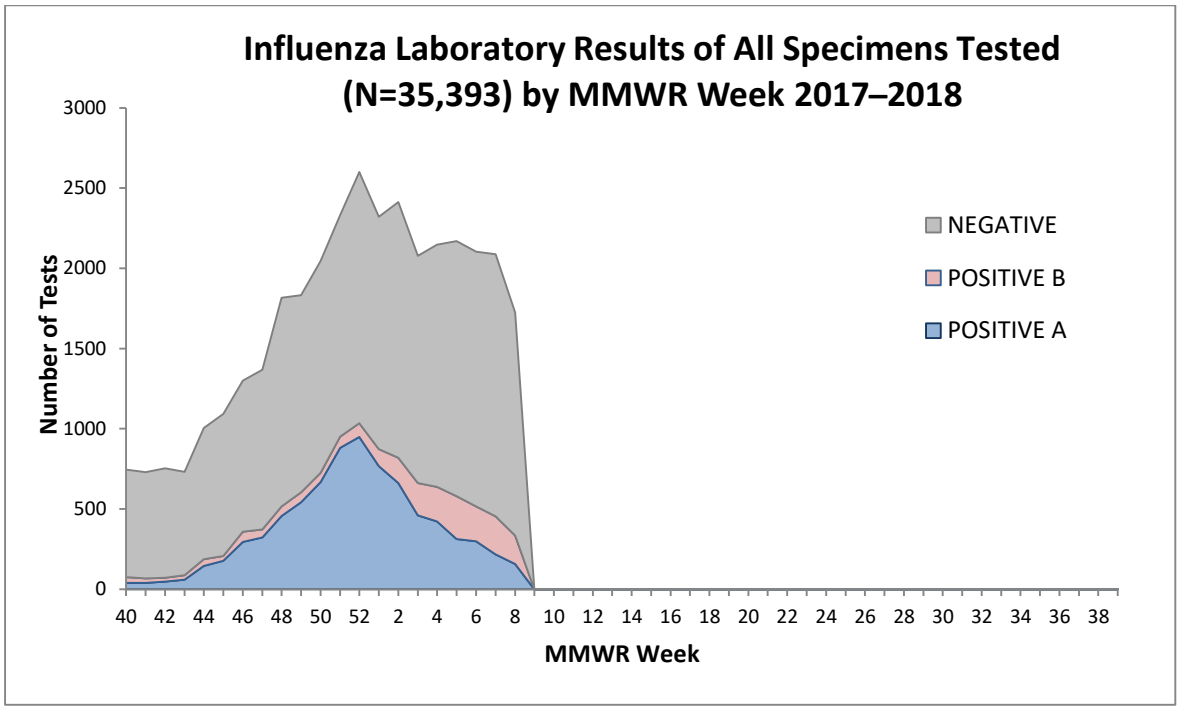


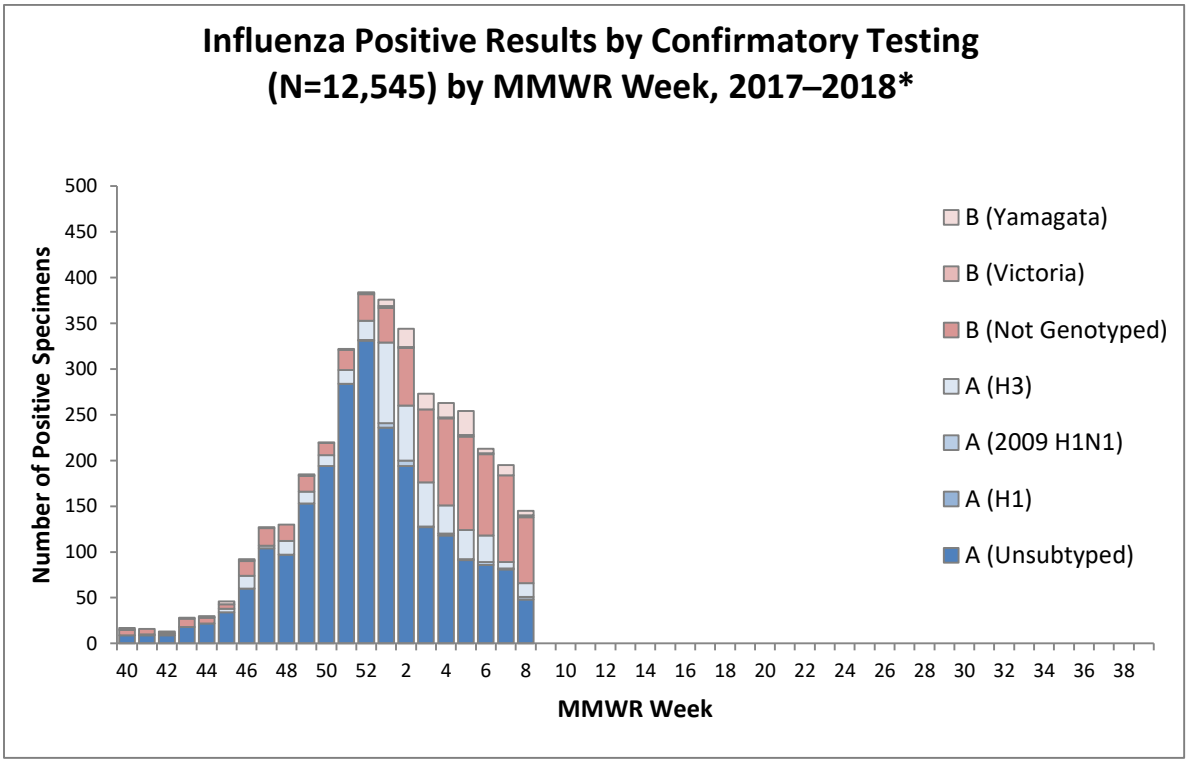
[6] Priority criteria include: hospitalized patients with acute respiratory distress syndrome [ARDS] or x-ray confirmed pneumonia; travelers with international travel history within 10 days of onset; specimens submitted by sentinel providers; specimens collected from healthcare workers, pregnant women, or women up to 6 weeks' post-partum; those with underlying medical conditions; and patients presenting with unusual or severe manifestations of influenza infection.

[7] All influenza A H1 viruses detected this season have been 2009 H1N1. Other H1 viruses have not been detected since 2010.

2. LABORATORY TESTING

The charts below show the laboratory results of all specimens tested for influenza by MMWR week during the 2017–2018 influenza season as well as the type and subtype of positive results for influenza. Again, sub-typing is only performed on selected specimens tested by confirmatory tests (i.e., RT-PCR or viral culture).





** Not all positive influenza specimens receive confirmatory testing, and results may not necessarily represent the proportion of types/subtypes that are circulating in Hawaii.*

B. OTHER RESPIRATORY PATHOGENS: The major clinical and commercial laboratories throughout the state of Hawaii have the testing capacity for non-influenza respiratory pathogens and report these to HDOH. However, such testing is performed as needed and when sufficient resources are available because of the high costs associated with respiratory panel tests. **Therefore, available data represent only the presence of circulating pathogens and cannot be used to determine specific trends**.

