

HAWAII STATE DEPARTMENT OF HEALTH

DISEASE OUTBREAK CONTROL DIVISION

2014-2015 INFLUENZA SEASON SUMMARY

September 29, 2014 – October 3, 2015: MMWR¹ Week 40, 2014 – 39, 2015

SUMMARY:

The 2014–15 influenza season began on MMWR week 40 (September 28, 2014) and ended week 39 (October 3, 2015). This was a moderate season when looking at the percentage of positive specimens, influenza-like illness (ILI) rate, pneumonia and influenza (P&I) mortality, few pediatric deaths, and in comparison to baseline and historic levels.

The proportion of outpatient visits for ILI recorded by sentinel providers in Hawaii ranged during the season from 0.5% to 8.2%. The data did not show a clear trend throughout the season, although weeks 53–15 had the highest ILI rates, with a peak in visits at week 4 (8.2%). The cumulative median for the season was 1.3%. The reported ILI rates were most pronounced in the 5–24 year-old age group, which comprised 50% of all ILI visits. There were 34 ILI clusters during the year, which was more than in the previous year (28). Of those 34, 32 clusters were influenza positive.

Laboratory data showed that 7,843 (16.3%) of the 48,043 specimens tested for influenza were positive by any method (rapid antigen testing, PCR, and/or viral culture). Rapid antigen testing was performed on 27,756 (57.8%) samples, while confirmatory testing was done on 20,287 (42.2%). Of those specimens that tested positive, 6,578 were A (13.7%) and 1,265 were B (2.6%). The 6,578 influenza A specimens included 23 2009 H1N1 specimens and 1,421 H3 specimens. The remainder (5,134) were un-subtyped influenza A. When looking at age groups, the >65 year-old age group made up the largest proportion of specimens tested for influenza (26%), and 5–24 year-old age group made up the largest proportion of positive influenza tests (28%).

Pneumonia and influenza (P&I) mortality surveillance monitors the proportion of all reported deaths related to pneumonia and influenza. The Honolulu P&I contributes to a measure of P&I in 122 cities across America. There were 4,262 total deaths recorded in Hawaii for the 2014-15 influenza season. Of these deaths, 486 (11.4%) were related to pneumonia or influenza. There were a total of 146 influenza-associated pediatric deaths reported nationally to CDC during the 2014–2015 season, 1 of which occurred in Hawaii.

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 1 for interpretation of MMWR weeks.

I. INFLUENZA LIKE ILLNESS (ILI):

Influenza-like illness surveillance is a primary method used for monitoring influenza activity during the season. The data used to determine the ILI rate in Hawaii originates from sentinel healthcare providers. Each year, sentinel providers register to report ILI data to the Hawaii Department of Health (HDOH) and CDC. A patient with ILI must have the following: fever (temp. of 100°F [37.8°C] or greater) and cough and/or sore throat without a known cause other than influenza. For the 2014–2015 influenza season, 54 sentinel providers registered for the ILINet surveillance program. The distribution of providers by practice type is shown below (Table 1). Internal medicine was the most common practice type, followed by family practice and pediatrics. Student health (2), urgent care (2), and emergency medicine (1) had the lowest representation.

TYPE OF PRACTICE	# OF SENTINEL PROVIDERS
Emergency medicine	1
Urgent Care	2
Internal medicine	27
Student health	2
Pediatrician	8
Family practice	14

Table 1. Practice type distribution of the 54 Hawaii ILI sentinel providers registered for the 2014–2015 season

The geographic representation was not equally distributed among the various counties; the most populous county, Honolulu, had the highest number of sentinel providers. Of the 54 total providers, 45 were located in either Hawaii or Honolulu counties. Maui (7) and Kauai (2) had the fewest sentinel providers. CDC recommends that smaller states maintain at least 10 ILI sentinel providers per state.

