INFLUENZA WATCH
Influenza and Related Disease Updates for Los Angeles County

Season Summary
August 2015
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2014-2015 Influenza Season Summary

The 2014-2015 influenza season in Los Angeles County (LAC) was mild to moderate, with fewer fatal cases reported but higher activity measured by other surveillance indicators compared to last season. Influenza A (H3N2) was the dominant strain, with a subsequent increase in influenza B activity which commonly peaks later in the season (Figure 1). A total of 54 influenza-associated deaths (51 adult, 3 pediatric) were reported this season, with the majority of fatalities occurring in the 65 years and older age group (N=39, 72.2%) which is consistent with other A (H3N2) predominant seasons. Overall peak activity occurred during mid-January, which is common for LAC but late compared to the rest of the country which peaked in late December. Influenza activity remained elevated longer than usual, continuing well into May, primarily attributable to type B. Although influenza activity varies from season-to-season, activity usually returns to baseline levels by March-April.

Both locally and nationally, influenza A (H3N2) was the dominant strain and the majority of these viruses were different than the one included in the 2014-2015 seasonal vaccine. The 2014-2015 seasonal vaccine was not a good match to the dominant circulating strain and vaccine efficacy (VE) against A (H3N2) viruses was estimated at 18% (95% confidence interval (CI): 6%-29%); however, VE against influenza B was estimated at 45% (95% CI: 14%-65%) (1). This year's long flu B season emphasizes the importance of vaccinating throughout the winter and into spring. The influenza A (H1N1) pandemic strain was detected at the lowest levels since its emergence in 2009 (<1% of all subtyped influenza A) (2).

[1]CDC Presents Updated Estimates of Flu Vaccine Effectiveness for the 2014-2015 Season | News (Flu) | CDC
[2]Situation Update: Summary of Weekly FluView | Seasonal Influenza (Flu) | CDC

Figure 1. Weekly Influenza Positive Tests from Sentinel Laboratories, LAC, 2014-2015