ALL RESPIRATORY ISOLATES IDENTIFIED DURING THE 2017–2018 FLU SEASON

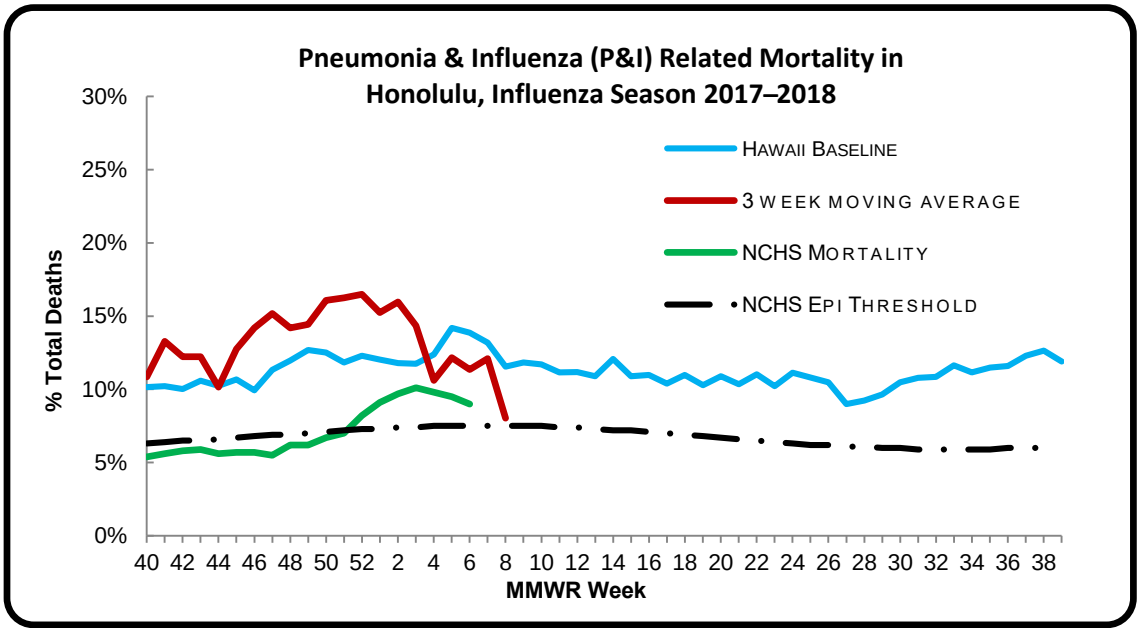
	MMWR Week (2017-2018)																																																		
Isolates	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Adenovirus	X	X	X				X	X	X	X	X			X	X	X	X	X																																		
Coronavirus	X	X									X	X	X	X	X			X		X																																
Coxsackie Virus																																																				
Cytomegalovirus																																																				
Echovirus																																																				
Enterovirus																																																				
Herpes Simplex Virus, Type 1																																																				
Metapneumovirus	X	X	X			X		X	X				X	X			X	X	X	X																																
Parainfluenza Virus			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																															
Respiratory Syncytial Virus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																															
Rhinovirus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																																
Varicella Zoster Virus																																																				
Influenza 2009 H1N1	X														X		X				X																															
Influenza A (H3)							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																															
Influenza A (Other seasonal H1)																																																				
Influenza A (unsubtyped)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																															
Influenza B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																															

III. PNEUMONIA AND INFLUENZA (P&I) RELATED MORTALITY:

P&I mortality surveillance is collected by CDC through the National Center for Health Statistics (NCHS) using death certificate data. Each week the HDOH OHSM reports specific data from Honolulu to the CDC. CDC collects the following information by age group: the total number of deaths, total deaths from pneumonia, and total deaths related to influenza. Studies have suggested that P&I is a good indicator of influenza-related deaths and therefore P&I is one method for influenza surveillance.

For **week 8** of the current influenza season:

- ***5.2%*** *of all deaths that occurred in Honolulu during week 8 were related to pneumonia or influenza. For the current season (season to date:* ***13.8%****), there have been 1,761 deaths from any cause, 237 of which were due to P&I.*
- *The P&I rate was comparable to the historical baseline in Hawaii[8] (i.e., inside the 95% confidence interval).*
- *National P&I data are backlogged by two weeks and current data for weeks 7–8 are unavailable at this time. Based on NCHS mortality surveillance data available for week 5[9] (week ending February 10, 2018), 9.0% of deaths that occurred nationally were due to P&I. This percentage is above the national epidemic threshold of 7.4% for week 6.*