LOCATION	# OF SENTINEL PROVIDERS	SENTINEL PROVIDERS PER 100,000 RESIDENTS
Hawaii	12	6
Honolulu	33	3
Kauai	2	3
Maui	7	4
Total	54	16

Table 2. Geographic distribution of the 54 Hawaii ILI sentinel providers, by county

During the 2014-2015 influenza season, sentinel providers reported a total of 84,404 patient visits (an average of 1,593 per week). Of these total patient visits, 1,999 (2.4%) were for ILI, with an average of 38 per week. Weeks 53–15 had the highest ILI rates, with a peak of 8.2% occurring in week 4. For the majority (85%) of the 2014–2015 season, the weekly proportion of outpatient visits for ILI were statistically comparable to the historical baseline² for Hawaii and the national ILI rate for that week, but lower than the national ILI baseline³ set by CDC (Figure 1). The national ILI rate appeared to peak in weeks 50–7, which was earlier than the peak seen in Hawaii.

² The Hawaii historical baseline (%ILI and %P&I) is the average of 3-week moving averages over the preceding five flu seasons of historical data (2008–09, 2009–10, 2010–2011, 2011–2012, and 2012–2013).

³ 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.

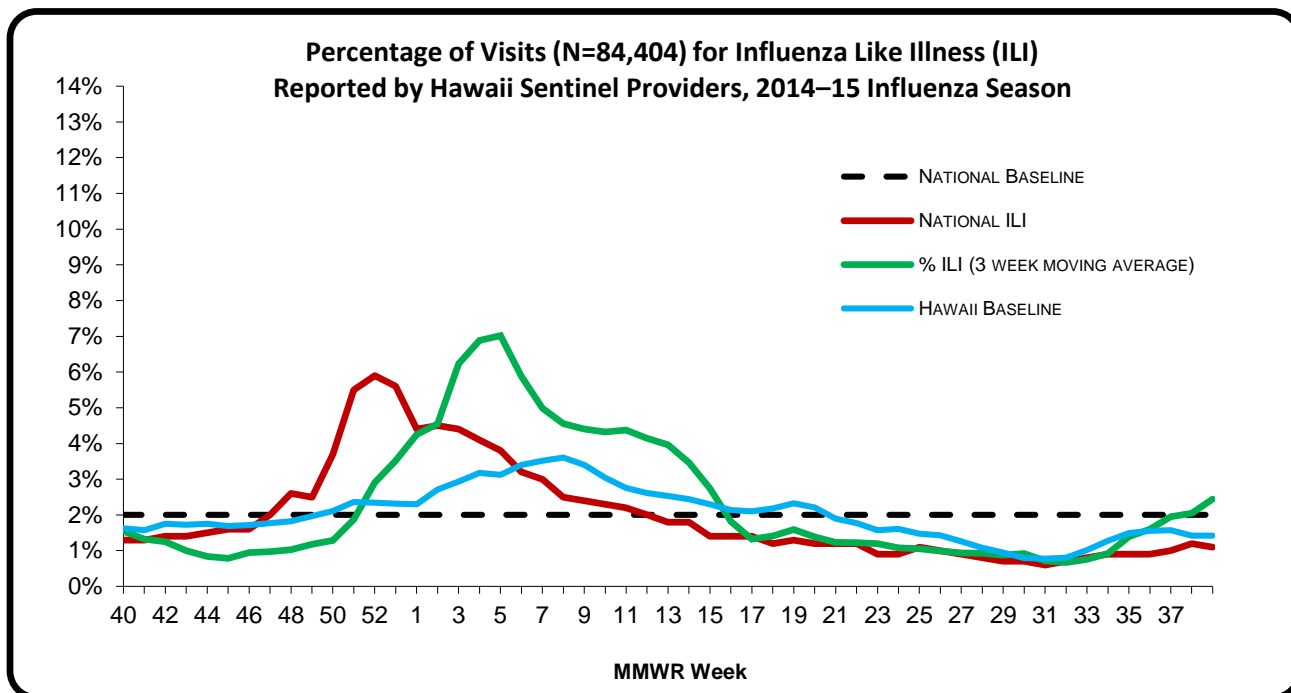


Figure 1. Comparison of the weekly Hawaii ILI rate, national baseline, national ILI rate, and Hawaii baseline by MMWR week, 2014-2015

The age group distribution of recorded ILI patients can be seen in Figure 2. About half of all reported ILI patients were in the 5-24 year-old age group. Differences in distribution by age group may not only reflect differences in infection rates, but may also be impacted by the practice types of the sentinel providers in our surveillance program as well as differential care-seeking behaviors in different age groups. About 5% of reported ILI patients were in the >65 age group. However, this population may be seen by non-sentinel providers (e.g., nursing home providers) or because of age and comorbidities may have more severe presentations meriting emergency room care.