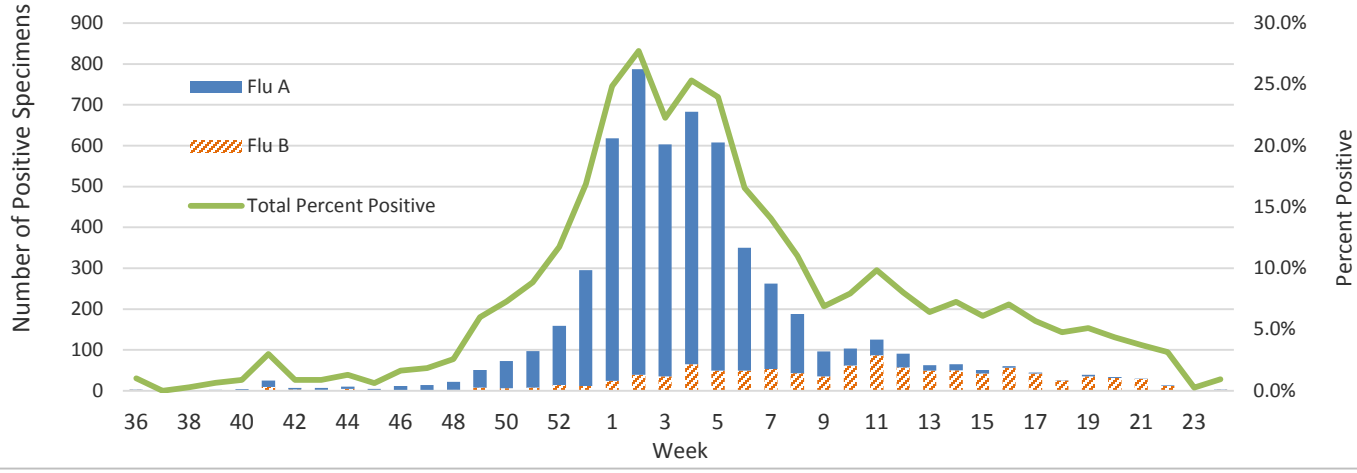

Table 1. LAC 2014-2015 Influenza Season Summary

	Peak Week 2 1/11/-1/17/15	2014-15 Season 9/1/14-8/8/15
Positive Flu Tests/Total Tests† (Percent Positive Flu Tests)	787/2,839 (27.7%)	5,752/48,405 (11.9%)
Percent Flu A/B	95/5	81/19
Respiratory outbreaks –Unk Etiology	2	21
Influenza confirmed outbreaks††	8	37
Total Community Respiratory Outbreaks	**10**	**58**
Pediatric Flu Deaths	1	3
Adult Flu Deaths, confirmed†††	8	51
Total Flu Deaths*	**9**	**54**

†Sentinel sites (8 participating) ††Associated with at least one positive influenza lab test
†††Confirmed influenza death is defined by a positive lab test, ILI symptoms, and clear progression from illness to death *Flu deaths peaked week 3
Note: LA County tracks flu deaths of all ages, CA State reports on those <65 years only

Figure 2. Proportion of Respiratory Illness Emergency Department Visits by Week, LAC, 2009-2015

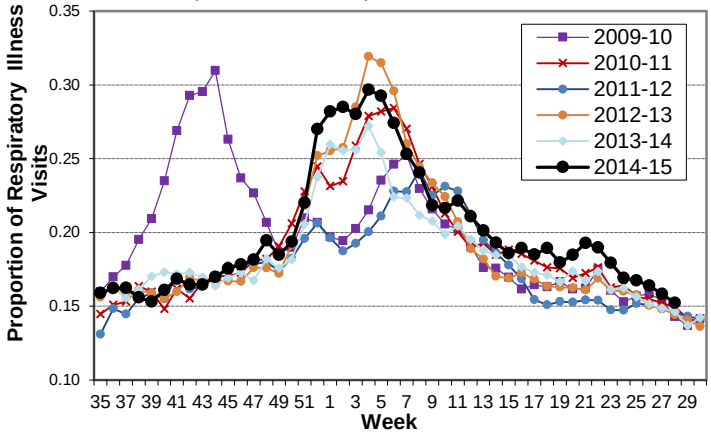

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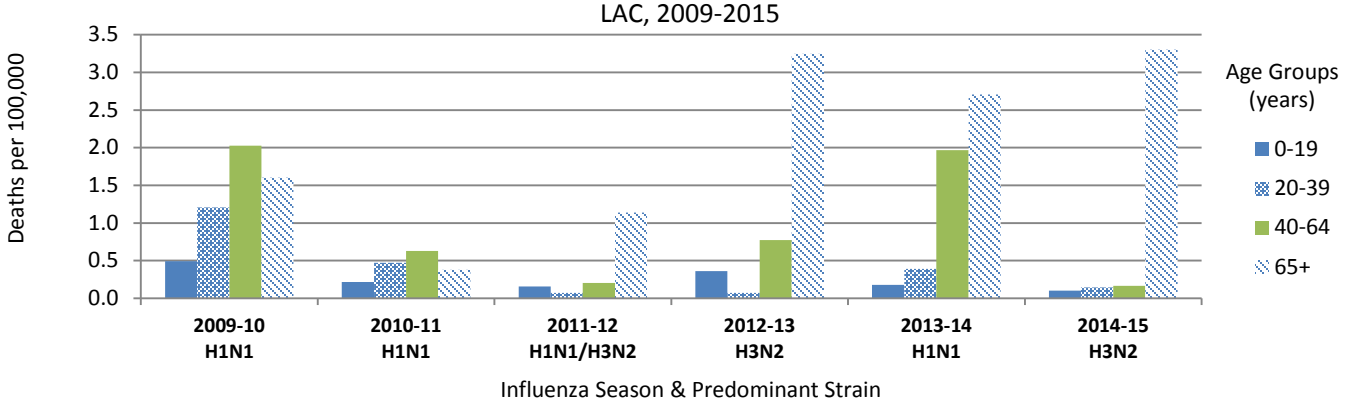
Figure 2. Age-Specific Rates of Influenza-Associated Deaths by Season, LAC, 2009-2015