INFLUENZA-ASSOCIATED PEDIATRIC DEATHS[10]:

- No influenza-associated pediatric deaths have been reported in Hawaii during the 2017–2018 season.
- Nationally, 17 influenza-associated pediatric deaths were reported to CDC during week 8. Three deaths were associated with an influenza A(H3) virus and occurred during weeks 7 and 8 (the weeks ending February 17 and February 24, 2018, respectively). One death was associated with an influenza A(H1N1)pdm09 virus and occurred during week 7 (the week ending February 17, 2018). Four deaths were associated with an influenza A

[8] The Hawaii historical baseline (%P&I) is the average of 3-week moving averages over the preceding five flu seasons of historical data (2012–2013, 2013–2014, 2014-2015, 2015-2016, and 2016-2017).

[9] There is a backlog of data requiring manual coding within NCHS mortality surveillance data. Efforts continue to reduce and monitor the number of records awaiting manual coding.

[10] Influenza-associated deaths are considered pediatric in persons aged less than 18 years. It was made a nationally notifiable condition in October, 2004. All pediatric influenza-associated deaths are laboratory confirmed.

virus for which no subtyping was performed and occurred during weeks 52, 7 and 8 (the weeks ending December 30, 2017, February 17, and February 24, 2018, respectively). Nine deaths were associated with an influenza B virus and occurred during weeks 6, 7 and 8 (the weeks ending February 10, February 17, and February 24, 2018, respectively). (Season total: 114).

IV. INFLUENZA WATCH: As part of a comprehensive influenza surveillance system and to prevent the spread of contagious respiratory diseases in humans, it is important to monitor all circulating influenza types. Several animal-origin influenza A subtypes are currently of interest: influenza A variant virus (H3N2v, H1N2v, and H1N1v) and Avian flu (H5N1 and H7N9). These types of influenza viruses may cause zoonotic (animal-associated) disease and are a public health concern.

A. VARIANT VIRUSES:

Influenza viruses that normally circulate in pigs are called "variant" viruses when they are found in people. These viruses were first identified in U.S. pigs in 2010. In 2011, 12 cases of H3N2v infection were detected in the United States. In 2012, 309 such cases (resulting in 16 hospitalizations and one death) across 12 states were detected, including one Hawaii case who recovered. Illness associated with H3N2v infection has been mostly mild with symptoms similar to those of seasonal flu. However, serious illness, resulting in hospitalization and death, has occurred in some cases. Most of these infections have been associated with prolonged exposure to pigs at agricultural fairs or similar settings. Limited human-to-human spread of this virus has been detected in the past, but no sustained community spread of H3N2v has been identified. More information regarding H3N2v, H1N1v, and H1N2v viruses may be found on the CDC website (*here*) and (*here*).

- *No variant or novel influenza infections have been reported to HDOH during the 2017–2018 influenza season.*
- *A total of six human infections with novel influenza A viruses, H1N1v, H3N2v, and H1N2v, have been reported to CDC during the 2017–2018 influenza season.*
    - *No new human infections with novel influenza A viruses were reported to CDC during week 8.*