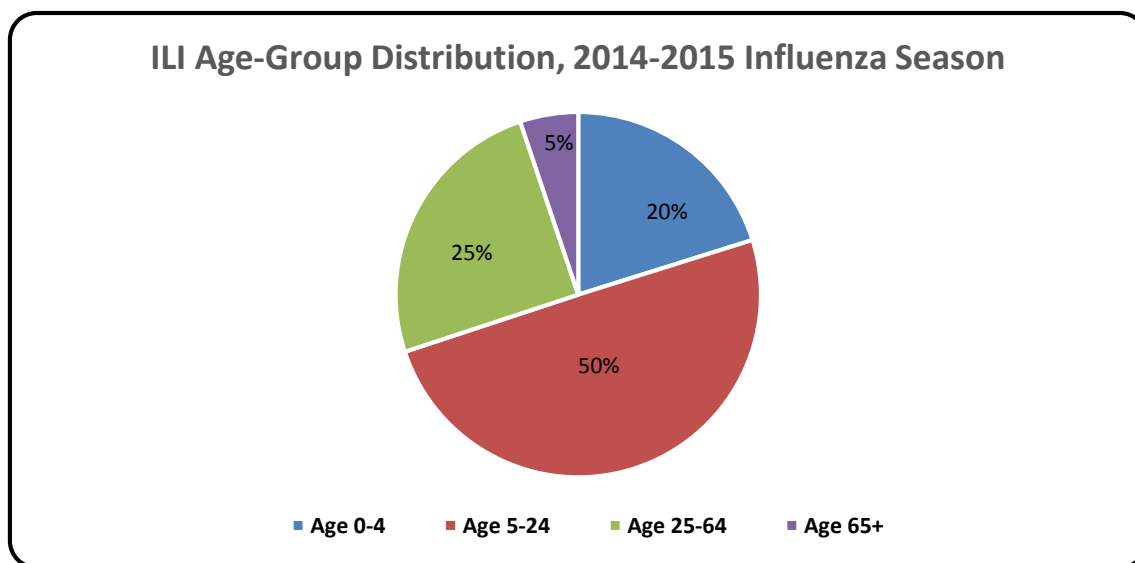


Figure 2. Age-group distribution of ILI visits for the 2014-2015 influenza season

There were 34 ILI or confirmed influenza clusters reported during the 2014–2015 season. The clusters were all associated with nursing homes (22), schools (9), or hospitals (3). Typing of clusters, where known, can be seen in Figure 3. There was a peak of unrelated clusters (18) in January. Most clusters occurred between December and February (82.4%).