Influenza-Associated Deaths

A total of 54 influenza-associated deaths (IADs) were reported and confirmed by LAC Department of Public Health (DPH) during the 2014-2015 season (September 2014-June 2015). Three pediatric deaths were reported this season in LAC; one child did not receive this season's influenza vaccination and the other two had unknown vaccination status; one of whom was immunocompromised. This highlights the importance of herd immunity which protects those who cannot be vaccinated, or would not respond to vaccine. The majority of deaths this season occurred in those 65 years and older, which is consistent with other A (H3N2) dominant seasons that disproportionately burden the elderly population. Figure 2 compares the distribution of IADs by age-specific rates across the past 6 influenza seasons. During A (H3N2) seasons, IAD rates in the 65+ age group are consistently and substantially higher than in other age groups.

Table 2. Demographic Characteristics of Influenza Fatalities LAC 2009-2015

		2014-15 N (%)	2013-14 N(%)	2012-13 N (%)	2011-12 N (%)	2010-11 N (%)	2009-10† N (%)
Age (years)	Median	**82**	56	68	64	45	48
	Range	**1-101**	0-89	0-100	0-104	0-92	0-94
	0-5	**1 (2)**	1 (1)	5 (7)	2 (8)	4 (9)	3 (2)
	6-17	**2 (4)**	3 (3)	3 (4)	2 (8)	2 (5)	10 (8)
	18-40	**5 (9)**	13 (12)	4 (6)	2 (8)	14 (33)	37 (29)
	41-64	**7 (13)**	59 (56)	22 (31)	6 (25)	19 (44)	60 (47)
	65+	**39 (72)**	30 (28)	36 (52)	12 (50)	4 (9)	17 (13)
Gender	Male	**29 (54)**	67 (64)	35 (50)	10 (42)	20 (47)	57 (45)
	Female	**25 (46)**	38 (36)	35 (50)	14 (58)	23 (53)	70 (55)
Race	Hispanic	**17**	48 (46)	29 (42)	12 (50)	26 (60)	56 (49)
	White Non-Hispanic	**25**	41 (39)	25 (37)	5 (21)	9 (21)	39 (34)
	Black	**4**	9 (8)	8 (12)	4 (17)	4 (9)	11 (9)
	Asian/Pacifc Islander	**8**	7 (7)	6 (9)	3 (12)	4 (9)	9 (8)
Total Fatalities		**54**	**105**	**70**	**24**	**43**	**127**

†2009-10 season is missing race data for n=12

Table 3. Top 10 Underlying Medical Conditions, Adult Influenza Fatalities LAC 2009-2015

	2014-15* N (%)	2013-14 N (%)	2012-13 N (%)	2011-12 N (%)	2010-11 N (%)	2009-10 N (%)
Hypertension	**30 (59)**	46 (46)	32 (52)	13 (65)	17 (47)	34 (27)
Heart disease	**21 (41)**	33 (33)	23 (38)	12 (60)	6 (17)	40 (31)
Diabetes	**19 (37)**	32 (32)	19 (31)	7 (35)	10 (28)	44 (35)
Lung disease	**15 (29)**	17 (18)	11 (18)	3 (15)	6 (17)	42 (33)
Overweight or obese	**14 (27)**	40 (40)	26 (42)	9 (45)	31 (86)	69 (54)
History of tobacco use	**12 (24)**	35 (35)	8 (13)	8 (40)	9 (25)	12 (9)
Immunosuppression	**6 (12)**	19 (20)	9 (15)	7 (35)	5 (14)	30 (24)
Asthma	**6 (12)**	10 (10)	5 (8)	3 (15)	3(8)	9 (7)
History of drug or alcohol abuse	**1 (2)**	17 (17)	5 (8)	4 (20)	3 (8)	7 (5)
Pregnancy	**0**	1 (1)	0	0	1 (3)	4 (3)
Total Adult Fatalities	**51**	**101**	**62**	**20**	**37**	**114**