B. AVIAN (OR BIRD) INFLUENZA:

These types of influenza viruses cause zoonotic (animal-associated) disease of public health concern and are therefore monitored globally by the WHO. Most avian influenza viruses do not cause disease in humans and are generally not easily transmissible between person to person, but a few subtypes may cross the species barrier and cause disease in humans. Avian influenza viruses may be of various subtypes, including H5N1, H5N2, H5N8, H7N3, H7N7, H7N8, H7N9, and H9N2. On January 15th, 2016, the USDA and APHIS reported detection of HPAI H7N8 in a commercial turkey flock in Indiana. There have been no associated human infections. This is the first detection of HPAI H7N8 in wild bird surveillance in the United States. More information, the risk assessment and recommendations for HPAI H7N8 can be found (*here*). The WHO, CDC, and other public health agencies have also been monitoring influenza H7N9, which represents a public health concern because of its high pandemic potential. Although H7N9 has not been detected in the United States, it remains a global concern given continuing epidemics in endemic countries. Since 2013, a total of 1,566 laboratory-confirmed cases of human infection with H7N9 viruses, including at least 613 deaths, have been reported to WHO. More information on H7N9 virus infections can be found (*here*). For more information regarding avian influenza, please visit the CDC (*here*) or the WHO (*here*) websites. WHO reports total number of cases and deaths related to laboratory-confirmed avian influenza viruses and posts current avian influenza case counts (*here*), which were last updated on **January 25, 2018**.

V. INFLUENZA VACCINE: Annual influenza vaccination is recommended for all persons aged 6 months and older and is the most effective way to reduce the risk of getting sick with seasonal flu and spreading it to others. Influenza vaccination can reduce illnesses, visits to the doctor, influenza-related hospitalizations, and missed work and school days. Influenza vaccines become available by the end of October. It takes at least two weeks after vaccination to confer immunity against influenza virus infection. More information regarding influenza vaccination can be found (*here*).

A. COMPOSITION OF THE 2017–2018 INFLUENZA VACCINE:

The composition of the 2017–2018 influenza vaccine has been updated to better match circulating influenza viruses. The Food and Drug Administration's Vaccines and Related Biologic Products Advisory Committee (VRBPAC) has recommended that the 2017–2018 influenza trivalent vaccine contain an A/Michigan/45/2015 (H1N1)pdm09-like virus, an A/Hong Kong/4801/2014 (H3N2)-like virus, and a B/Brisbane/60/2008-like (B/Victoria lineage) virus. Quadrivalent vaccines, which contain two influenza A and two influenza B viruses, are recommended to contain a B/Phuket/3073/2013-like (B/Yamagata lineage) virus in addition to the same viruses recommended for the trivalent vaccines. These vaccine recommendations were based on a number of factors, including global influenza virologic and epidemiologic surveillance, genetic and antigenic characterization, human serology studies, antiviral susceptibility, and the availability of candidate influenza viruses.

APPENDIX 1: ADDITIONAL INFORMATION

For more information regarding local and national influenza surveillance programs, visit the following sites.

Centers for Disease Control and Prevention	General Influenza National ILI and P&I Data Vaccine Virus Selection
Flu.gov	General Influenza Information
HDOH Flu and Pneumonia	General Influenza Surveillance To find out more information or join the sentinel physician program, email the Influenza Surveillance Coordinator
World Health Organization	General Global and Local Influenza Avian Influenza

APPENDIX 2: MMWR WEEK DATES

Please refer to the table below to interpret data presented by MMWR week. Week 40 is considered the traditional start for the flu season for the Northern Hemisphere.