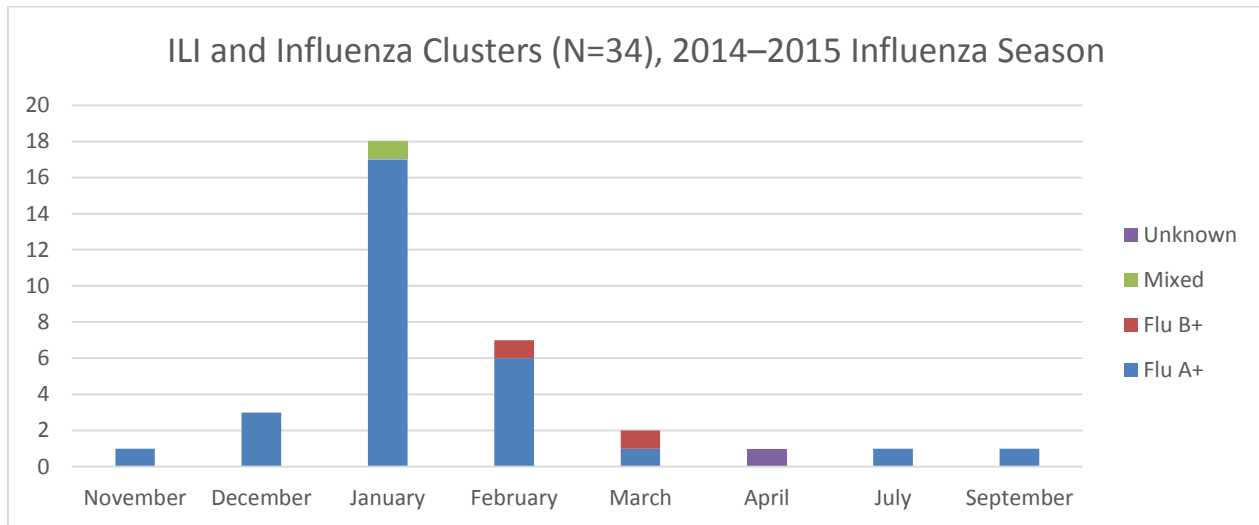


Figure 3. ILI and influenza clusters, by influenza type and MMWR week, for the 2014–2015 season

II. PNEUMONIA & INFLUENZA MORTALITY:

Pneumonia and influenza-related mortality is another method used to track influenza activity during the season. The data for pneumonia and influenza mortality comes from the Office of Vital Statistics at HDOH. The P&I rate is calculated by dividing the number of deaths related to P&I by the number of deaths from any cause.

Category	Number
Total deaths (all causes)	4,262
<i>Average/week</i>	<i>80.4</i>
Total deaths related to pneumonia/influenza	486
<i>Average/week</i>	<i>9.2</i>
Cumulative average P&I rate	11.4%
Peak P&I rate	21.0% (week 29)

Table 3. Pneumonia and influenza mortality statistics for the 2014–2015 influenza season

The figure below (Figure 4) depicts the trends for the Honolulu P&I mortality alongside three additional measures: a Honolulu historic baseline⁴, an epidemic threshold, and the 122-cities mortality rate⁵. The peak for the Honolulu P&I rate occurred in week 29 (21.0%).

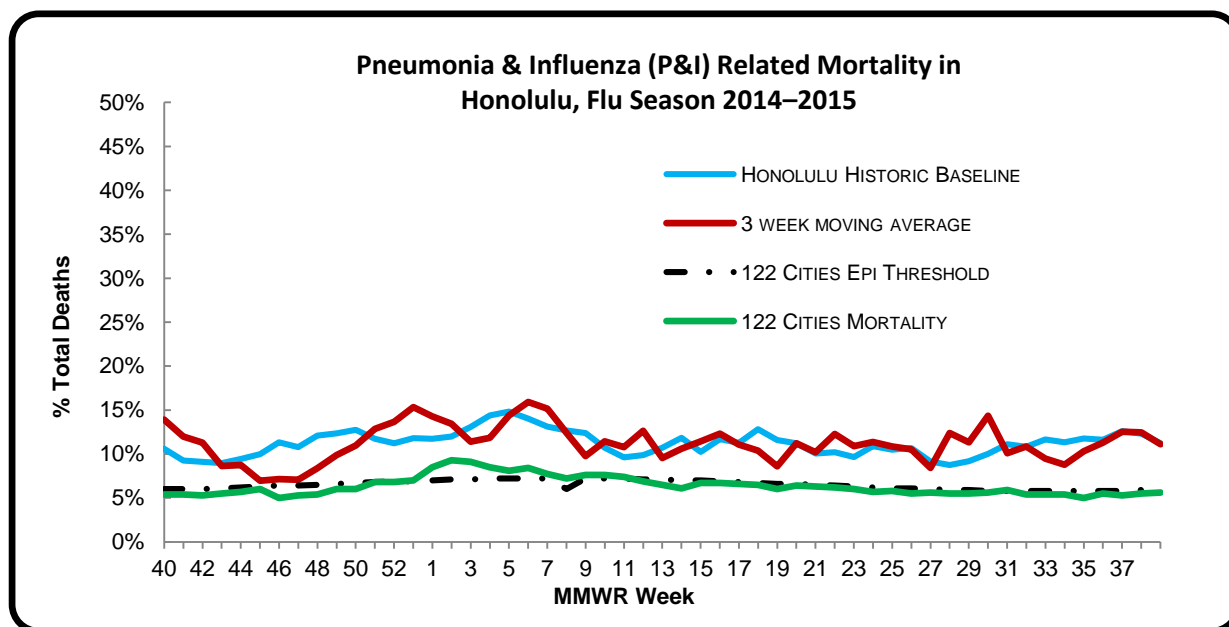


Figure 4. Pneumonia and influenza (P&I) related mortality in Honolulu by MMWR week for the 2014–15 influenza season