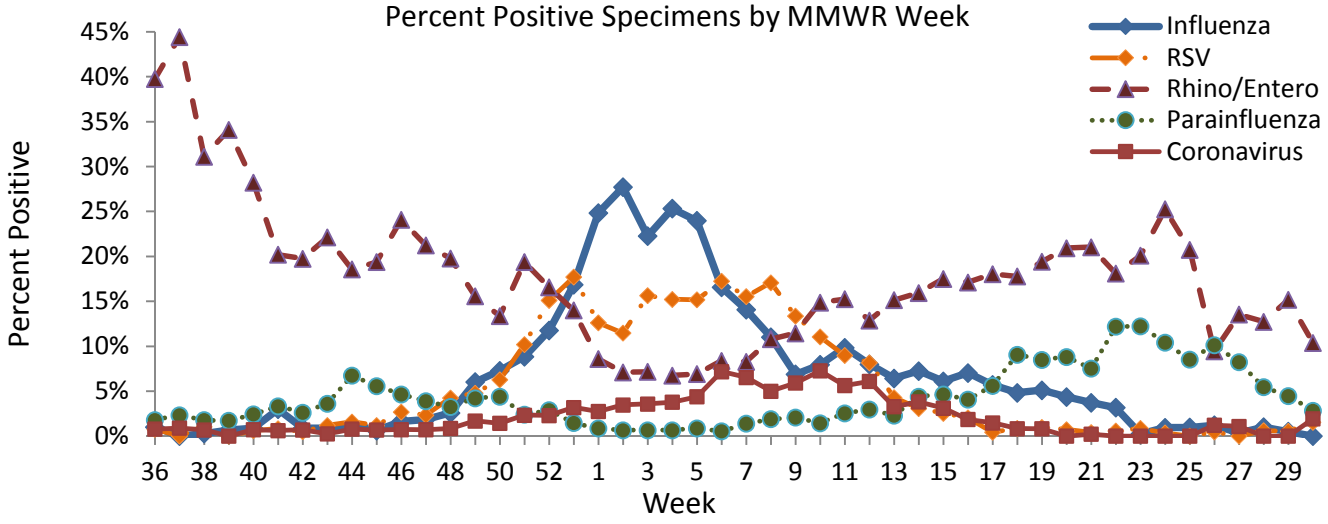
* Ordered for the 2014-15 season
† Due to overlapping conditions and complications, total will exceed 100%
‡ Data not available for all categories
††Data taken from self-reported medical records

The median age of IADs was 82 years old (range 1-101), which is much older compared to the past 5 seasons (Table 2). Over 72% of IADs in LAC occurred in the elderly population. In addition, A (H1N1), which impacts a younger demographic, circulated at extremely low levels possibly adding to the disparate impact of IADs in the 65+ age group. Similar to previous seasons, the top 3 comorbidities associated with IADs for the 2014-15 season were hypertension, heart disease, and diabetes (Table 3). Being obese or overweight had been a top risk factor since 2009, however, that comorbidity was not identified as frequently during this season; most likely because the majority of IADs were among the elderly population.

Other Respiratory Virus Activity

Along with influenza, many other respiratory viruses co-circulate during flu season and contribute to respiratory illness. Eight LAC sentinel laboratories participate in respiratory virus surveillance and report weekly data on respiratory viral testing (Figure 3). In addition to influenza, some sites also submit test results for respiratory syncytial virus (RSV), rhinovirus/enterovirus, adenovirus, coronavirus, human metapneumovirus, and parainfluenza. Many of these viruses produce symptoms that are similar to those caused by influenza, such as cough, fever, and rhinorrhea. Of special note, as of Dec 2014, severe cases of RSV in children <5 years old became reportable in LAC. A total of 159 severe cases were identified in LAC including one fatality.