MMWR WEEK	2014	2015	2016	2017	2018
1	1/4/2014	1/10/2015	1/9/2016	1/7/2017	1/6/2018
2	1/11/2014	1/17/2015	1/16/2016	1/14/2017	1/13/2018
3	1/18/2014	1/24/2015	1/23/2016	1/21/2017	1/20/2018
4	1/25/2014	1/31/2015	1/30/2016	1/28/2017	1/27/2018
5	2/1/2014	2/7/2015	2/6/2016	2/4/2017	2/3/2018
6	2/8/2014	2/14/2015	2/13/2016	2/11/2017	2/10/2018
7	2/15/2014	2/21/2015	2/20/2016	2/18/2017	2/17/2018
8	2/22/2014	2/28/2015	2/27/2016	2/25/2017	2/24/2018
9	3/1/2014	3/7/2015	3/5/2016	3/4/2017	3/3/2018
10	3/8/2014	3/14/2015	3/12/2016	3/11/2017	3/10/2018
11	3/15/2014	3/21/2015	3/19/2016	3/18/2017	3/17/2018
12	3/22/2014	3/28/2015	3/26/2016	3/25/2017	3/24/2018
13	3/29/2014	4/4/2015	4/2/2016	4/1/2017	3/31/2018
14	4/5/2014	4/11/2015	4/9/2016	4/8/2017	4/7/2018
15	4/12/2014	4/18/2015	4/16/2016	4/15/2017	4/14/2018
16	4/19/2014	4/25/2015	4/23/2016	4/22/2017	4/21/2018
17	4/26/2014	5/2/2015	4/30/2016	4/29/2017	4/28/2018
18	5/3/2014	5/9/2015	5/7/2016	5/6/2017	5/5/2018
19	5/10/2014	5/16/2015	5/14/2016	5/13/2017	5/12/2018
20	5/17/2014	5/23/2015	5/21/2016	5/20/2017	5/19/2018
21	5/24/2014	5/30/2015	5/28/2016	5/27/2017	5/26/2018
22	5/31/2014	6/6/2015	6/4/2016	6/3/2017	6/2/2018
23	6/7/2014	6/13/2015	6/11/2016	6/10/2017	6/9/2018
24	6/14/2014	6/20/2015	6/18/2016	6/17/2017	6/16/2018
25	6/21/2014	6/27/2015	6/25/2016	6/24/2017	6/23/2018
26	6/28/2014	7/4/2015	7/2/2016	7/1/2017	6/30/2018
27	7/5/2014	7/11/2015	7/9/2016	7/8/2017	7/7/2018
28	7/12/2014	7/18/2015	7/16/2016	7/15/2017	7/14/2018
29	7/19/2014	7/25/2015	7/23/2016	7/22/2017	7/21/2018
30	7/26/2014	8/1/2015	7/30/2016	7/29/2017	7/28/2018
31	8/2/2014	8/8/2015	8/6/2016	8/5/2017	8/4/2018
32	8/9/2014	8/15/2015	8/13/2016	8/12/2017	8/11/2018
33	8/16/2014	8/22/2015	8/20/2016	8/19/2017	8/18/2018
34	8/23/2014	8/29/2015	8/27/2016	8/26/2017	8/25/2018
35	8/30/2014	9/5/2015	9/3/2016	9/2/2017	9/1/2018
36	9/6/2014	9/12/2015	9/10/2016	9/9/2017	9/8/2018
37	9/13/2014	9/19/2015	9/17/2016	9/16/2017	9/15/2018
38	9/20/2014	9/26/2015	9/24/2016	9/23/2017	9/22/2018
39	9/27/2014	10/3/2015	10/1/2016	9/30/2017	9/29/2018
40	10/4/2014	10/10/2015	10/8/2016	10/7/2017	10/6/2018
41	10/11/2014	10/17/2015	10/15/2016	10/14/2017	10/13/2018
42	10/18/2014	10/24/2015	10/22/2016	10/21/2017	10/20/2018
43	10/25/2014	10/31/2015	10/29/2016	10/28/2017	10/27/2018
44	11/1/2014	11/7/2015	11/5/2016	11/4/2017	11/3/2018
45	11/8/2014	11/14/2015	11/12/2016	11/11/2017	11/10/2018
46	11/15/2014	11/21/2015	11/19/2016	11/18/2017	11/17/2018
47	11/22/2014	11/28/2015	11/26/2016	11/25/2017	11/24/2018
48	11/29/2014	12/5/2015	12/3/2016	12/2/2017	12/1/2018
49	12/6/2014	12/12/2015	12/10/2016	12/9/2017	12/8/2018
50	12/13/2014	12/19/2015	12/17/2016	12/16/2017	12/15/2018
51	12/20/2014	12/26/2015	12/24/2016	12/23/2017	12/22/2018
52	12/27/2014	1/2/2016	12/31/2016	12/30/2017	12/29/2018
53					