Additionally, influenza-associated pediatric deaths have been a nationally notifiable condition since 2004. There were a total of 146 influenza-associated pediatric deaths reported nationally to CDC during the 2014–2015 season, 1 of which occurred in Hawaii.⁶

⁴ The Hawaii historical baseline (%ILI and %P&I) is the average of 3-week moving averages over the preceding five flu seasons of historical data (2009–09, 2009–2010, 2010–2011, 2011–2012, and 2012–2013).

⁵ Each week, the vital statistics offices of 122 cities across the United States report the total number of death certificates processed and the number of those for which pneumonia or influenza was listed as the underlying or contributing cause of death by age group (Under 28 days, 28 days–1 year, 1–14 years, 15–24 years, 25–44 years, 45–64 years, 65–74 years, 75–84 years, and ≥85 years). The percentage of deaths related to pneumonia and influenza (P&I) are compared with a seasonal baseline and epidemic threshold value calculated for each week

⁶ FluView, accessed 10/28/2015: <http://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html>

III. LABORATORY SURVEILLANCE:

During the 2014–15 influenza season, the State Laboratories Division (SLD) of the Hawaii Department of Health (HDOH) received 36,132 specimens for influenza testing. Specimen submissions have steadily increased over the past several years, and an algorithm was developed to accommodate the high specimen volume, reduce turnaround time, optimize data quality, and improve utilization of limited resources. DOCD drafted a list with criteria⁷ to prioritize specimens for testing at SLD. Within the constraints of resources and funding, specimens meeting these criteria were forwarded to SLD for confirmatory testing.

TOTAL SPECIMENS TESTED FROM ALL LABORATORIES: 48,043			
SPECIMENS TESTING POSITIVE: 7,843 (16.3%)			
TESTING TYPE	RAPID ANTIGEN ONLY	27,756	57.8%
	CONFIRMATORY	20,287	42.2%
INFLUENZA TYPING	A	6,578	13.7%
	B	1,265	2.6%
INFLUENZA A SUB-TYPING	2009 H1N1	23	0.3%
	OTHER SEASONAL A (H1)	0	0%
	INFLUENZA A (H3)	1,421	21.6%
	UN-SUBTYPED A	5,134	78.0%

Table 4. Testing, typing and subtyping for influenza during the 2014–2015 season

The distribution by age group for the specimens tested and positive specimens is shown below (Figure 6). For the 48,043 specimens tested, the distribution by age group was fairly uniform, although the over 65 year-old age group represented the highest proportion (26%). The 5–24 age group made up the largest proportion of positive influenza specimens (28%).

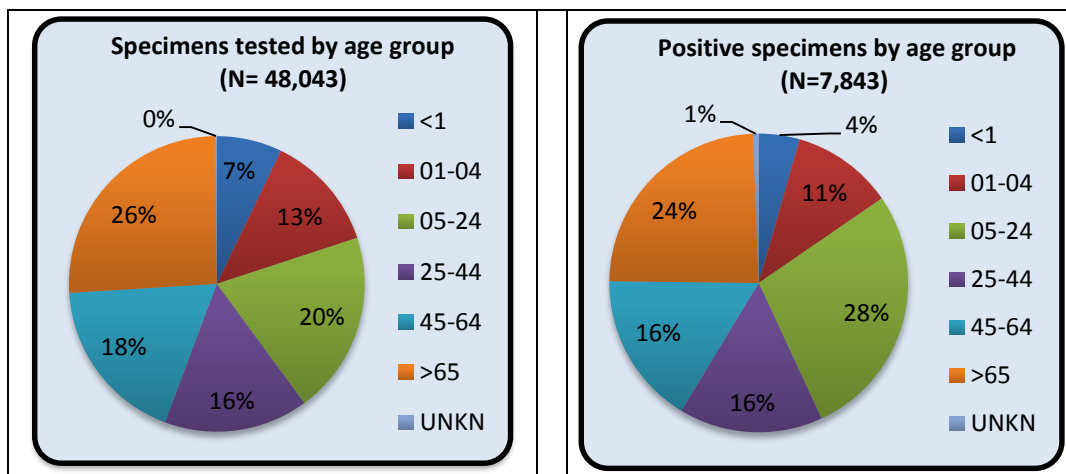


Figure 5. Age group distribution of influenza specimens tested and positive cases during the 2014–2015 season

⁷ The list of priority specimens includes: 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.