Figure 3. Respiratory Viruses, LAC, 2014-15
Percent Positive Specimens by MMWR Week



During the summer of 2014, an outbreak of enterovirus (EV-D68) in the Midwest gained national attention resulting in enhanced surveillance of respiratory illness, particularly in children, and clusters of respiratory illness where enterovirus was identified. Sporadic cases of EV-D68 were identified in LAC, but were not associated with any outbreaks or clusters of illness.

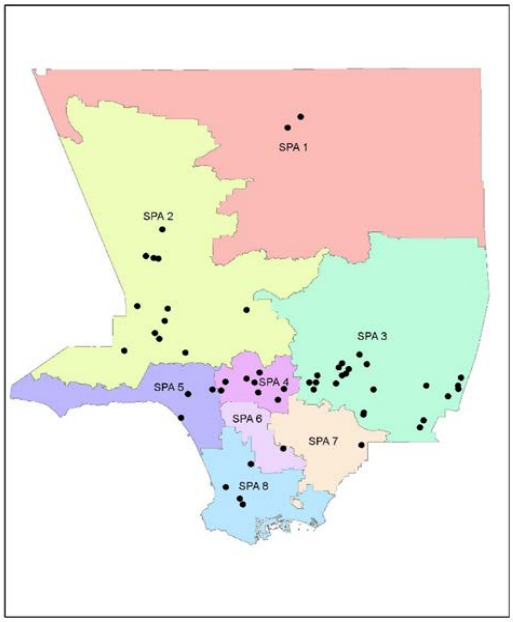
Middle East Respiratory Syndrome (MERS-CoV) emerged in the Middle East in 2012 and continues to cause outbreaks in that region, and more recently, in South Korea. In May 2014, two unrelated, travel-associated cases of MERS were identified in the United States. No secondary transmission was documented and both cases recovered. To date, no cases have been identified in LAC.

Table 4. Characteristics of Confirmed Community Respiratory Outbreaks LAC, 2009-2015

	2014-15 N (%)	2013-14 N (%)	2012-13 N (%)	2011-12 N (%)	2010-11 N (%)	2009-10 N (%)
Total	**61**	**29**	**73**	**39**	**60**	**436**
Location						
Skilled Nursing Facility (SNF)	**28 (46)**	12 (41)	23 (32)	12 (31)	7 (12)	25 (6)
School or Pre-School	**20 (33)**	11 (38)	41 (56)	22 (56)	46 (77)	376 (86)
Assisted Living	**12 (20)**	3 (10)	6 (8)	2 (5)	3 (5)	20 (5)
Daycare/child care	**1 (2)**	1 (3)	3 (4)	3 (8)	3 (5)	6 (1)
Other	**0**	2† (7)	0	0	1 (1)	9 (2)
Etiology						
Influenza††	**40 (66)**	7 (24)	17 (23)	6 (15)	18 (30)	74 (17)
Other Respiratory	**1* (2)**	0	1 (1)	7 (18)	4 (7)	0
Respiratory unknown etiology	**20 (32)**	22 (76)	55 (76)	26 (67)	38 (63)	362 (83)

†Home for pregnant women and children ††Confirmed influenza outbreaks must include at least 1 positive lab test
*Both influenza and strep were detected in one outbreak

Figure 5. Community Respiratory Outbreaks by Service Planning Area, LAC, 2014-2015



Respiratory Outbreaks

There were a substantial increase in respiratory outbreaks reported and investigated during the 2014-2015 season. The most outbreaks were reported during surveillance week 2 (January 11-17, 2015). A total of 58 respiratory outbreaks were investigated and determined to be actual outbreaks; of those, 37 were confirmed influenza and 21 were classified as general respiratory outbreaks with no known etiology. The majority of outbreaks with unknown etiology are due to the absence of specimen collection and laboratory testing. Early identification of respiratory outbreak etiology is critical in providing appropriate treatment and prophylaxis. When influenza is indicated, antiviral medication is available and is most effective when administered as early as possible after symptom onset. Respiratory outbreak definitions vary by setting, however in general, clusters of ILI (fever >100° F with cough and/or sore throat) is cause for investigation.

A total of 33 respiratory outbreaks were confirmed in schools, daycare, and assisted living facilities. Of those, a positive influenza lab result was identified in 18 outbreaks. In skilled nursing facilities, 25 total respiratory outbreaks were confirmed, with 19 attributed to influenza and 6 with unknown etiology. There was a substantial increase in reported respiratory outbreaks in all settings compared to last season for unknown reasons (Table 4). Respiratory outbreaks from all community locations were geographically distributed across LAC (Figure 5).

2015-2016 Season Vaccine

The Food and Drug Administration (FDA) endorsed the recommendations by the World Health Organization (WHO) for the composition of the 2015-2016 seasonal influenza vaccine in the northern hemisphere.

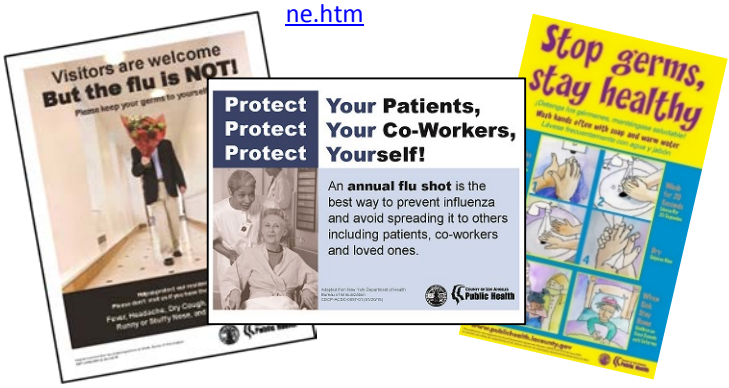
- A/California/7/2009 (H1N1) pdm09-like virus;
- A/Switzerland/9715293/2013 (H3N2)-like virus;
- B/Phuket/3073/2013-like virus.

The quadrivalent formulation will contain the above three viruses and an additional B/Brisbane/60/2008-like virus. The H1N1-like and B/Brisbane (quadrivalent only) components are the same as the 2014-2015 seasonal vaccine, however the A/Switzerland H3N2-like and B/Phuket-like viruses are new for next season.

In addition, for the upcoming 2015-2016 season, the Advisory Committee on Immunization Practices (ACIP) continues to recommend influenza vaccination for everyone 6 months and older. However, for children 2-8 years old, there is no preference for the nasal spray live attenuated influenza vaccine (LAIV) over the inactivated influenza vaccine (IIV), which was recommended over the IIV shot during the 2014-2015 season.

For more information, see:
Advisory Committee on Immunization Practices (ACIP) reaffirms recommendation for annual influenza vaccination | CDC Online Newsroom | CDC

Prepare for Influenza Season with Health Education Materials available at:
http://publichealth.lacounty.gov/acd/HealthEdFlu.htm
http://publichealth.lacounty.gov/acd/respiratoryhygiene.htm



Mandatory Flu Vaccination for Healthcare Personnel in LAC

On October 23, 2013, the LAC Health Officer issued a health order mandating all healthcare personnel receive the flu vaccine each season until rescinded. This order applies to all persons in healthcare facilities including paid and unpaid employees, contractors, students, and volunteers, from November 1-March 31 annually. For more information see:

http://www.publichealth.lacounty.gov/ip/Docs/HealthOfficerOrder_10-7-13.pdf

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