IV. AIRPORT SURVEILLANCE:

HDOH introduced passive airport influenza surveillance in collaboration with CDC's Honolulu International Airport Quarantine Station and Honolulu International Airport Medical Staff during the 2005–06 influenza season. Travelers meeting clinical criteria⁸ were swabbed at the airport, and specimens were tested at SLD by RT-PCR for influenza as well as for other respiratory viruses via a Luminex xTAG respiratory virus panel (Luminex Corporation, Austin, TX). During the 2014–2015 season, a total of 3 air travelers⁹ meeting clinical criteria were swabbed and tested. Of these, one was positive for influenza A(H3), one was positive for parainfluenza type 3, and the last specimen was negative for influenza or other respiratory pathogens.

V. AVIAN INFLUENZA:

No cases of avian influenza infection in humans were identified in the United States during the 2014-2015 flu season. As of the end of the 2014–15 influenza season, human cases of avian influenza A (H5N1) have been detected in 16 countries since surveillance began in 2003. A total of 844 cases and 449 deaths have been identified globally; the countries with the highest numbers of cases were Indonesia, Vietnam, Egypt, China, and Thailand. These five countries represented 427 (50.6%) of the total cases and 260 (57.9%) of the total deaths. Of all patients who became ill with WHO-confirmed avian influenza through the end of the 2014–2015 season, 42 (29.4%) died.

Country	2003-2009*		2010		2011		2012		2013		2014		2015		Total	
	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	8	5
Bangladesh	1	0	0	0	2	0	3	0	1	1	0	0	0	0	7	1
Cambodia	9	7	1	1	8	8	3	3	26	14	9	4	0	0	56	37
Canada	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
China	38	25	2	1	1	1	2	1	2	2	2	0	5	1	52	31
Djibouti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Egypt	90	27	29	13	39	15	11	5	4	3	37	14	136	39	346	116
Indonesia	162	134	9	7	12	10	9	9	3	3	2	2	2	2	199	167
Iraq	3	2	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Myanmar	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Nigeria	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Pakistan	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	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	0	0	0	0	12	4
Viet Nam	112	57	7	2	0	0	4	2	2	1	2	2	0	0	127	64
Total	468	282	48	24	62	34	32	20	39	25	52	22	143	42	844	449

Table 5. Laboratory-confirmed avian influenza cases, by year and county, as reported to the World Health Organization, 2003–2015¹⁰

⁸ Clinical criteria were defined as a fever or history of fever (i.e., body temperature 100°F or greater) plus one or more of the following symptoms: headache, muscle aches, sore throat, cough, chills, malaise, and/or vomiting.

⁹ Denominator data are currently unavailable.

¹⁰ WHO, accessed on 10/28/2015: http://www.who.int/influenza/human_animal_interface/EN_GIP_20150904cumulativeNumberH5N1cases.pdf?ua=1

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: http://www.cdc.gov/flu/about/disease/index.htm National ILI and P&I Data: http://www.cdc.gov/flu/weekly/fluactivitysurv.htm Vaccine Virus Selection: http://www.cdc.gov/flu/about/season/vaccine-selection.htm
Flu.gov	General Influenza Information: flu.gov
HDOH Flu and Pneumonia	General Influenza: http://health.hawaii.gov/docd/flu-hawaii/general-info/ Surveillance: http://health.hawaii.gov/docd/flu-hawaii/surveillance/ To find out more information or join the sentinel physician program, email: arielle.colon@doh.hawaii.gov
World Health Organization	General Global and Local Influenza: http://www.who.int/topics/influenza/en/ Avian Influenza: http://www.who.int/influenza/human_animal_interface/avian_influenza/en/

APPENDIX 2: MMWR WEEK

Please refer to the table below to interpret data presented by MMWR week.

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